

## Poster Abstracts

Topic: Aetiology and pathogenesis

P0001

### A Retrospective Analysis of the Etiology of Peri-Implantitis and Implant Failure

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**Aim:** Peri-implantitis, a serious complication of implant dentistry, poses a challenging problem for the clinician. A major issue for the near future is the growing incidence of peri-implantitis. Published studies suggest 25-53% of patients with implants have peri-implantitis. Peri-implantitis is a multifactorial disease with the etiology sharing many similarities with periodontitis including the need for maintenance for disease prevention. By developing a protocol to identify and predictably treat patients with peri-implant mucositis and implantitis, the patient benefits from improved peri-implant health.

**Material and Methods:** As a referral center for patients with implant complications, we have developed a protocol and algorithm for the identification of peri-implant diseases as well the treatment of peri-implant mucositis and implantitis. A retrospective analysis of 25 consecutive patients with peri-implantitis was undertaken. Patients were followed on average for 8.5 years.

**Results:** The etiology of peri-implantitis cases was determined to be ineffective cement or calculus removal in 36% of patients. Open contacts and incomplete seating of the crown resulted in osteitis around the implant in 54% of cases. Moreover, a reported allergy to penicillin was associated with 56% of overt implant failures.

**Conclusion:** Two factors under the control of the clinician - ineffective implant maintenance and the incomplete removal of cement at the time of crown cementation - are positively associated with peri-implantitis. A correlation of a penicillin allergy with implant failure may suggest a link with the innate osteoimmunity of the patient.

Topic: Aetiology and pathogenesis

P0002

### Genome comparison of clinical virulent *Porphyromonas gingivalis* strains PGC1 and TDC60 with type strains W83 and ATCC 33277

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**Aim:** *Porphyromonas gingivalis* is a major pathogen of chronic periodontitis. In mouse abscess model, *P. gingivalis* strains show virulent and less-virulent properties. Two widely studied type strains of *P. gingivalis*, virulent strain W83 and less-virulent strain ATCC 33277, have been genome-sequenced in 2003

and 2008, respectively. Recently, a clinical strain TDC60 was isolated and genome-sequenced in Japan. The aim of this study was to compare the genomic sequence of clinical virulent *P. gingivalis* strains PGC1 and TDC60 with type strains W83 and ATCC 33277.

**Material and Methods:** In this study, *P. gingivalis* strain PGC1 was isolated from subgingival plaque of a patient with severe chronic periodontitis and identified with 16s rDNA sequencing. The virulent properties of the PGC1 was analyzed with a mouse subcutaneous soft tissue abscess model. Draft genome of *P. gingivalis* PGC1 was sequenced by high-throughput Solexa sequence analyzer. Finally, the protein-coding sequences (CDSs) of PGC1 was compared with those of TDC60, W83, and ATCC 33277.

**Results:** In the animal model, strain PGC1 showed typical virulent properties, which are comparable with strain W83. In the genomic analysis, 2,111 CDSs were predicted. Further genomic comparison revealed the number and function categories of genes unique, shared, or core between the strains PGC1, TDC60, W83, and ATCC 33277.

**Conclusion:** This study provides new insight in virulence study of *P. gingivalis*.

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P0004

### Gingival crevicular fluid levels of interleukin-33 (IL-33), thymic stromal lymphopoietin (TSLP), interferon- $\gamma$ (IFN- $\gamma$ ), and interleukin-4 (IL-4) in periodontal health and disease.

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**Aim:** Interleukin-33 (IL-33) and thymic stromal lymphopoietin (TSLP) are novel cytokines, highly involved in the immunoregulation of several inflammatory diseases. The goals of this study are to investigate the presence and levels of IL-33 and TSLP, as well as IFN- $\gamma$  and IL-4 in gingival crevicular fluid (GCF) in periodontal health and disease.

**Material and Methods:** Periodontally healthy (n=14), gingivitis (n=17) and periodontitis (n=11) subjects were recruited. Clinical data performed and GCF samples were collected from healthy (H), gingivitis (G) and periodontitis (P) sites in each subject category (i.e., PH, PG, PP in periodontitis subjects; GH, GG in gingivitis subjects and HH in healthy subjects). IFN- $\gamma$ , IL-4, IL-33, and TSLP levels were evaluated using a multiplex bead immunoassay (Luminex). Differences between and within groups were sought using the Mann Whitney and Wilcoxon tests, respectively.

**Results:** Inflamed sites in gingivitis and periodontitis patients showed higher GCF volume than non-inflamed sites in all patient categories (p<0.0001). IFN- $\gamma$  was detected in 50% of the

GCF samples, reaching the highest levels in inflamed sites in gingivitis (0.27 pg/site) and periodontitis (0.31 pg/site) patients. A very low number of the GCF samples showed detectable levels for IL-4 (4%) and TSPL (3%), while IL-33 was below the detection level in all samples.

**Conclusion:** Although the infrequent detection of IL-33 and TSLP in GCF suggests that these cytokines might not be involved in periodontal diseases, they might exist in periodontal tissues, but do not reach the crevicular area in measurable amounts.

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## P0005

### GINGIVAL CREVICULAR FLUID PROTEINASE 3 LEVELS IN DIFFERENT PERIODONTAL DISEASES

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**Aim:** Proteinase 3 has many biological activities, including the degradation of extracellular matrix proteins and antibacterial activity by releasing mature antimicrobial peptides. Antimicrobial peptides participating in the innate host response are important contributors for maintaining the balance between health and disease. The aim of the present study was to investigate gingival crevicular fluid (GCF) proteinase 3 levels in different periodontal diseases.

**Material and Methods:** A total of 76 subjects including 18 chronic periodontitis (CP), 20 generalized aggressive periodontitis (G-AgP), 20 gingivitis patients and 18 healthy subjects were included into the present study. Clinical periodontal parameters including probing depth, clinical attachment level, plaque index, and papilla bleeding index were assessed in all study subjects. GCF samples proteinase 3 levels were analyzed by enzyme-linked immunosorbent assay (ELISA). Statistical analyses were performed using parametric and non-parametric techniques.

**Results:** The present study demonstrated that CP, G-AgP and gingivitis groups had significantly higher GCF proteinase 3 total amount compared to healthy control group. After adjusting age, GCF proteinase 3 total amount was still significantly higher in CP, G-AgP and gingivitis groups than healthy controls ( $p < 0.05$ ). However there was no significant difference in GCF proteinase 3 concentrations among the study groups, even after adjusting age. Additionally, GCF proteinase 3 total amounts in CP and G-AgP groups were positively correlated with probing depths ( $p < 0.05$ ).

**Conclusion:** Elevated levels of GCF proteinase 3 in CP, G-AgP and gingivitis might suggest that proteinase 3 play a role during inflammatory periodontal events in host response.

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## P0006

### Gingival Tissue Alterations in Two Patients with Port Wine Stain

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**Aim:** Port-wine stain (PWS) is a capillary vascular malformation that is characterized by a pink, dark red and red-purple stain and may involve skin, soft tissue and/or bone, usually appears on the face, legs, arms, and the back of the neck. It occurs in 0.3% of the newborns and rarely involves intraoral region and in the literature, there are very limited number of reports.

**Material and Methods:** We reported two female patients with PWS. The first patient was an 11-year-old female who applied to clinic for the treatment of her unaesthetic gingival appearance, and the second was 56-year-old female who applied for dental pain. Extraorally, both patients had diffuse PWS on the right side of their face extending to the midline. While the first patient had dark red to purple flat skin and gingival lesions on her right side of both jaws and lips, the other had only her upper jaw and lip. Because of the first patient's early age, the treatment has been postponed to her 20', and the other patient didn't accept any treatment.

**Results:** Although PWS don't require treatment, if there are aesthetic concerns, pulsed-dye-laser therapy can be used for to lighten lesions. Removal of gingival pigmentation can be achieved by excision of pigmented epithelium and gingiva. The other treatment options would be chemical treatment, free gingival graft, abrasion techniques, gingivectomy, cryosurgery and lasers.

**Conclusion:** PWS is a rare and non-fatal condition; however, the unique appearance of these patients can lead to many negative psychological implications especially in their early lives.

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## P0007

### Biochemical Analysis of Pentraxin 3 Level in Experimental Periodontitis Model

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**Aim:** The acute-phase response is a nonspecific process that may occur in the initial host response to injuries, infections, ischaemic necrosis or malignancy. Pentraxin 3 (PTX3), newly discovered inflammation marker, is a member of acute phase proteins. The hypothesis, synthesis of gingival tissue and serum PTX-3 increases in the experimental periodontitis model, was tested by detecting gingival tissue and serum PTX-3 levels in rats with experimental periodontitis.

**Material and Methods:** 20 Wistar rats were divided randomly into two groups as experimental periodontitis group and control group. Sterile silk threads were ligatured around the cervical area of the right mandibular first molar in experimental periodontitis group; these were kept in position for 40 days to promote microbial dental plaque and inflammation. At the end of the experimental period, blood samples were collected from all rats. Rats were sacrificed and mandibles were removed with the surrounding gingival tissue. PTX3 levels were measured in homogenized gingival tissue and serum samples using ELISA.

**Results:** No significant difference was observed in gingival tissue and serum PTX3 levels between the two groups ( $P > 0.05$ ).

**Conclusion:** Within the limits of this study, it can be concluded that PTX3 seems not to be associated with tissue destruction in inflammatory periodontal disease.

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**P0008**

### Oral squamous carcinoma cells express B7-H1 and B7-DC in vivo

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**Aim:** B7-H1 and B7-DC receptors are members of the B7 family with important regulatory functions in cell-mediated immune response. Both receptors are ligands of the programmed death receptor PD-1. B7-H1 expression has been detected in the majority of human carcinomas in vivo. B7-H1 mediated signals are able to negatively regulate activated T cell functions and survival, and enable tumor cells to overcome host response. The aim of this study was to investigate the expression of B7-H1 and B7-DC proteins in squamous cell carcinomas in vivo.

**Material and Methods:** Tissues from 16 oral OSCC were kryo-sected and after performance of routine staining (HE) incubated with antibodies against human B7-H1 and B7-DC. Immunostaining of Pan-cytokeratin was performed to proof the epithelial origin of the tissue. The immunofluorescence was analysed using a Leica LSM DM LFS laser scanning confocal imaging system.

**Results:** B7-H1 expression was demonstrated in 15 of 16 OSCC. All 16 OSCC were positive for B7-DC expression. The B7-H1 and B7-DC protein was located in areas of the tissue that were identified as cancerous lesions in the HE stained sections before.

**Conclusion:** The in vivo expression of the B7-H1 and B7-DC receptors in oral squamous cell carcinomas was shown which facilitates immune evasion of the tumours.

Topic: Basic Research: Aetiology and Pathogenesis

**P0010**

### Effects of periodontal bacterial lysates on human monocyte-derived dendritic cells obtained from individuals with chronic periodontitis or periodontal health

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**Aim:** To investigate the effects of periodontal bacterial lysates on maturation and function of monocyte-derived dendritic cells (MDDCs) derived from individuals with chronic periodontitis (CP) or periodontal health (HP).

**Material and Methods:** MDDCs were stimulated with *Streptococcus sanguinis*, *Prevotella intermedia*, *Porphyromonas gingivalis*, or *Treponema denticola* lysates.

**Results:** Expression of HLA-DR was lower in unstimulated mature (m-)MDDC from CP ( $p=0.04$ ), while expression of CD1a and CD123 were higher in CP. The expression pattern of HLA-DR, CD11c, CD123, and CD1a did not change on bacterial stimulation, regardless of the bacteria. Stimulation with *P. intermedia* upregulated CD80 and CD86 in CP cells ( $p\leq 0.05$ ). Production of IL-12p70 by unstimulated m-MDDCs

was 5.8-fold greater in CP. Bacterial stimulation further increased IL-12p70 production while decreasing IL-10. Significantly more IFN- $\gamma$  was produced in co-cultures of CP m-MDDCs than with HP m-MDDCs when cells were stimulated with *P. intermedia* ( $p=0.009$ ).

**Conclusion:** Unstimulated m-MDDC from CP exhibited a more immature membrane phenotype but a cytokine profile biased towards hyperinflammatory response; this pattern was maintained/exacerbated after bacterial stimulation. *P. intermedia* upregulated costimulatory molecules and IFN- $\gamma$  expression in CP m-MDDC, indicating that this bacterium may be more immunogenic and then more efficiently eliminated or induce more periodontal destruction.

Topic: Basic Research: Aetiology and Pathogenesis

**P0011**

### Syndecans: a novel family expressed in gingival tissues of chronic periodontitis patients

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**Aim:** The aims of this study were to determine immunohistochemically the expression and distribution of members of the syndecan family of heparan sulfate proteoglycans in various gingival tissues/cells of chronic periodontitis patients; and to correlate the immunohistochemical expression of syndecan members with various putative parameters (environmental, patient/systemic and local parameters).

**Material and Methods:** Gingival specimens were surgically excised from the area of junctional/pocket epithelium (JE/PE; study group 1, including 30 chronic periodontitis patients) or oral gingival epithelium (OE; study group 2, comprising another 30 chronic periodontitis patients), adjacent to teeth with poor prognosis. Standard two-step immunohistochemistry and semi-quantitative evaluation of immunohistochemical staining were used to determine syndecan-1 and syndecan-3 expression. Statistical evaluation on the impact of various putative factors was performed.

**Results:** In JE/PE or OE, syndecan-1 immunohistochemical expression was weak to moderate in the suprabasal and basal epithelial cells and absent to weak in the internal basal lamina, external basal lamina and gingival connective tissue (GCT) matrix. In JE/PE or OE, syndecan-3 expression was moderate in the suprabasal and basal epithelial cells and moderate to weak (in group 1) or moderate (in group 2) in GCT inflammatory cells and matrix.

**Conclusion:** Syndecan-1 -but not syndecan-3- expression in JE/PE or OE might be significantly positively correlated with the severity/degree of histological gingival/periodontal inflammation. The expression of both syndecans in JE/PE or OE is not significantly correlated with age, smoking and local clinical (local clinical attachment level and probing pocket depth) and radiographical (local radiographical bone loss) periodontal parameters.

## Topic: Basic Research: Aetiology and Pathogenesis

**P0012****Histomorphometric analysis of the differences in bone morphology of the buccal crest of anterior teeth**

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**Aim:** The coronal position and dimensions of the alveolar bone around teeth has been only scantily described in the literature to date. However, these features might be important determining the position of the gingival, the propensity of developing gingival recessions and the ability to optimize prospective implant sites. The aim of this study was to determine the prevalence of a thickening of the buccal alveolar bone among randomly selected block sections.

**Material and Methods:** Histological sections of anterior teeth were randomly selected from a pool of human block sections (donation to the university of Bejing for educational purposes) (av. age±SD 37.02±17.89). Sections were prepared according to Donath (1988). Computer based histomorphometric analysis was performed on all section as described earlier (Fürst 2003).

**Results:** Among 44 sections, a thickening of the alveolar crest was noted in 59 percent. This structure had the following dimensions in mm with SD (width: 0.62±0.31; height: 2.73±1.41). Statistically significant difference in lingual bone area was found in mandibular sections with or without the thickening. Histomorphometric analysis did not reveal any significant differences between section with thickening and those without.

**Conclusion:** Within the limitations of this descriptive study, crestal thickenings around teeth are most often encountered in mandibular incisors. In the absence of the thickening, a greater area of lingual/palatinal bone was observed.

## Topic: Basic Research: Aetiology and Pathogenesis

**P0013****The Relationship Between Matrix Metalloproteinase-1 (MMP-1) -1607 Single-Nucleotide Polymorphism And Aggressive Periodontitis in Turkish Population**

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**Aim:** The gene coding for Matrix metallo proteinase 1 is a strong biological candidate gene for periodontal diseases. The aim of this study was to evaluate the relationship between MMP-1 -1607 1G/2G polymorphism and aggressive periodontitis (AgP), and to determine the genotype-phenotype relations and to indicate whether the polymorphism has a role in susceptibility to AgP.

**Material and Methods:** A total of 165 subjects, 65 patients suffering from AgP and 100 periodontally healthy individuals were included. None of the subjects were medically compromised. Genomic DNA was obtained from the peripheral blood of individuals. MMP-1 -1607 1G/2G polymorphism was determined by polymerase chain reaction and restriction fragment length polymorphism methods. Clinical parameters including plaque index, bleeding on probing, probing depth, clinical attachment levels, mobility and radiographs were evaluated.

**Results:** The distribution of MMP-1 genotypes did not significantly differ between AgP and healthy groups. The frequency of the 2G allele

was (%36.9) in AgP while it was (%37.0) in health. Also the localized aggressive periodontitis (LAP) and healthy group were reevaluated. The results were very similar. 2G allele frequency was (%36.7) at LAP group, and (%37.0) at healthy group. The analysis showed that carrying polymorphic allele genotypes were not risk factor for AgP

**Conclusion:** Our study showed that the distribution of MMP-1 gene -1607 1G/2G polymorphism among AgP patients and healthy subjects are similar. Also the genotype distribution among the LAP and the healthy group are similar, too. These data suggest that MMP-1 gene -1607 1G/2G polymorphism is not associated with the susceptibility to AgP in Turkish population

## Topic: Basic Research: Aetiology and Pathogenesis

**P0014****Effect of alendronate and atorvastatin combination on alveolar bone loss in rats**P. Goes<sup>1</sup>, A.P.S. Lima<sup>2</sup>, I.M. Melo<sup>2</sup>, C.S. Dutra<sup>2</sup>, L.K.B. Monteiro<sup>2</sup>, A.D.D. Saldanha<sup>2</sup>, V. Lima<sup>2</sup><sup>1</sup>Sobral/Brazil, <sup>2</sup>Fortaleza/Brazil

**Aim:** This work aimed to evaluate the effect of Alendronate (ALD) and Atorvastatin (ATV) combination on alveolar bone loss (ABL) in experimental periodontitis.

**Material and Methods:** Periodontitis was induced by ligature around the upper 2nd in Wistar rats. Groups of 6 animals received prophylactically (P), 30 min before ligature and daily, until sacrifice, 0.9% Saline (SAL) or ALD (0.01 or 0.25 mg/kg) s.c. or ATV (0.3 or 27 mg/kg) v.o. or the combination of ALD+ATV (0.25+27; 0.01+0.3; 0.25+0.3; 0.01+27 mg/kg). Another group received the lower doses combination of ALD+ATV (0.01+0.3 mg/kg), therapeutically (T), 5 days after ligature and daily until sacrifice. On the 11th day, animals were killed and maxillae were removed for macroscopic, histopathological, histometric and immunohistochemical analysis. Gingival samples were collected to evaluate myeloperoxidase (MPO) activity. Blood samples were collected for bone-specific alkaline phosphatase (BALP) dosage.

**Results:** Macroscopic results showed that all combined therapy prevented ABL when compared to SAL or low doses monotherapy with ALD (4.2±0.4 mm<sup>2</sup>) or ATV (4.2±0.3 mm<sup>2</sup>) (P<0.05). Lower doses combination (P=2.8±0.1 mm<sup>2</sup>; T=2.0±0.5 mm<sup>2</sup>) prevented ABL when compared to SAL (4.4±0.2 mm<sup>2</sup>). Histological and histometric analysis confirmed macroscopic data. Treatments caused mild tartrate resistant acid phosphatase immunostaining and inhibited MPO activity (P=14.2±4.4; T=10.9±3.2; SAL=53.2±12.7), and prevented BALP reduction when compared to SAL (P<0.05).

**Conclusion:** Thus, lower doses ALD+ATV combination showed a protective effect on experimental alveolar bone loss.

## Topic: Basic Research: Aetiology and Pathogenesis

**P0015****The interferon status in cases with severe forms of periodontitis**

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**Aim:** Periodontitis is an inflammatory disease resulting in the destruction of tissues of the periodontium due to increased production of lytic enzymes and stimulation of osteoclastogenesis involving innate and adaptive immune responses of the body. The interferon status is known to be indicative of responsiveness and functional activity of the IFN system in different forms of pathology. We have studied the interferon status by examining 147 patients, both male and female, at the age of 35-50, with severe form of periodontitis, for the purpose of detection and assessment of the potential effect of disorders at different levels of the IFN system in the pathogenesis of periodontitis.

**Material and Methods:** The parameters of the IFN status were assessed by using the micromethod in whole heparinized blood based on the techniques offered by Grigoryan S.S, et al (1988).

**Results:** The imbalanced  $\alpha$ - and  $\gamma$ -IFN production demonstrated by the patients with severe form of periodontitis was accompanied by a moderately increased IFN content in blood, its spontaneous production in vitro remaining within the physiological range.

**Conclusion:** Patients with severe form of periodontitis demonstrate disorders of different intensity in interferon production, which collectively are indicative of involvement of the basic, innate system of non-specific resistance of the body – the IFN system – in the disease process. Each pattern of dysfunction of IFN $\alpha$  and IFN $\gamma$ , serum and spontaneous IFN production is likely to be indicative of its involvement in the disease process and of a specific stage of the clinical progression

Topic: Basic Research: Aetiology and Pathogenesis

## P0016

### Gene and protein expression of TNF- $\alpha$ converting enzyme (TACE/ADAM17) and tissue inhibitor of metalloproteinases (TIMP)-3 in gingival tissues from periodontitis patients with drug-induced gingival overgrowth

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**Aim:** It is known that TACE has a critical role in fibrotic inflammatory diseases such as liver fibromatosis, and specifically inhibited by tissue inhibitor of metalloproteinases (TIMP)-3. Periodontitis is often combined with fibrotic drug-induced gingival overgrowth (GO), however neither TACE nor TIMP-3 have examined enough in periodontal tissues yet. The aim of the present study was to analyse mRNA expression levels and the protein localisation of TACE and TIMP-3 in gingival tissues from patients with drug (calcium-channel blocker) induced (GO) and periodontitis (P).

**Material and Methods:** The study was approved by the regional ethics committee of Faculty of Dentistry, Niigata University. A total of 30 gingival tissue samples were taken from 15 GO and 15 P patients. mRNA Expression levels were analysed by quantitative real-time Polymerase Chain Reaction, and the protein localisation was investigated with immunohistochemistry. Statistics were analysed by Mann-Whitney U-test.

**Results:** TACE and TIMP-3 mRNA levels were significantly higher in GO than those in P group ( $p < 0.05$ ). TIMP-3 immunoreactivity was observed on the endothelial cells, fibroblasts,

and some inflammatory cells, while TACE-producing cells were detected on mainly macrophage-like cells and plasma cells.

**Conclusion:** It was found that TACE and TIMP-3 expressing-cells were detected, and the mRNA levels were differentially expressed between GO and P gingival tissues, both of which are potentially involved in pathogenesis of the diseases.

Topic: Basic Research: Aetiology and Pathogenesis

## P0017

### Pharmacological evidences for involvement of calcium entry through TRPV1 channels in nifedipine-induced gingival overgrowth

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**Aim:** In gingival fibroblasts, nifedipine (an anti-hypertension drug) elevates the intracellular calcium concentration ( $[Ca^{2+}]_i$ ) by enhancing both  $Ca^{2+}$  influx through nonselective cation channels (NSCCs) and  $Ca^{2+}$  release from intracellular  $Ca^{2+}$  stores. As a result of these phenomena, nifedipine causes gingival overgrowth as a side effect. Incidentally, transient receptor potential (TRP) channels were found in numerous excitable and non-excitable tissues, for example, central and peripheral neurons, intestine, kidney, etc.. Furthermore, TRP channels have been practically thought to be NSCCs. From these facts, it is inferred that the NSCCs influenced by nifedipine are TRP channels. In the present study, in order to determine whether the TRPV1 channels, one of TRP channel subtypes, participate in the actions of nifedipine, we pharmacologically investigated effects of TRPV1 channel modulators on the  $[Ca^{2+}]_i$  and interactions between nifedipine and TRPV1 channel antagonists.

**Material and Methods:** Gin-1 cells, normal human gingival fibroblasts, were used as the material. The  $[Ca^{2+}]_i$  was measured by using a video-imaging analysis system with fura-2/AM, a  $Ca^{2+}$ -sensitive fluorescent dye.

**Results:** TRPV1 channel agonists (capsaicin, olvanil, and resiniferatoxin) and TRPV1 channel activators (anandamide and 2-APB) concentration-dependently elevated the  $[Ca^{2+}]_i$ . TRPV1 channel antagonists (capsazepine, AMG9810, ruthenium red, and iodoresiniferatoxin) inhibited the nifedipine-induced  $[Ca^{2+}]_i$  elevation.

**Conclusion:** The findings obtained suggest that  $Ca^{2+}$  entry through TRPV1 channels is involved in nifedipine-induced gingival overgrowth following  $[Ca^{2+}]_i$  elevation.

Topic: Basic Research: Aetiology and Pathogenesis

## P0018

### Amyloid beta (A $\beta$ ) precursor protein expression in periodontitis-affected gingival tissues

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**Aim:** The aims of the present study were to analyse 1)

transcriptomes, biological pathway frequency and 2) transcript levels of Alzheimer's disease (AD)-related proteins including amyloid beta (A $\beta$ ) precursor protein (APP), interleukin-1 beta (IL-1 $\beta$ ) and complement component 1 (q subcomponent, A chain) (C1QA), in periodontitis-affected gingival tissue compared to healthy tissues, and 3) the protein localisation of APP in gingival tissue by immunohistochemistry (IHC).

**Material and Methods:** Ethics of the study was approved by the Ethics Community of Niigata University, Faculty of Dentistry. Gingival tissues were harvested from 14 patients with chronic periodontitis during periodontal surgery or tooth extraction. Total RNA was isolated and subjected to both DNA microarray and quantitative reverse transcription real time polymerase chain reactions (qRT-rtPCR), and then the statistical analyses were performed. The immunolocalisation for APP was analysed by IHC.

**Results:** In periodontitis, 15 biological pathways such as leukocyte transendothelial migration, toll-like receptor signaling and AD pathways were increased, while 4 pathways including cell communication, arachidonic acid metabolism were decreased. APP, IL1 $\beta$  and C1QA belonging to AD pathway were statistically significantly upregulated in periodontitis-affected gingival tissues by qRT-rtPCR confirmation. The APP localisation was observed on the part of macrophage-like cells in gingival connective tissues underneath the epithelial layers.

**Conclusion:** Elevated APP, IL-1 $\beta$  and C1QA transcripts and APP-expressing macrophage-like cells in periodontitis-affected gingival tissues indicated a potential mechanism that APP contributes to clinical onset and progression of periodontitis and/or AD, which share common feature as age-related chronic inflammatory diseases with tissue destruction.

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P0019

### Effects of sword bean extract on the oral bacteria and progression of rat experimental periodontitis by *Porphyromonas gingivalis*

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**Aim:** Canavalia gladiata, usually called sword beans, is a domesticated plant species in the legume family and is known to contain canavanine. The fruit has long been used in Chinese herbal medicine for discharge of pus, but the functional mechanism of which is little understood. The purpose of the study was to examine the effect of sword beans on the oral bacteria and progression of rat experimental periodontitis induced by *Porphyromonas gingivalis* (*P. gingivalis*) infection.

**Material and Methods:** The sword bean extract were obtained with 50% ethanol and lyophilized. The lyophilized sword bean extract (SBE) were stored at -80°C until use. The HPLC/UV method was applied to the quantitative characterization of the canavanine in the SBE. The minimum inhibitory concentration and minimum bactericidal concentration of SBE and canavanine against oral bacteria were examined. To examine the effects of SBE on periodontal tissue breakdown, SBE was applied to the *P. gingivalis*-induced experimental periodontitis in rats. The effects of SBE and canavanine on Arg-gingipain (Rgp) and Lys-gingipain (Kgp) were evaluated with colorimetric assay using synthetic substrates.

**Results:** SBE contained 6.4% canavanine. SBE and canavanine inhibited the growth of *P. gingivalis* and *Fusobacterium nucleatum*. The *P. gingivalis*-induced alveolar bone resorption was significantly suppressed with the administration of SBE, and the bone level was comparable with the non-infected groups ( $p < 0.05$ ). The Rgp and Kgp activity was significantly inhibited with SBE and canavanine administration ( $p < 0.05$ ).

**Conclusion:** The present study suggests that SBE might be effective against *P. gingivalis*-associated periodontitis.

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P0020

### Periodontal health in dental students, influence of smoking and test anxiety

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**Aim:** Aim of this study was to investigate possible influence of cigarette smoking and test anxiety on periodontal health of dental students.

**Material and Methods:** Participants consisted of 228 dental medicine student. The population has been characterized by a high standard of dental awareness found by above average standards of dental attendance and oral hygiene. A structured questionnaire about self report smoking, test anxiety and oral hygiene habits were filled out. Clinical examination included the assessment of dental plaque (DP), presence of supragingival calculus (SC), bleeding on probing (BOP), probing depth and clinical attachment level (CAL).

**Results:** There were 53 smokers (23%) and 175 non smokers (76.8%), with no differences in DP prevalence and oral hygiene habits between the groups. Smokers had significantly more sites with SC ( $p < 0.005$ ). Prevalence of individuals with at least one site with PD  $> 3$  mm was greater among smokers than nonsmokers, 53.1% and 46.9% respectively. Multivariate analyses identified smoking (OR=2.0-2.6) as risk indicator for PD  $> 3$  mm. Level of anxiety had no significant correlations with oral health in each clinical parameter we measured. Students with high level of test anxiety had more sites with BOP and percentage of DP regardless of smoking status, but without statistical significance.

**Conclusion:** Level of test anxiety had no impact on periodontal health of smokers and non smokers. Good oral hygiene was a sufficient measure for preventing stress related changes in oral environment. Cigarette smoking was found to be a risk factor for periodontal disease in young, healthy and dentally aware subjects independently of high oral hygiene preventive measures.

Topic: Basic Research: Aetiology and Pathogenesis

P0021

### Effect of Piroxicam on bone cells proliferation.

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Granada/Spain

**Aim:** Nonsteroidal anti-inflammatory drugs (NSAIDs) are frequently administered in dentistry because of their anti-inflammatory, antipyretic,

and analgesic capabilities. Several studies have demonstrated that different NSAIDs, such indomethacin, diclofenac, or ketorolac have an adverse effect on bone tissue. This may therefore delay the regeneration of bone tissue by decrease of osteoblasts proliferative capacities. Piroxicam is a NSAID that can be used after surgery affecting bone tissue for its pharmacological properties. The aim of this study was to analyze the effect of different doses of Piroxicam on bone cells proliferation.

**Material and Methods:** The MG63 cellular line was cultured during 24 hours, at 37°C in an atmosphere of CO<sub>2</sub> in a 5% with different a dose of Piroxicam (0.1, 1, 5, 10, 100, 1000 µM). The effect of Piroxicam on growth was determined through a spectrophotometric technique (MTT)

**Results:** The outcomes show a significant increase in the MG63 cell line proliferation after 24 hours of culture with 1 µM, 5 µM, 100 µM of Piroxicam ( $P \leq 0.001$ ), and this increase was on a doses dependent manner. Doses of 0.1 and 10 µM showed an increase with respect of control but data were not statistically significant.

**Conclusion:** These results suggest that Piroxicam would be used after periodontal surgery instead of other antiinflammatories because we detected an increase on bone proliferation even in therapeutic doses (100, 1000 µM).

Topic: Basic Research: Aetiology and Pathogenesis

P0022

### The effect of *Porphyromonas gingivalis* on hepatic metabolism in relationship between periodontitis and diabetes mellitus

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Tokyo/Japan

**Aim:** Diabetes mellitus and periodontal disease are two common chronic diseases that have long been thought to be biologically linked. The liver is an insulin sensitive organ that plays a key role in the regulation of the whole body energy homeostasis. In this study, we focused on the liver to investigate the production of TNF- $\alpha$ , IL-6, IRS-2, SREBP-1c and Adipo-R2 in response to a periodontal pathogen using experimental periodontitis mouse model and in vitro liver model.

**Material and Methods:** C57BL/6 (normal) and KKAY (diabetic) mice were infected orally with *Porphyromonas gingivalis* FDI 381. In vitro liver model, mouse Hepa-1.6 cells and macrophage-like cells (RAW 264) were stimulated with bacterial extracts prepared from *P. gingivalis*. TNF- $\alpha$ , IL-6, IRS-2, SREBP-1c and Adipo-R2 were measured using real-time PCR, ELISA and Western blotting. Alveolar bone level was measured by morphometric analysis and micro CT.

**Results:** The KKAY mice had a significantly higher level of alveolar bone loss than the controls. After *P. gingivalis* infection, liver of the KKAY mice showed significant increases in the mRNA levels of TNF- $\alpha$ , Adipo-R2, SREBP-1c, and significant decrease in IRS-2. However, no significant change was observed in serum. Similar results were observed in liver model.

**Conclusion:** These findings indicate that periodontitis may induce inflammatory cytokines, Adipo-R2 and SREBP-1c in liver, which, in turn, to modulate liver metabolism and diabetes mellitus. These mechanism may play a part in relationship between periodontitis and diabetes mellitus.

Topic: Basic Research: Aetiology and Pathogenesis

P0023

### A preliminary study on the migration of metallic constituents originating from Ag-Pd-Cu-Au cast post: clinical study

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**Aim:** The necessity of removing allergen containing metal cast posts in metal allergic patients is still questionable. Therefore, the purpose of this study was to investigate the migrating distance of corroded metallic constituents in root dentin from metal cast posts.

**Material and Methods:** Three extracted teeth restored with Ag-Pd-Cu-Au cast post cores were obtained from patients. All specimens were encased in autopolymerizing resins and longitudinally sectioned by a low-speed diamond saw. After polishing and removal of smear layer, the surfaces to be analyzed were coated with carbon film and investigated for the corroded metallic constituents in the root dentin areas by an electron probe micro analyzer. The distances of invasion were assessed by curve fitting procedure and percentage change of the count level.

**Results:** Negligible amounts of copper could be found. The longest invading distance among the specimens was 240 µm, based on the curve fitting procedure

**Conclusion:** Within the limitations of this study, it is unlikely that corroded ions from metal cast post could migrate to the outer root surface.

Topic: Basic Research: Aetiology and Pathogenesis

P0024

### Microbiological Profile and Calprotectin Expression in Naturally-Occurring and Experimentally-Induced Gingivitis.

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**Aim:** The present study was performed to evaluate the microbiological profile and the calprotectin expression in gingival crevicular fluid (GCF) in spontaneous and experimentally-induced gingival inflammation.

**Material and Methods:** Thirty-seven periodontally healthy subjects were evaluated in real life conditions (N-O gingivitis) as well as after 21 days of experimental gingivitis trial (E-I gingivitis). During the experimental gingivitis trial, in one maxillary quadrant (test quadrant), gingival inflammation was induced by oral hygiene abstention, while in the contralateral (control) quadrant, oral hygiene was routinely continued.

**Results:** The results of the study showed that (i) the microbiological profile of quadrants where gingival inflammation was experimentally induced (i.e. E-I test quadrants) differed significantly from that of either quadrants where gingival inflammation was controlled by proper plaque control (i.e. E-I control quadrants) or quadrants with N-O gingivitis, and (ii)

GCF calprotectin was significantly higher at E-I test quadrants compared to either E-I control quadrants or quadrants with N-O gingivitis. A positive intra-subject correlation was found between GCF concentration of calprotectin at sites presenting N-O and E-I gingivitis.

**Conclusion:** N-O and E-I gingivitis showed a different microbiological profile of the subgingival environment. GCF calprotectin is a reliable marker of gingival inflammation and its concentration in N-O gingivitis is correlated with its expression in E-I gingivitis. Calprotectin levels in GCF may be regarded as a promising marker of the individual susceptibility to develop gingival inflammation in response to experimentally-induced plaque accumulation.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0025

#### Histology of periimplant diseases

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**Aim:** Two types of periimplantitis can be clinically differentiated with and without pus formation. The presence of pus influences treatment modalities and clinical outcome. We conducted this study in an attempt to distinguish between these two types of periimplantitis histologically and to obtain further insight into the pathogenesis of periimplant diseases.

**Material and Methods:** The study included 28 patients (50.6±9.41 years) with a total of 104 implants. 50 implants (6.39 years±3.79 years in place) showed two different types of periimplantitis: Periimplantitis with pus formation (17 implants) and periimplantitis without pus formation (33 implants). During the surgical therapy, periimplant tissue specimens were obtained from intrasulcular sites and examined histologically after haematoxylin-eosin (HE) and iron (Fe) staining. Polarised light microscopy was performed to detect foreign material.

**Results:** After staining, tissue specimens from both types of periimplantitis showed chronic inflammation and membrane-like connective tissue structures with a proliferation of fibroblasts and collagenous fibres as well as infiltrates of lymphocytes, monocytes and plasma cells. Periimplantitis with pus formation was also associated with florid changes demonstrated by scattered neutrophils as well as blackish foreign material and focal haemosiderin deposits.

**Conclusion:** Peri-implant diseases can be differentiated both clinically and histologically. Periimplantitis without pus formation showed chronic inflammation and no florid changes whereas periimplantitis with pus formation was associated with the presence of incorporated foreign material and neutrophils. The role of foreign material in the development of florid inflammation should be investigated in further immunohistochemical studies.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0026

#### L-ascorbic acid 2-phosphate magnesium salt promoted collagen synthesis and exerted both antioxidant and anti-inflammatory properties in human gingival fibroblasts

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**Aim:** L-ascorbic acid 2-phosphate magnesium salt (APM) is an L-ascorbic acid (AsA) derivative developed to improve AsA stability and display effective biochemical characteristics. This study aimed to investigate the effects of APM on intake, collagen synthesis, antioxidant, and anti-inflammatory properties of human gingival fibroblasts (HGFs) with respect to the prevention of periodontal disease in comparison with those of AsA.

**Material and Methods:** HGFs were incubated in the presence or absence of APM or L-ascorbic acid sodium salt (AsANa). Intake of APM or AsANa was analyzed by HPLC. Collagen synthesis was measured by ELISA and real-time RT-PCR. Intracellular reactive oxygen species (ROS), induced by hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) or TNF- $\alpha$ , were quantified using CM-H<sub>2</sub>DCFDA. Cell damage induced by H<sub>2</sub>O<sub>2</sub> was estimated with calcein acetoxymethyl ester. Expressions of TNF- $\alpha$ -induced inflammatory cytokines, IL-6 and IL-8, were measured by ELISA and real-time RT-PCR.

**Results:** APM remarkably and continuously enhanced intracellular AsA and promoted type I collagen synthesis and mRNA expression. Furthermore, APM decreased cell damage through the suppression of H<sub>2</sub>O<sub>2</sub>-induced excess ROS. Productions and mRNA expressions of both IL-6 and IL-8 were inhibited by APM through the suppression of TNF- $\alpha$ -induced intracellular ROS. These effects of APM were superior to those of AsANa.

**Conclusion:** These results suggest that APM is more effective than AsANa in terms of collagen synthesis, suppressing excess ROS generation by enhancing intracellular AsA, and regulating inflammatory response through ROS suppression in HGFs. This indicates that local application of APM can help to prevent periodontal disease.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0027

#### Hydrogen-rich water prevents initiation of atherosclerosis induced by periodontitis in the rat

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**Aim:** Periodontitis has been causally linked to atherosclerosis, which is mediated through the oxidative stress induced by periodontitis. Since hydrogen-rich water (HW) scavenges reactive oxygen species (ROS), we hypothesized that HW may prevent endothelial oxidative stress induced by periodontitis in the aorta. The aim of this study was to investigate the effects of



HW on the initiation of atherosclerosis in a ligature-induced rat periodontitis model.

**Material and Methods:** Eighteen 8-week old male Wistar rats were divided into three groups of six rats; the periodontitis (P group), periodontitis + HW (P+HW group) and control groups. In the P and P+HW groups, periodontitis was ligature-induced for 4 weeks. The P +HW group rats were further given water containing 800-1000 µg/L hydrogen for 4 weeks.

**Results:** In the P group, lipid deposition in the descending aorta was observed. There were significant increases of serum levels of ROS and hexanoyl-lysine (HEL) (1.4 and 1.7 times, respectively), and aortic levels of nitrotyrosine expression, HEL expression and 8-hydroxydeoxyguanosine (7.9, 16.0, and 2.5 times, respectively) compared to the control group ( $P < 0.05$ ). In the P+HW group, lipid deposition was decreased. The P+HW group significantly decreased serum levels of ROS and HEL (0.79 and 0.46 times, respectively) and aortic levels of nitrotyrosine and HEL (0.27 and 0.19 times, respectively) compared to the P group ( $P < 0.05$ ).

**Conclusion:** These results suggest that HW prevents the initiation of atherosclerosis induced by periodontitis in the rat by decreasing oxidative stress.

Topic: Basic Research: Aetiology and Pathogenesis

P0028

### T cells from mice immunized with peptidoglycan accelerates lipopolysaccharide-induced osteoclastogenesis

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**Aim:** We reported that membrane-bound CD40 Ligand (mCD40L) on T cells from mice immunized with *Escherichia coli* (E. coli) lipopolysaccharide (LPS) accelerates osteoclastogenesis (Yokoyama, J Periodontal Res, 2011). However, it has been still unclear whether this is the particular phenomenon under LPS immunization. Gram-positive bacteria are dominant in the early stage of periodontal inflammation. Peptidoglycan (PGN) is a component of cell wall of both Gram-positive and Gram-negative bacteria and has some biological activities. PGN induces Th1 cells (Baker, J Phaol, 2006) and Th1 cells express mCD40L (Coppernolles, J Immunol, 2009) So, it is likely that T cells immunized with PGN accelerate osteoclastogenesis, however, there is no report about that. In this study, we investigated whether T cells from mice immunized with *Staphylococcus Aureus* (S. a) PGN accelerate osteoclastogenesis.

**Material and Methods:** T cells from mice received 13 times injections with E. coli LPS or S. a PGN into left mandible every 48h (LPS-T cells or PGN-T cells) were co-cultured with R-BMMs. After 24h, osteoclastogenesis in vitro was evaluated. The left mandible were then removed, fixed, decalcified, embedded in paraffin, sliced into serial sections and bone resorption in vivo was evaluated.

**Results:** PGN-T cells significantly accelerated osteoclastogenesis. LPS-T cells also showed similar findings. Moreover, the injection of PGN into mandible induced bone resorption in vivo.

**Conclusion:** These results suggested that PGN from Gram-positive bacteria can accelerate osteoclastogenesis in the early stage of periodontal inflammation. We supposed that PGN-T cells accelerate osteoclastogenesis with mCD40L like as LPS-T cells.

Topic: Basic Research: Aetiology and Pathogenesis

P0029

### Periodontal Ligament Sensory Apparatus: Morphological and Functional Characteristics and Reaction to Restoration Procedures using Single and Block Prosthetic Appliances

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**Aim:** The periodontal ligament is a group of specific connective tissue fibers that essentially joins a tooth to the alveolar bone within which it located. It also serves as periosteum to the alveolar bone and furnishes a firm connection between the root of tooth and the bone through transitional fibrous networks. It consists, in part, of thick collagenous bundles that run from the alveolar wall to the cementum. The nerve supply of the periodontal ligament is derived from the fifth cranial nerve, the trigeminal nerve, which emerges from the ventral surface of the pons, close to its upper border, as a large sensory and smaller motor root. According to findings, the periodontal ligament contains several nerve endings, which transmit information to CNS about degree of masticator forces and distribution in different parts of periodontal ligament. In this connection, the periodontal sensory receptors can be considered a barrier, which prevents teeth and jaws overload and regulates masticator forces in combination with the temporo-mandibular articular receptors and proprioceptors of tendons and muscles. The aim of this study was to investigate peculiarities of nerve terminations and their distribution in the periodontal ligament of human teeth different groups, as well as the reaction of frontal teeth periodontal ligament sensory apparatus to restoration procedures using single and block prosthetic appliances. The study was done using the Periosensomer device.

**Material and Methods:** The mandible and maxillary fragments with teeth were material for morphological evaluation. These fragments were taken from people, who died accidentally after casual traumas. In total, we studied material from 27 persons. We investigated 32 blocks, including both incisors and canine, as well as 8 blocks, including premolars and molars of mandible and maxilla from right and left sides. In total 40 blocks were studied. The samples were taken during dissection in 6-12 hours after death, at various pathology departments of municipality hospitals of Moscow. The material was fixed in 15-20% formalin, decalcified in 25% Trilon B solution (pH 8.3-8.5), then frozen and sectioned in sagittal and frontal directions. For revealing the nerve fibers sections (30-70 mm in thickness) were treated with Ag salts with subsequent hematoxylin staining. The nerve fibers myelin sheaths were revealed by staining with sudan black. For periodontal ligament sensory function evaluation, we used the "Periosensomer" device that was elaborated by us (The Patent for the invention of the Russian Federation No.2190983, 20.11.2002). The investigation was done using elaborated methods, i.e. the food "holding" and "splitting" test (The Patent for the invention of the Russian Federation. No.2190983, 20.11.2002). The research method consisted in

estimation of masticatory pressure and dynamics of its change in the process of food holding and its splitting between antagonist frontal teeth at various stages of prosthetic treatment. In clinical conditions, 44 persons with orthognatic occlusion and a healthy periodont were investigated. These patients did not have any prosthetic or orthodontic appliances.

**Results:** The morphological research of the tooth periodontal ligament revealed that it has well developed, compound sensory apparatus. All receptors of human periodontal ligament belong to the group of free nerve endings, having coiled or tree-like shape. Numerous nerve fibers are found in apical part of periodontal ligament. They are less frequent at the upper 1/3 part of root periodontal ligament and almost absent in tooth circular ligament. The investigation on functional condition of periodontal ligament sensory apparatus revealed that during food holding phase the least forces are recorded, when the jaw finds optimal position. At food holding by antagonist teeth testing of food position and consistence takes place. The changes in jaw position are provided by sensitivity of frontal teeth periodontal ligament receptors. The patients with healthy periodontal ligament and single appliances have normal (up to 1 N) receptors sensitivity. In this case, the full value of food holding and splitting is recorded. The usage of block dentures leads to changes of sensitivity threshold. Patients with block dentures do not feel food and its position normally, because of changing periodontal ligament sensitivity. They apply high forces for food splitting. We established that during certain stages of prosthetic treatment, such as anesthesia and fixation of temporary bridges connected in one block, the sensory function of periodontal ligament decreased up to 3-4 times. It can be either restored after fixing permanent single prosthetic appliances (e.g. venires) or remain decreased after fixing permanent bridges.

**Conclusion:** Our study concluded: in case of block prosthetic appliances usage, the suppression of periodontal ligament sensory function leads to the incensement of masticatory forces, which results in the stress of teeth included in block, as well as antagonists. Data obtained from the patients with fixed prostheses are of no less interest. In particular, it is revealed that upon prosthetic rehabilitation of included defects using block prostheses with several units, there is a sharp decrease of threshold values of tactile sensitivity that is expressed on the device in the form of increase of digital indicators at "holding" phase by dozens units. In addition, it was revealed that changes of sensitivity threshold depend also on the number of teeth included in the block prosthetic construction. The more teeth in an orthopedic construction, the further their sensitivity is decreased, i.e. there is a higher initial threshold load. These indicators in a distant terms (from 12 months to 2 years) partially decrease, i.e. there is an adaptation to the prosthetic rehabilitation. It is necessary to take into consideration that nervous terminations are closely connected with bunches of collagen fibers of periodontal ligament forming an original sensory apparatus, which reacts to the changes of pressure in collagen fibers. It gives the ground to consider that this apparatus plays rather important role in the chewing act being connected right after touch of the food object to the teeth. Signals going from receptors allow to precisely dose out masticatory forces and force of muscular reductions. Simultaneously, alongside with it, the jaw finds optimal position necessary for optimum processing of food. Estimating periodontal ligament sensory function and sensory reaction dynamics during food holding and splitting phase can be introduced as a method for functional diagnosis in prosthetic dentistry.

Topic: Basic Research: Aetiology and Pathogenesis

## P0030

### Evaluation of the Root Surface Microtopography Following the Use of Two Polishing Systems by Confocal Microscopy (CFM) and Scanning Electron Microscope (SEM). An In Vitro Study.

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**Aim:** To compare the efficacy of two polishing instruments for root planing after scaling the root surface with conventional curettes.

**Material and Methods:** This comparative study was carried out on a sample of ten extracted human teeth with twenty interproximal root surfaces. The control group comprised twenty interproximal root surfaces that were randomly assigned and divided into two control groups of ten surfaces each. The two control groups also served as the two test groups. Control group 1 and 2: Gracey Curettes, 15 vertical strokes. Test group 1: control group 1 + Termination Diamond Curettes, 15 strokes. Test group 2: control group 2 + Termination Diamond Burs -15 Åµm with irrigation for 15 seconds at 3000 rpm. Control and test measurements were taken with confocal microscopy (CFM) in the same point. To evaluate the sample for the Scanning Electron Microscope (SEM), a horizontal mark was made on the middle of the root to delineate the inferior part corresponding to the control and the superior part corresponding to the test. The primary outcome variable was surface roughness (Ra).

**Results:** CFM showed that the two instruments evaluated - the Termination Diamond Curettes, mean changes in the value of surface roughness (Ra)  $-0.11 \pm 0.14$  being statistically significant ( $p$ -value = 0.000), and the Termination Diamond Burs -15 Åµm (Ra:  $-0.27 \pm 0.86$ ) being statistically significant ( $p$ -value = 0.037) - reduced roughness after scaling with Gracey Curettes (control group). Non-Statistically significant differences were observed in roughness ( $p$ -value = 0.581) between the two polishing instruments. Images from the SEM showed that the control group had parallel grooves and short extended filopodia, which were not observed in the test groups. Group 2 showed a generally rougher surface with more parallel grooves than Group 1.

**Conclusion:** : Termination Diamond Curettes and Termination Diamond Burs-15 Åµm leave a smoother root surface after root planing than with Gracey curettes alone. Termination Diamond Burs-15 Åµm reduce more the surface roughness than the Termination Diamond curettes after being scaled with Gracey Curettes.

Topic: Basic Research: Aetiology and Pathogenesis

## P0031

### Comparative analysis among *Porphyromonas gingivalis* and *Escherichia coli* LPS on the induced periodontitis. Pilot study.

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**Aim:** The aim of this study was to compare the induction of experimental periodontitis in rats by *Porphyromonas gingivalis* (*P. gingivalis*) and LPS from *Escherichia coli* (*E. coli*) in different concentrations (A-30ug/ul and B-60ug/ul).

**Material and Methods:** The sample consisted of 48 male Wistar rats (150g), randomly divided into three experimental groups with 16 animals each one: Group I -Control; Grupo II - Periodontal Disease-induced by LPS from *E. coli*; Group III - Periodontal Disease-induced by *P. gingivalis*. Each group with induced-periodontitis were subdivided into two subgroups according to the concentrations: A-30ug/ul and B-60ug/ul. The animals were sacrificed after 30 days of periodontitis induction. The jaw bone loss was analyzed histometrically and gum tissue expression of Interleukin 1b (IL-1B) and TNF-alpha was analyzed by real time PCR technique with Sybr Green Kit and specific primers.

**Results:** We observed higher bone loss in the groups of Periodontal-disease induced by *E. coli* LPS and *P. gingivalis* at a concentration of 60ug/ul. Tissue expression of IL-1b and TNF-a were statistically higher in the group II at a concentration of 60ug/ul.

**Conclusion:** Among the limitations of this study, it was concluded that *P. gingivalis* at a concentration of 60ug/ul was able to trigger a higher bone loss and expression of IL-1B and TNF-a in a periodontitis experimental in rats.

Topic: Basic Research: Aetiology and Pathogenesis

## P0032

### Sp1 and NFkB in periodontitis and gingivitis lesions

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**Aim:** The aim of this study was to investigate the expression of and correlation between Sp1 and NFkB in periodontitis and gingivitis lesions in subjects with different IL-10 genotypes.

**Material and Methods:** 30 subjects (age 52±10) with generalized, severe periodontitis and 17 subjects (age 59±9) with gingival inflammation and no attachment loss were recruited. Genotyping was performed to identify subjects with either GG, AG or AA genotypes for the -1087 IL-10 gene polymorphism (rs1800896). Gingival biopsies were collected from inflamed sites and prepared for immunohistochemical analysis.

**Results:** Although the size of the lesion in periodontitis sites was larger than that of the gingivitis sites there was no difference in the density of cells positive for Sp1 and NFkB between the two types of lesions or between IL-10 genotypes. A pair-wise correlation analysis revealed a significant correlation between the % of NFkB positive cells and cells positive for Sp1 in gingivitis samples ( $r=0.810$ ,  $p<0.01$ ) and in periodontitis specimens ( $r=0.581$ ,  $p<0.01$ ). A significant correlation between Sp1 and NFkB was found for the IL-10 genotypes GG ( $r=0.902$ ,  $p<0.01$ ) and AA ( $r=0.586$ ,  $p<0.05$ ), while no such correlation was found for the AG genotype ( $r=0.412$ , NS).

**Conclusion:** The expression of Sp1 and NFkB is correlated in periodontitis and gingivitis lesions. IL-10 genotypes influence this correlation.

Topic: Basic Research: Aetiology and Pathogenesis

## P0033

### The effectiveness of non-surgical treatment to reduce levels of IL-18 in GCF from inflamed periodontal sites

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**Aim:** Our aim was to evaluate the effectiveness of the non-surgical periodontal treatment in reducing the GCF levels of IL-18 from inflamed periodontal sites.

**Material and Methods:** After clinical examination, in which probing pocket depth (PPD), probing attachment level (AL), plaque index (PI) and gingival index (GI) were recorded, gingival fluid samples from 9 chronic periodontitis patients were collected from gingivitis (GP) and periodontitis (PP) sites with an intracrevicular washing method. Samples were also taken in the same way from a group of 5 patients with gingivitis alone (GG). The levels of IL-18 were measured by ELISA. The subjects received non-surgical periodontal treatment and were re-evaluated 30 days later (day 30 AT).

**Results:** There was a significant reduction in the PI day 30AT in all groups. PPD reduced significantly in GG and PP in day 30AT. GI reduced significantly only in the GG sites. It was observed a significant reduction in the GCF levels of IL-18 in day 30AT when all the samples (GG, GP and PP) were analyzed together.

**Conclusion:** This study shows that non-surgical treatment is effective in reducing GCF levels of IL-18 from inflamed periodontal sites.

Topic: Basic Research: Aetiology and Pathogenesis

## P0035

### Prevention of endodontic-periodontal lesions caused by lateral and furcal accessory canals: An in-vitro study

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**Aim:** Endodontic-periodontal lesions are clinical symptoms of the inflammatory communication between pulpal and periodontal tissues via open structures such as lateral, accessory, furcal canals, apical foramina, dentinal tubules. The aim of the study was to assess the prevention of these lesions coming from lateral and furcal accessory canals by eliminating the whole pulpal contents in these irregularities by means of ultrasonic irrigation and traditional syringe irrigation.

**Material and Methods:** Thirty-one recently extracted human single-rooted teeth were used for this study ( $n=31$ ). The teeth were instrumented at the working length to #35 file before creating three simulated lateral canals on the mesial, distal and furcal surfaces of the root, using #20 engine reamer. After enlarging root canals to a #45 file, all the canals were filled with dentin chips mixed with gliserol and pushed by #20 plugger into the canals, then confirmed radiographically. The teeth were randomly divided into two equal groups of 15 and one tooth was used as control tooth and irrigated according to the following techniques. Passive ultrasonic irrigation (PUI)



(group A), traditional syringe irrigation (group B), no irrigation was performed for control group (group C). After the irrigation procedures, the irregularities were controlled radiographically and scored according to the amount of the chips. The results were subjected to Mann-Whitney test.

**Results:** The lateral canals at coronal, middle, apical thirds and furcal accessory canals there were no chips in group A. This difference was statistically significant  $p < 0.05$ .

**Conclusion:** Ultrasonically activated solutions can reach the irregularities better than traditional syringe irrigation by acting microstreams and cavitations.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0036

#### Oral infection with *Porphyromonas gingivalis* and systemic cytokine profile in C57BL/6.KOR-ApoEshl mice

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**Aim:** Periodontal infection affects atherosclerotic diseases such as coronary heart diseases. Mouse models have revealed that *Porphyromonas gingivalis* oral infection induces changes in inflammatory- and lipid metabolism-related gene expression, regardless of the development of atherosclerotic lesions. However, the serum protein expression profile in the oral infection model has not been investigated. The present study aimed to analyze the effect of *P. gingivalis* oral infection on the expression levels of multiple cytokines in the serum in Apolipoprotein E-deficient mice by using a cytokine antibody array.

**Material and Methods:** C57BL/6.KOR-Apoeshl mice were orally infected with *P. gingivalis* 5 times at 3-day intervals and were then euthanized. Splenocytes were isolated and analyzed for proliferative activity and immunoglobulin (Ig) G production in response to *in vitro* restimulation with *P. gingivalis*. The expression level of various cytokines in the sera was analyzed using a mouse antibody array glass chip.

**Results:** Splenocytes from *P. gingivalis*-infected mice demonstrated significantly greater proliferation and IgG production in response to *P. gingivalis* compared with those from sham-infected mice. Antibody array analysis revealed the selective upregulation of matrix metalloproteinase 3 (MMP-3), intercellular adhesion molecule 1 (ICAM-1), insulin-like growth factor binding protein 2 (IGFBP-2) and chemokine (C-X-C motif) ligand 7 (CXCL7) and the downregulation of interleukin (IL) -17, tumor necrosis factor (TNF) - $\alpha$  and L-selectin.

**Conclusion:** These data demonstrate that oral infection with *P. gingivalis* induces alterations in systemic cytokine production. Those cytokines could play roles in the development of not only periodontitis but also atherosclerosis.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0037

#### A retrospective study on the root morphology of the maxillary first premolar in dependence of the location of the permanent canine.

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Vienna/Austria

**Aim:** Among the premolars the maxillary first has most often separated roots and in most cases a pronounced mesial concavity. This study aimed to determine the impact of the permanent canine on the root development of the premolars. Maxillary CT scans were assessed retrospectively on the incidence of different root morphologies of the premolars in dependence of the location of the permanent canine.

**Material and Methods:** Maxillary CT scans of 305 patients were included: 115 patients with regular erupted canines and 190 patients with at least 1 impacted canine. The location of the canine and the number of the roots of the premolars were assessed. The incidence of separated roots of the premolars in patients with impacted or regular erupted canines was opposed by the McNemar test.

**Results:** Patients with regular erupted canines presented a significantly higher incidence of premolars with separated roots (all  $p$ -values  $< 0.033$ ). In patients with a regular erupted right canine the first premolar presented separated roots in 73% and the second premolar in 20%, while in patients with an impacted canine the first premolar presented separated roots in 50% and the second premolar in 11% (similar results on the left side: erupted canine - first premolar in 70% separated roots and second premolar in 20%; impacted canine - first premolar in 39% and second premolar in 4%).

**Conclusion:** The location of the maxillary permanent canine seems to influence the root development of the premolars. A regular positioned canine might promote root separation of the premolars due to limited space.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0038

#### The Nature of the Mandibular Canal

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**Aim:** Injury of the inferior alveolar nerve during implant placement is one of the most feared complications. Therefore, knowledge about the location and configuration of the mandibular canal is required before implant placement in the mandibula. So far, radiological studies reported, that a decreased trabeculation pattern is correlating with an absence of mandibular canal corticalization. The aim of the present histological study was to compare the density of the trabecular bone of ground sections of the first molar region in the mandibula with the amount of mandibular canal depiction.

**Material and Methods:** The bone volume per tissue volume of the trabecular bone in 32 ground sections of the mandibular first molar region was determined. The presence of the canal



depiction was evaluated every two degrees. Spearman correlation was applied to assess a possible correlation between these two parameters.

**Results:** The bone volume per tissue volume of the trabecular bone correlated significantly positive with the amount of the canal depiction ( $p=0.001$ ,  $\rho=0.561$ ). That means, ground sections with low values of bone volume per tissue volume in the trabecular bone area presented only fragmentary canal depiction.

**Conclusion:** The results of this histological study confirmed previous radiological studies. We conclude, that the bone surrounding the alveolar nerve and vessels might be trabecular bone and no cortical bone and consequently no typical canal structure. Regarding implant placement, the surgeon has to keep even more care in patients with a low bone quality, because they seem to have less canal depiction, which could protect the alveolar nerve.

Topic: Basic Research: Aetiology and Pathogenesis

P0039

### Increased osteoclast formation and bone resorbing activity of IL-1Ra KO mice compared with WT mice.

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Nagoya/Japan

**Aim:** The IL-1 receptor antagonist (Ra) binds to IL-1 receptors and inhibits IL-1 activity. High levels of IL-1Ra may be present in the periodontal tissue of periodontitis. However, it is unclear whether IL-1Ra plays a protective role in periodontitis. The purpose of this study is to compare proinflammatory cytokine production, osteoclast formation, and bone resorbing activity between IL-1Ra knockout (KO) and wild type (WT) mice.

**Material and Methods:** Peritoneal macrophages (MØ) were obtained from mice and stimulated with *Aggregatibacter actinomycetemcomitans* (A.a.) lipopolysaccharide. Supernatant fluids were harvested and assayed for osteoclast formation and bone resorbing activity. Supernatant fluid cytokine levels were measured by ELISA, osteoclast formation by TRAP staining and the volume of bone resorption was analyzed by micro-CT.

**Results:** The levels of IL-1, TNF- $\alpha$ , and IL-6 in IL-1Ra KO mice were significantly higher than WT mice ( $P<0.001$  in each cytokine). Moreover, osteoclast formation and bone resorption were significantly increased in IL-1Ra KO compared with WT mice ( $P<0.01$ ). However, COX-2 levels were similar in both groups, and the expression of EP4 was higher in IL-1Ra KO mice than WT mice.

**Conclusion:** In brief, IL-1Ra not only regulates IL-1 activity, but also appeared to reduce other inflammatory cytokines including IL-6, and TNF- $\alpha$  as well as reduction of expression of EP4 receptors related to the COX-2 reaction. These results suggest that IL-1Ra may be a useful anti-inflammatory molecule that could minimize inflammatory periodontal destruction. We are planning to test this hypothesis in vivo by comparing experimental disease severity between IL-1Ra KO and WT mice.

Topic: Basic Research: Aetiology and Pathogenesis

P0040

### Specific interaction of oral microorganisms with human multipotent stromal cells

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**Aim:** Periodontitis is a polymicrobial infection and can result in the loss of periodontal tissues. Resident adult stem cells have the capacity for tissue renewal after trauma. However, to study their potential application in tissue engineering, the influence of physiological and pathogenic oral bacteria adult stem cell lines has to be elucidated.

**Material and Methods:** In this study we cocultured the oral pathogens *Porphyromonas gingivalis*, *Fusobacterium nucleatum* and *Aggregatibacter actinomycetemcomitans* on dental progenitor cells and mesenchymal stem cells under anaerobic conditions. Adherence, internalization and the effects on the production of pro-inflammatory cytokines were monitored.

**Results:** The adherence and internalization is decreased on the mesenchymal stem cells with 0.2 % and 0.001 % compared to the gingival epithelial cells with 3.6 % and 0.01 %. The production of proinflammatory chemokines increased over time.

**Conclusion:** Finally, our results reveal species specific bacterial interactions with these different cell lines. Our finding of the increased resistance of stem cells to these bacteria is important for the knowledge about the physiological repair processes and for regenerative procedures.

Topic: Basic Research: Aetiology and Pathogenesis

P0041

### Interleukin (IL)-6, IL-8 and CXCL12 mRNA expression in human gingival and periodontal ligament fibroblasts is regulated by both MyD88 and TRAM

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**Aim:** Fibroblasts are now seen as active components of the immune response because these cells express Toll-like receptors (TLRs), recognize periodontopathogens and mediate cytokines and chemokines production during inflammation. This study investigated whether knocking down two important TLRs adaptor molecules such as myeloid differentiation protein (MyD88) and TRIF-related adaptor molecule (TRAM) could affect mRNA expression of Interleukin (IL)-6, IL-8 and CXCL12 in human gingival fibroblasts (HGF) and human periodontal ligament fibroblasts (HPLF).

**Material and Methods:** After small interfering RNA-mediated silencing of MyD88 and TRAM, HGF and HPLF were stimulated with *Porphyromonas gingivalis* lipopolysaccharide (LPS), *Escherichia coli* LPS, and two synthetic ligands of TLR2 (Pam3CSK4 and Pam3CSK4) for 6 hours. IL-6, IL-8 and CXCL12 mRNA levels were evaluated by qRT-PCR.

**Results:** Knockdown of MyD88 and TRAM decreased IL-6 and IL-8 mRNA levels in response to all stimuli in both fibroblasts subpopulations, but mainly in HGF. On the other hand, CXCL12 mRNA levels were upregulated by MyD88 and TRAM knockdown in HGF, but for HPLF it remained unchanged by both TLRs adaptor molecules silencing.

**Conclusion:** These results suggest that knocking down TLRs adaptor molecules, such as MyD88 and TRAM can decrease IL-6 and IL-8 mRNA expression and increase CXCL12, in HGF and HPLF. This can be an important step for the better understanding of the mechanisms that control the inflammatory cytokines and chemokines release which in turn contribute to periodontal pathogenesis.

Topic: Basic Research: Aetiology and Pathogenesis

**P0042**

### Regulation of osteoblastic differentiation by proteasome inhibitor bortezomib

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**Aim:** In eukaryotic cells, degradation of most intracellular proteins is carried out by the ubiquitin-proteasome pathway. Recent observations suggest that bone metabolism is regulated by their pathway, and certain proteasome inhibitor has been reported to induce bone formation. The clinical efficacy of bortezomib, a 26S proteasome inhibitor used as an anticancer drug, has been linked to an increase in bone markers in patients. Our purpose was to elucidate the effects of proteasome inhibitors on the regulation of osteoblastic differentiation and their molecular basis.

**Material and Methods:** The expression of osteoblastic gene expression was measured by real-time PCR using multipotent mesenchymal C2C12 cells cultures with or without proteasome inhibitors. Assays for transcriptional activities of reporter genes and Runx2 binding activity were performed.

**Results:** Bortezomib induced osteocalcin and alkaline phosphatase gene expression in C2C12 cells. In contrast, myogenic gene expression such as myogenin was reduced by bortezomib. Although these effects were similar to BMP-2, bortezomib did not induce transcription activities using reporter construct that have BMP responsive elements and Id gene expression. Also, bortezomib did not alter transcriptional activities of  $\beta$ -catenin dependent Top-flash reporter and canonical Wnt signaling target gene expression. Using osteocalcin promoter-luciferase constructs, bortezomib significantly increased the promoter activity. Mutations of not ATF4 binding site but Runx2 binding site in the promoter diminished bortezomib-induced this activity. Moreover, Runx2 binding activity was induced by bortezomib treatment in C2C12 cells.

**Conclusion:** These results indicate that bortezomib induces osteoblastic differentiation. Also, suggesting that the function of proteasome in controlling degradation of Runx2 plays an important role on bone formation.

Topic: Basic Research: Aetiology and Pathogenesis

**P0043**

### Relationship between total oxidant status and bone resorption markers in serum and gingival crevicular fluid in patients with periodontitis

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**Aim:** Increased levels of reactive oxygen species (ROS) leading to oxidative stress are involved in the pathogenesis of periodontitis. Receptor activator of NF- $\kappa$ B ligand (RANKL) and osteoprotegerin (OPG) are key molecules that regulate bone resorption, and an increased RANKL/OPG ratio is considered to be associated with bone loss. In this study, the relationship between total oxidant status (TOS), RANKL and OPG levels and RANKL/OPG ratios in serum and gingival crevicular fluid (GCF) were investigated in patients with periodontitis.

**Material and Methods:** Thirty chronic periodontitis (CP), 30 aggressive periodontitis (AP) and 28 periodontally healthy controls were included in the study. After clinical measurements and samplings, serum and GCF TOS, RANKL and OPG levels were determined by a novel automatic colorimetric method and enzyme-linked immunosorbent assays.

**Results:** Serum and GCF TOS, RANKL and RANKL/OPG values were higher in groups with periodontitis, as compared to controls ( $p < 0.05$ ). However, serum OPG levels were lower in the AP group, as compared to the CP and control group, while GCF OPG levels were lower in periodontitis groups, as compared to controls ( $p < 0.05$ ). Strong positive and negative correlations were observed between periodontal parameters, TOS and bone resorption markers ( $p < 0.05$ ).

**Conclusion:** Our results revealed that TOS and RANKL/OPG values were systematically and locally increased in periodontitis, and that this increase was more evident in aggressive than chronic forms. Our findings further suggested that increased TOS was closely related to the severity of periodontitis and bone resorption markers and, therefore, ROS could result in bone loss.

Topic: Basic Research: Aetiology and Pathogenesis

**P0044**

### Microbial profile of patients with aggressive and chronic periodontitis as compared to healthy subjects

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*Leipzig/Germany*

**Aim:** The aim of our study was to define and compare the microbiological profile of subgingival plaque in patients with aggressive and chronic periodontitis as well as in healthy subjects.

**Material and Methods:** Twelve patients with generalized aggressive periodontitis (AP), 12 patients with chronic periodontitis (CP) and 13 healthy subjects (HS) were enrolled in this study. Probing depth (PD), clinical attachment level (CAL), and bleeding on probing were recorded. Subgingival plaque samples were taken from the 4 sites with the highest value of PD per subject and then immediately cultivated. All anaerobic

strains were biochemically identified and where needed sequence analysis of the ribosomal RNA gene was performed. Statistical analysis was performed using Chi-Square and Mann-Whitney-U Test. After the Bonferroni correction,  $p < 0.001$  was considered to be significant.

**Results:** A total of 241 anaerobic isolates (51 species) were identified with a mean of 7.9 species per patient and 3.8 per healthy control subject. Significant differences were found for *Prevotella denticola* associated with AP and with high values of CAL within this group. The comparison between CP with HS showed a strong association with CP for: *Parvimonas micra*, *Prevotella disiensis*, *Porphyromonas gingivalis*, *Prevotella intermedia* and *Prevotella oralis* and with AP for: *Prevotella oralis*, *Parvimonas micra*, *Anaerococcus prevotii*, respectively. The comparison between the AP and CP revealed only the predominance of *Porphyromonas gingivalis* in CP and of *Anaerococcus prevotii* in AP.

**Conclusion:** Our study showed the predominance of known pathogens in both periodontitis groups and the possible emergence of a new one, *P. denticola*.

Topic: Basic Research: Aetiology and Pathogenesis

P0045

### Calcium Homeostasis & Vitamin D Metabolism in Patients with Aggressive Periodontitis.

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**Aim:** Connection between pathogenesis of Aggressive Periodontitis (AP) and Calcium and Vitamin D metabolic disturbances attracts more and more attention of periodontologists. Besides its direct effect on calcium homeostasis, vitamin D has immunomodulatory action, that makes promising the study of vitamin D effect on AP pathogenesis.

**Material and Methods:** We studied 29 (17 male; 12 female) patients with AP ( $37.86 \pm 1.59$  y.o.), 30 patients without AP in control group ( $34.7 \pm 21.28$  y.o.). The main criteria of patient selection was an early onset of the disease (18-20 y.o.). Dental status was defined by clinical indexes. Laboratory assessment of mineral metabolism included: Calcium Total, Calcium Ionized, Parathormone, Calcitonin, Vitamin D (25-OH-D), Osteocalcin, resorption marker  $\beta$ -CrossLaps. StatPlus software, descriptive statistics methods (Student criterion) were used for statistical assessment of the results.

**Results:** In comparison with Control, AP patients had statistically significant increase of Calcium Ionized ( $1.16 \pm 0.02$  mmol/L,  $p < 0.05$ ), Calcium Total ( $2.49 \pm 0.03$  mmol/L,  $p < 0.05$ ). Statistically significant differences in bone metabolism score were found between AP patients and Control: decrease of calcitonin ( $3.82 \pm 0.9$  pg/ml,  $p < 0.05$ ) osteocalcin ( $3.93 \pm 0.87$  pg/ml,  $p < 0.05$ ) levels, increase of  $\beta$ -CrossLaps level ( $0.378 \pm 0.037$  ng/ml,  $p < 0.05$ ). 25-OH-D level was significantly lower in AP patients than in Control ( $15.64 \pm 1.93$  ng/ml,  $p < 0.05$ ).

**Conclusion:** Disturbances of calcium homeostasis and bone remodelling were found in AP patients. They manifest elevated Calcium total and ionized, decreased calcitonin and osteocalcin levels and an increased level of bone resorption marker  $\beta$ -CrossLaps. These findings indicate suppression of bone formation and increase of bone resorption. That can be connected with the revealed lack of vitamin D in AP patients.

Topic: Basic Research: Aetiology and Pathogenesis

P0046

### The presence of MAIT cells in human periodontal tissues

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**Aim:** One of the major challenges in periodontology is the profound understanding of host immune responses to bacterial infection. Mucosal associated invariant T (MAIT) cells are a distinct subgroup of  $\alpha\beta$ T cells expressing the invariant T-cell receptor Va7.2-J $\alpha$ 33 in human. They were described as IL-17 secreting cells which interact with bacterially infected cells, and they are involved in various inflammatory and autoimmune diseases. However their presence has never been previously reported in periodontitis lesions. The aim of this study was to evaluate their presence in human gingival samples.

**Material and Methods:** Gingival tissue samples were obtained from patients with chronic periodontitis (test group) and from patients with clinically healthy periodontium (control group). The samples were analysed by flow cytometry using anti-TCR Va7.2 and anti-CD161 antibodies to identify MAIT cells. The chemokine receptor 6 (CCR6) expression of these cells was also measured using anti-CD196 antibody.

**Results:** In our preliminary study MAIT cells were present in both healthy and periodontitis lesions. However their relative percentage to other lymphocytes was slightly decreased in periodontitis samples. The CCR6 expression of MAIT cells showed a significant decrease in periodontitis lesions.

**Conclusion:** The results showed that MAIT cells are present in human periodontal tissues. Change in their receptor expression profile was also observed in diseased sites. These results suggest that they may play a role in altered immune functions leading to the development of periodontal disease.

Topic: Basic Research: Aetiology and Pathogenesis

P0047

### Effects of Smoking on Salivary C-telopeptide Pyridinoline Cross-links of Type I Collagen and Osteocalcin Levels

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**Aim:** This study was planned to investigate whether smoker patients with inflammatory periodontal disease exhibit different salivary concentrations of C-telopeptide pyridinoline cross-links of type I collagen (ICTP) and osteocalcin (OC) compared to the non-smoker and/or ex-smoker counterparts.

**Material and Methods:** Whole saliva samples, full-mouth clinical periodontal recordings were obtained from 67 otherwise healthy patients with inflammatory periodontal disease. According to self-reports there were 34 smokers, 22 non-smokers and 11 ex-smokers. Salivary cotinine, ICTP and OC levels were determined by Enzyme-linked Immunoassays.

**Results:** Salivary cotinine measurements confirmed self-reports about smoking. Smoker patients revealed significantly higher

plaque index values than non-smokers ( $p < 0.05$ ). Bleeding on probing values were significantly lower in smoker group than ex-smoker group ( $p < 0.05$ ). There was no significant difference between the study groups in salivary ICTP levels ( $p > 0.05$ ). OC levels in smoker group was significantly lower than the other groups ( $p < 0.001$ ). Salivary ICTP levels correlated negatively with number of teeth present ( $p < 0.05$ ), positively with bleeding on probing ( $p < 0.01$ ). Salivary OC levels correlated negatively with years smoked ( $p < 0.01$ ).

**Conclusion:** Within the limits of this study, smoking seems to suppress salivary osteocalcin level but ICTP levels seem not to be affected by smoking status. This suppression in OC levels may be one mechanism of deteriorating effects of smoking on periodontal health.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0048

#### Insulin sensitivity and $\beta$ -cell function predict the development of periodontal infection

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**Aim:** To examine the association of insulin resistance and  $\beta$ -cell function with periodontal infection among a non-diabetic, non-smoking adult population in a longitudinal setting.

**Material and Methods:** A subpopulation of the Health 2000 Survey consisted of dentate subjects who were periodontally healthy in the baseline and without any indication of diabetes, aged between 30 and 64, who had never smoked and who had participated in the Follow-Up Study on Finnish Adults Oral Health four years later ( $n = 163$ ). The outcome variable was the incidence of periodontal pockets of 4 mm or deeper. Insulin sensitivity was measured using the Homeostasis Model Assessment Index for insulin resistance (HOMA-IR) and  $\beta$ -cell function using the Homeostasis Model Assessment Index for  $\beta$ -cell function (HOMA-B).

**Results:** Both HOMA-IR and HOMA-B indices associated with the incidence of deepened periodontal pockets of 4 mm or more. The IRR for the intermediate HOMA-IR index tertile was 1.2 (95% CI 0.7 – 1.9), and 1.5 (95% CI 1.0 – 2.3) for the highest HOMA-IR index tertile compared to the lowest HOMA-IR tertile after adjustment for confounding factors. The corresponding IRR for the intermediate HOMA-B index tertile was 1.2 (95% CI 0.8 – 2.0) and 1.6 (95% CI 1.0 – 2.6) for the highest HOMA-B index tertile compared to the lowest HOMA-IR tertile, respectively.

**Conclusion:** The results of this four year follow-up study showed that impaired glucose metabolism in the form of insulin resistance and beta cell function predicts the development of periodontal infection.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0049

#### Periodontitis aethiogenic agent, Porphyromonas gingivalis lipopolysaccharide, induces ROS-dependent autophagy

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**Aim:** Autophagy is a process characterized by the recycling of cellular organelles and can be induced by oxidative stress. Mitochondria is the major source of ROS, so all conditions able to alter mitochondria efficiency can enhance ROS production, having a direct and critical effect on oxidative stress. The aim of this research was to study the role of ROS-dependent autophagy in *P. gingivalis* lipopolysaccharide (LPS)-treated fibroblasts and elucidate if autophagy should be considered a protective rather than a pathological mechanism in LPS-induced mitochondrial dysfunction.

**Material and Methods:** Fibroblasts from gingival biopsies of healthy volunteers were cultured with 10 mg/ml LPS. Mitochondrial ROS generation was assessed by MitoSOX<sup>TM</sup>. Complex I and III from mitochondrial respiratory chain and autophagic protein was determined using Western blot. Acidic lysosomes was assessed by LysoTracker, and autophagic gene expression was determined by Real time Quantitative PCR.

**Results:** We observed an important increment of autophagy induced by mitochondrial ROS after LPS treatment, and antioxidant treatment significantly reduced autophagy levels. Moreover the inhibition of autophagy in LPS treatment promoted cell death, suggesting the protective role of autophagy in *P. gingivalis* LPS treatment.

**Conclusion:** These findings support the hypothesis that autophagy is a cytoprotective response to mitochondrial dysfunction induced by *P. gingivalis* LPS treatment

## Topic: Basic Research: Aetiology and Pathogenesis

### P0050

#### Lipophilic antioxidants protect of mitochondrial dysfunction in gingival fibroblasts promoted by Porphyromonas gingivalis lipopolysaccharide

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**Aim:** Mitochondrial dysfunction and oxidative stress have been proposed to have a role in pathophysiology of Periodontitis and inflammatory conditions. Such inflammatory response is evoked often by specific bacteria being the lipopolysaccharide (LPS) of *P. gingivalis* a key factor in this process. The aim of this study was to determine the effect of several antioxidants in mitochondrial dysfunction induced by *P. gingivalis* LPS.

**Material and Methods:** Fibroblasts from gingival biopsies of healthy volunteers were cultured with 10 mg/ml LPS, and 30uM CoQ10, 3uM alfa-tocopherol, 40uM BHA and 10mM



N-acetylcysteine. Mitochondrial ROS generation was assessed by MitoSOXTM; Complex I, II, III and IV from mitochondrial respiratory chain was determined by western blott. Citrate synthase (mitochondrial mass) from spectrophotometric assay. ATP levels were determined by a bioluminescence assay.

**Results:** We found that LPS treatment induced oxidative stress and mitochondrial dysfunction in fibroblasts. We found high level of mitochondrial ROS production in cells treated with LPS respect to control. Mitochondrial dysfunction was characterized by reduced expression levels of mitochondrial proteins complex I, II, III, and complex IV, and decreased Citrate synthase activity. ATP level was decreased also by LPS treatment. Antioxidants treatment induced an important protector effect, being more significant in CoQ10, and alpha-tocopherol, two lipophilic antioxidants.

**Conclusion:** Our findings support the possible protector role of antioxidants in mitochondrial dysfunction induced by P. Gingivalis.

Topic: Basic Research: Aetiology and Pathogenesis

P0051

### Mitochondrial dysfunction in gingival fibroblasts promoted by Porphyromonas gingivalis lipopolysaccharide

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**Aim:** Porphyromonas gingivalis is the primary etiologic agent of adult periodontitis. P. gingivalis cells surface component as Lipopolysaccharide (LPS) is an important pathogenic component involved in the initiation and development of periodontal diseases. Oxidative stress has been proposed as a relevant event in the most advance states of periodontal disease. The aim of this study was to determine mitochondrial dysfunction induced by P. gingivalis LPS and mitochondrial origin of ROS.

**Material and Methods:** Fibroblasts from gingival biopsies of healthy volunteers were cultured with 10 mg/ml LPS. Mitochondrial ROS generation was assessed by MitoSOXTM. Mitochondrial membrane potential was determinate by Mitotracker. Activity of Complex I and III from mitochondrial respiratory chain was determined using previously described spectrophotometric methods. Citrate synthase (mitochondrial mass) from spectrophotometric assay. Apoptosis was assessed by observing cytochrome c release, and caspase 3 activation by immunofluorescence.

**Results:** We found that LPS treatment induced oxidative stress and mitochondrial dysfunction in fibroblasts. We found high level of mitochondrial ROS production in cells treated with LPS respect to control. Mitochondrial dysfunction was characterized by reduced expression levels of mitochondrial proteins complex I and complex III, decreased Citrate synthase activity, and a drop in mitochondrial membrane potential. Moreover, LPS treatment initiate the intrinsic pathway of caspase-3-dependent apoptosis. CoQ10 supplementation attenuated ROS production, mitochondrial dysfunction, and cell death, suggesting that oxidative stress is involved in damage induced by P. Gingivalis LPS.

**Conclusion:** Our findings support the possible role of mitochondrial dysfunction and mitochondrial origin of oxidative stress in the pathological mechanism of P. Gingivalis.

Topic: Basic Research: Aetiology and Pathogenesis

P0052

### The role of Porphyromonas gingivalis SerB in periodontal bone loss in the mouse model

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London/United Kingdom

**Aim:** The aim of this study is to directly determine the role of SerB in murine periodontal bone loss.

**Material and Methods:** C3H mice were inoculated by oral gavage on days 1, 3 and 5 with Porphyromonas gingivalis W50(n=5) or a SerB deficient( $\Delta$ SerB) strain(n=5). Controls(n=6) were sham inoculated.

Alveolar bone levels were assessed morphometrically to determine the difference in bone loss between the different groups.

**Results:** Animals inoculated with W50 or  $\Delta$ SerB showed an increase in the total anaerobic colony counts in oral swabs when compared with sham infected controls. W50 and  $\Delta$ SerB infected mice showed  $17\% \pm 3\%$  and  $30\% \pm 3\%$  greater alveolar bone loss when compared with sham infected animals( $p < 0.05$ ) respectively.  $\Delta$ SerB infected mice showed  $11\% \pm 3\%$  greater bone loss compared with those infected with parent strain( $p < 0.05$ ).

**Conclusion:** The lack of serine phosphatase enzyme (SerB) of Porphyromonas gingivalis leads to increased colonization and increased bone loss in the mouse model.

Topic: Basic Research: Aetiology and Pathogenesis

P0053

### Antibacterial and Cytotoxicity Effects of Edible Herbs against Periodontopathic Bacteria and Fibroblast

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**Aim:** The aims of the study were to determine the in-vitro antibacterial and cytotoxicity activities of common edible herbs against periodontal pathogens and human periodontal ligament fibroblasts.

**Material and Methods:** Essential oils, methanol and aqueous extracts from plant components of Piper betle L. (betel leaf), P.sarmentosum Roxb. (wild betel/kadok leaf), P.nigrum L. (black pepper seed), Eugenia caryophyllata L. (clove bud) and Cinnamomum zeylanicum Blume (cinnamon bark) were used in this study. Broth microdilution tests were employed to determine the antibacterial activity of samples against Porphyromonas gingivalis ATCC 33277, Fusobacterium nucleatum ATCC 25586, Aggregatibacter actinomycetemcomitans ATCC 29522 and Enterococcus faecalis ATCC 29212. The Minimal Inhibitory Concentration (MIC) was measured using serial

dilution of samples at final concentration of 5.0 - 0.08 mg/mL. Subsequently, primary human periodontal ligament fibroblasts were exposed to the samples and the number of viable cells was counted to assess cytotoxicity effect.

**Results:** Essential oils and methanol extracts showed non-selective antibacterial activity, while aqueous extracts showed no antibacterial effects. Cinnamon bark oil showed the most active bacterial growth inhibition (MIC 0.21 - 0.63 mg/mL). Treatment of fibroblasts with samples resulted in > 70% cell viability.

**Conclusion:** Essential oils and methanol extracts of studied herbs showed potential inhibitory action against periodontal pathogens and retained compatibility with fibroblasts in culture. These findings suggest prospective therapeutic benefit for application of assay in the management of periodontal disease.

Topic: Basic Research: Aetiology and Pathogenesis

## P0054

### Periodontal Health of Smokers versus Never-Smokers

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**Aim:** This study was conducted to investigate clinical periodontal health in smoker versus never-smoker patient groups with similar and low plaque index scores in an attempt to evaluate the sole effect of smoking on gingival inflammation.

**Material and Methods:** Twenty people (10 smoker and 10 never-smoker) were included in the study, including seven men and 13 women. Inclusion criteria were; having no diagnosed systemic disease, presenting a score of 1 or 1.5 according to Quigley-Hein Plaque Index (PI). Clinical periodontal status was evaluated by recording Community Periodontal Index (CPI) and Gingival Index (GI). The Plaque Index and Gingival Index were recorded in the Ramfjord teeth, whereas the CPI index comprised all teeth present in the mouth. The data were compared statistically between the study groups using Mann-Whitney U test.

**Results:** The mean values of the PI were 1.06 and 1.23, respectively in the smoker and never-smoker group ( $p > 0.05$ ). Mean GI scores were 0.93 in both groups. Mean CPI scores were 0.88 and 0.85, respectively in the smoker and never-smoker group ( $p > 0.05$ ).

**Conclusion:** The findings of this preliminary study suggest that as long as the PI scores are low and similar, smokers do not exhibit an increased tendency for gingival bleeding than never-smokers.

Topic: Basic Research: Aetiology and Pathogenesis

## P0055

### The Serum Levels of Cytokines and Adipokines in Obese Rats With Periodontitis

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**Aim:** In the periodontal pathogenesis, interleukin (IL)-1 $\beta$ , IL-4,

IL-6 and tumor necrosis factor (TNF)- $\alpha$  are considered to be key cytokines. The adipocytes produce and increase the levels of some circulating cytokines in addition to the adipokines. The aim of this study is to investigate the role of cytokines (IL-1  $\beta$ , IL-4, IL-6 and TNF- $\alpha$ ) and adipokines (leptin, adiponectin, resistin) in the possible relationship between periodontitis and obesity.

**Material and Methods:** Study groups were constituted as normal-weight periodontally healthy (NH), normal weight periodontitis (NP), obese periodontally healthy (OH), and obese periodontitis (OP). Periodontitis was induced by ligature in 14 days. After sacrifice, cytokine and adipokine levels in serum samples were determined by ELISA.

**Results:** NH and NP groups have higher IL-4 levels than the obese rats ( $P < 0.0125$ ). The IL-6 levels were significantly higher in the NP, OH and OP groups than NH group ( $P < 0.0125$ ). Additionally, the IL-6 level was significantly higher in the OP group than the NP group ( $P < 0.0125$ ). Adiponectin was found significantly higher in the NH group than the OH and OP groups, while leptin and resistin levels have not presented any significant differences between the groups ( $P > 0.0125$ ).

**Conclusion:** Within the limitations of the study and the experimental obesity and periodontitis models used, it might be concluded that the key cytokines were affected by obesity rather than periodontitis, and obesity has resulted in increased proinflammatory (IL-6) and decreased antiinflammatory (adiponectin) adipokine levels. Further studies are needed to investigate the risk to develop atherosclerosis in obesity with the presence of periodontitis.

Topic: Basic Research: Aetiology and Pathogenesis

## P0056

### Interleukin-33 levels in gingival crevicular fluid, saliva or plasma do not differentiate chronic periodontitis.

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**Aim:** This study was planned to investigate whether gingival crevicular fluid (GCF), saliva, or plasma levels of interleukin-33 (IL-33) can differentiate patients with chronic periodontitis from subjects with healthy periodontium.

**Material and Methods:** GCF, whole saliva, and plasma samples together with full-mouth clinical periodontal recordings were obtained from 32 otherwise healthy non-smoker chronic periodontitis patients and 25 systemically and periodontally healthy non-smoker subjects. IL-33 levels in the biofluid samples were determined by Enzyme-Linked Immunoassays. Data were tested statistically by Mann Whitney U test.

**Results:** The GCF concentrations of IL-33 was significantly lower in the chronic periodontitis patients than the healthy subjects ( $P < 0.0001$ ), whereas the total amounts in GCF samples were similar ( $P > 0.05$ ). The salivary and plasma concentrations of IL-33 were indifferent in the two study groups ( $P > 0.05$ ).

**Conclusion:** According to the present findings the GCF, saliva or plasma levels of IL-33 could not differentiate chronic periodontitis patients and periodontally healthy subjects. Larger scale intervention studies may better clarify this issue.

Topic: Basic Research: Aetiology and Pathogenesis

## P0057

### Antibacterial Activity of Propolis and Gelam Honey (Melaleuca Cajaputi) against Periodontopathogens

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**Aim:** To determine the antibacterial activity of propolis and Gelam honey against periodontopathogens

**Material and Methods:** Different concentrations of propolis and Gelam honey (20%, 40% and 60% w/v) were screened against *Porphyromonas gingivalis* ATCC 33277, *Aggregatibacter actinomycetemcomitans* ATCC 29522 and *Fusobacterium nucleatum* ATCC 25586 by using agar well diffusion method. The minimum inhibitory concentration (MIC) of propolis and Gelam honey were determined by using two-fold serial broth microdilution technique at concentration ranging from 4 mg/mL to 0.0078 mg/mL. The minimum bactericidal concentration (MBC) values were then determined by subculturing method.

**Results:** Propolis showed larger zone of inhibition against all periodontopathogens tested compared to Gelam honey at different concentration. Gelam honey had capability to inhibit the growth of *Aggregatibacter actinomycetemcomitans* at concentration of 20% w/v, but did not inhibit the growth of *Porphyromonas gingivalis* and *Fusobacterium nucleatum*. Propolis showed MIC value of 1 mg/mL for all tested organisms and MBC only occurred against *Aggregatibacter actinomycetemcomitans* and *Porphyromonas gingivalis* at 1mg/mL and 2mg/mL respectively. However Gelam honey did not show any inhibitory effects with the tested concentration.

**Conclusion:** Propolis showed higher capability as antibacterial agents compared to Gelam honey against periodontopathogens tested, suggesting higher concentration of Gelam Honey may be needed to exhibit better antibacterial activity.

Topic: Basic Research: Aetiology and Pathogenesis

## P0058

### The Regulatory Effects of Diverse Mediators Against Osteoclastogenesis on Human Gingival Fibroblasts

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**Aim:** It has been reported that gingival fibroblasts might function to modulate osteoclastogenesis, however, these mechanisms' processes still remain unclear. The purpose of this study is to assess the effects of suppressive and enhanced osteoclastic mediators for osteoclastogenesis on human gingival fibroblasts with several LPS stimulations.

**Material and Methods:** Human gingival fibroblasts (HGF) obtained from four individuals were cultured with three different LPS types: *Porphyromonas gingivalis* (Pg), *Prevotella intermedia* (Pi), *E. coli* (E). mRNA was isolated from the HGF cultures and was examined for expressions of osteoclastogenetic mediators by RT-PCR. Gingival fibroblast-conditioned media

(HGF-CM) from the HGF cultures were used to investigate the osteoclastogenesis of osteoclast precursor cells, RAW264 (mouse macrophage), supplemented with RANKL, OPG, and IL-4. Differentiation of osteoclasts were analyzed by TRAP staining and TRAP phosphatase assay.

**Results:** All HGF cultures with different LPS types expressed suppressive mediators: OPG and IL-4 and enhanced mediators: IL-1 $\beta$ , IL-6, MCP-1, for osteoclastogenesis. With in RAW264 culture, OPG reduced TRAP positive reaction in a OPG dose-dependent manner. Additionally, the suppressive effect of OPG was enlarged by administration of HGF-CM. Moreover, LPS-stimulated HGF-CM did not suppressively affect osteoclastogenesis more than HGF-CM. IL-4 suppressively affected osteoclast differentiation in RAW264 and the IL-4 action was promoted by HGF-CM. The IL-4 effects also did not enhance LPS-stimulated HGF-CM.

**Conclusion:** Gingival fibroblasts might restrain the osteoclasts differentiation through OPG and possibly also IL-4. This inhibitory function of HGF in osteoclastogenesis, however, might be not only be regulated with suppressive mediators, but also with osteoclasts enhanced mediators such as IL-1 $\beta$ , IL-6, and MCP-1.

Topic: Basic Research: Aetiology and Pathogenesis

## P0059

### miRNA-146 is a negative regulator of IL-1 $\beta$ , IL-6 and TNF- $\alpha$ in human gingival fibroblasts

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**Aim:** In gingival tissues, lipopolysaccharide (LPS) from periodontopathic bacteria induces interleukin (IL)-1, IL-6, IL-10, and tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) through Toll-like receptors (TLRs). Although various microRNAs regulate immuno-inflammatory response, no miRNA has been reported so far to play an important role in periodontitis. The objective of this study is to measure miRNA expression in HGFs and explore miRNA-146 regulatory function in periodontal inflammatory response.

**Material and Methods:** MiRNA expression in HGFs was profiled by microarray before and after PgLPS stimulation to screen the TLR signaling related miRNA. HGFs were transfected with miRNA inhibitor. After obtaining stable and reliable transfection, the inflammatory cytokines secreted by HGFs were detected by ELISA (Enzyme-linked immunosorbent assay). Meanwhile, the regulation function of miRNA on the target molecule of TLRs pathway was tested by Western blot and quantitative PCR.

**Results:** The expression of miRNA-146 is significantly increased after PgLPS stimulation when compared to non-stimulated HGFs. MiRNA-146 inhibition can decrease miRNA-146 expression, which in turn promotes secretion of IL-1 $\beta$ , IL-6, and TNF- $\alpha$ . The result of quantitative PCR and Western Blot showed miRNA-146 inhibition enhances IRAK1 (Interleukin-1 receptor-associated kinase 1) expression and activation.

**Conclusion:** Our data suggest that Pg LPS induces miRNA-146 expression, which functions as a negative feedback regulator in periodontal disease.

## Topic: Basic Research: Aetiology and Pathogenesis

## P0060

## Effect of rhPDGF-BB on periodontal regeneration

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**Aim:** We investigated the cell kinetics during bone regeneration after guided tissue regeneration (GTR) in combination with application of recombinant human platelet-derived growth factor (rhPDGF-BB).

**Material and Methods:** Buccal dehiscence defects were surgically prepared on the mesial root surface of the premolars of 10 beagle dogs. The defects were divided into two groups: e-PTFE membrane and rhPDGF-BB were applied to the GTR/rhPDGF-BB group (n=10), and e-PTFE membrane were applied to the GTR group (n=10). The animals were sacrificed at 1, 2 or 8 weeks. To observe the location of proliferating cells, we performed immunohistological staining for proliferating cell nuclear antigen (PCNA). The distribution of osteogenetic cells was evaluated by assessing alkaline phosphatase (ALP) activity.

**Results:** In the GTR group at two weeks, a few PCNA-positive cells were observed in the tissues near blood vessels, and ALP activity was localized at the bottom of the defects. In the GTR/rhPDGF-BB group at two weeks, many PCNA-positive cells and ALP activity were located at the bottom of the defects and they were also spreading to the coronal portion of the defects. The percentage of PCNA-positive cells at two weeks was significantly higher in the GTR/rhPDGF-BB group than in the GTR group ( $p<0.01$ ).

**Conclusion:** These results suggest that GTR in combination with application of rhPDGF-BB promotes the proliferation of cells involved in bone regeneration in the early stages of wound healing.

## Topic: Basic Research: Aetiology and Pathogenesis

## P0061

## The role of TGF Beta 1 and VEGF in the pathogenesis of scleroderma

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**Aim:** Systemic sclerosis (SSc) or scleroderma is a rheumatic acquired disorder that typically results in the fibrosis of the skin and internal organs. The pathogenesis of this disorder includes inflammation, autoimmune attack, and vascular damage, leading to fibroblast activation. The aim of this study was to compare the gene expression profile, by immunohistochemical analysis, of TGFB-1 and VEGF mediators in 44 patients divided in two groups: Scleroderma and Control (CO).

**Material and Methods:** 44 patients were enrolled in this prospective clinical study. The collection of gingiva biopsies (2x2 mm) and periodontal ligament specimens was carried out during routine extraction for oral surgery therapy and processed for immunohistochemistry. The following primary antibodies were used: anti-TGF Beta1 and VEGF. Also, frequency distributions,

media and standard deviation (SD) were determined at baseline in each group to describe the clinical parameters (PD, CAL, CPITN, PI and BOP). The Kruskal Wallis and the Mann Whitney U and Wilcoxon Signed Rank Tests were carried out when comparing the clinical parameters between two groups.

**Results:** Gingival samples clearly showed a normal staining pattern for TGF-B1 in CO, whereas it appeared severely reduced in samples of patients with SSc. Immunofluorescence reactions performed using VEGF antibodies, staining patterns showed a higher intensity in SSc that observed in CO. Similar results were obtained on periodontal ligament.

**Conclusion:** The findings presented here make it clear that biomarker such as TGF B1 and VEGF have an important role in the orchestration of the immune response, which in turn influence the outcome of disease establishment and evolution.

## Topic: Basic Research: Aetiology and Pathogenesis

## P0062

## Wnt5a expression by Porphyromonas gingivalis LPS via NF-kappaB and STAT1

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**Aim:** Wnt signaling molecules play important roles in bone biology, apoptosis, chronic inflammation and wound healing. Recent studies have suggested the associations of these molecules with various diseases including cardiovascular diseases, rheumatoid arthritis and osteoarthritis. But there have been no reports on Wnt5a expression in periodontitis tissue. We previously demonstrated that Wnt5a mRNA expression was up-regulated in chronic periodontitis tissue when compared to healthy control tissue. In this study, we investigate what molecular mechanisms are involved in regulation of Wnt5a expression.

**Material and Methods:** Human monocytic cell line THP-1 were stimulated with Porphyromonas gingivalis (*P. gingivalis*) LPS. To investigate the involvement of NF- $\kappa$ B and JAK/STAT pathways in the modulation of Wnt5a expression, we performed inhibition assay, transfection, western blotting, luciferase assay and EMSA. The levels of Wnt5a mRNA were determined by real-time RT-PCR. To investigate the involvement of NF- $\kappa$ B and STAT1 in the modulation of Wnt5a expression, we performed Western blotting (WB) detection of proteins obtained through immunoprecipitation (IP).

**Results:** Wnt5a mRNA was expressed by THP-1 cells in response to *P. gingivalis* LPS. *P. gingivalis* LPS-mediated Wnt5a mRNA expression was inhibited by IKK inhibitor and dominant-negative I $\kappa$ B $\alpha$ . Binding of NF- $\kappa$ B to DNA was increased by *P. gingivalis* LPS stimulation. Wnt5a expression was inhibited by JAK/STAT and STAT1 inhibitor. Immunoprecipitation analysis demonstrated that STAT1 interacted with p65 by *P. gingivalis* LPS stimulation.

**Conclusion:** STAT1 may activate NF- $\kappa$ B and work in concert to promote Wnt5a production. These findings will help reveal the mechanism of molecular pathogenesis of periodontal disease.



Topic: Basic Research: Aetiology and Pathogenesis

## P0063

### Osteoconductivity of Mosaic-like Porous Ceramics Combined with Rat Bone Marrow Stromal Cells

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**Aim:** Recently, various hydroxyapatite (HA) ceramics are involved application as bone graft. However, the geometry of pores in a typical porous ceramics are in wide diversity and large variations among production lots. There, we have developed a new ceramics "Mosaic-like Porous Ceramics" (MLPC) which distribution of the porous is assured. The purpose of this study was to compare the MLPC and existing porous ceramics (HA-A and HA-B).

**Material and Methods:** Bone marrow stromal cells (BMSCs) were harvested from Fischer 344 - 7 weeks old male rats and BMSCs were seeded three different HA ceramics (MLPC, HA-A, and HA-B). The BMSCs/ceramics composites were cultured for 2 weeks in the presence of dexamethasone. The disks were prepared for ALP staining, biochemical analysis (ALP activity and osteocalcin content), and in vivo subcutaneous implantation study (histology, micro CT, and osteocalcin content analysis). Statistical analysis was performed using non-repeated measures ANOVA and the statistical significance level was set at  $P = 0.05$ .

**Results:** ALP staining showed that MLPC was penetrated dyeing deeper than other ceramics. Biochemical analysis and in vivo study showed MLPC was highest osteoconductivity among the three HA ceramic types.

**Conclusion:** MLPC showed higher osteogenic makers than other ceramics. This is considered that BMSCs were able to penetrate deeply into MLPC. These results demonstrated that MLPC could be ideal candidates for utilization in dental fields.

Topic: Basic Research: Aetiology and Pathogenesis

## P0064

### Clinical and laboratory assessment of effectiveness usage antioxidative drugs (mexidolum) preparation in treatment of patient with generalized periodontitis

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**Aim:** The study was conducted to determine the activity of free-radical oxidation, protective level of nitric oxide (NO) in gingival fluid in the patients with pathology of parodont.

**Material and Methods:** 65 patients and 30 controls were evaluated. Plaque index (OHI-S), gingival index (PI), bleeding on probing (SBI) were recorded. NO levels in gingival fluid were magnitudinal radiospectroscopically determined before and after complex treatment with antioxidative drugs (mexidolum).

**Results:** The received data demonstrate high grade of oxidative stress in the organism, low resources of antioxidative systems of the patients with pathology of parodont. Nitric oxide synthesis decreased in periodontal disease: light degree -  $44,65 \pm 1,32 \times 10^{-6} \text{M/l}$ ; middle degree -  $22,64 \pm 1,91 \times 10^{-6} \text{M/l}$ ; heavy degree -  $11,4 \pm 1,99 \times 10^{-6} \text{M/l}$ . After complex treatment with antioxidative drugs (mexidolum) NO

levels in gingival fluid significantly increase in several times: light degree - in 1,4; middle degree - in 4,2; heavy degree - in 11.

**Conclusion:** This study was the first report of evaluating NO metabolism in gingival fluid. The results of the research motivate inclusion of antioxidative drugs (mexidolum) into complex therapy of patients with generalized periodontitis.

Topic: Basic Research: Aetiology and Pathogenesis

## P0065

### Porphyromonas gingivalis infection modulates lipid profile by inducing PCSK9 production in murine model

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**Aim:** Periodontal disease increases the risk of atherothrombotic disease. While high levels of low density lipoprotein (LDL) cholesterol are considered to be involved, the underlying mechanisms are largely unknown. Recent studies have demonstrated that proprotein convertase subtilisin/kexin type 9 (PCSK9) plays a critical role in circulating LDL cholesterol level by promoting LDL receptor (LDLR) degradation. The aim of the present study is to analyze the expression of PCSK9 in murine model infected with *Porphyromonas gingivalis*, which is a representative periodontopathic bacterium and is a significant risk factor for coronary heart disease.

**Material and Methods:** C57BL/6 mice were intraperitoneally infected with  $10^9$  CFU of *P. gingivalis* strain W83. Gene expression of PCSK9 in the liver was analyzed by real-time PCR. Serum Amyloid A (SAA) and serum PCSK9 levels were measured by ELISA. Protein expression of LDLR in the liver was analyzed by Western blotting, and serum lipid profiles were determined by a commercial laboratory.

**Results:** PCSK9 mRNA level in the liver and serum PCSK9 and SAA levels were significantly upregulated in *P. gingivalis*-infected mice. Expression of LDLR protein in the liver was decreased, suggesting reduced clearance of cholesterol by circulation. LDL cholesterol level was significantly upregulated in *P. gingivalis*-infected mice.

**Conclusion:** *P. gingivalis* infection can lead to increased PCSK9 production in the liver, degradation of LDLR, and eventual elevation of LDL cholesterol in the serum. However, further studies are required to clarify the mechanisms by which periodontal infection affects PCSK9 production and subsequent lipid profiles.

Topic: Basic Research: Aetiology and Pathogenesis

## P0066

### Induction of Differentiation into Vascular Endothelial Cells by FGF-2 on Cells Derived from Periodontal Ligament

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**Aim:** Periodontitis is an infectious disease causing the loss of periodontium. Blood supply is indispensable in order to reconstruct the lost periodontal tissue. Recently, regeneration of the periodontal ligament (PDL) tissue is reported to be promoted by basic fibroblast growth factor (FGF)-2. FGF-2 possesses effects on controlling cell proliferation, migration, and differentiation, and also has a role in angiogenesis. However, it remains to be clarified how FGF-2 promotes differentiation of PDL derived cells into vessel like structures. This study evaluated the potential of the cells derived from PDL in differentiating into vascular endothelial cells and mechanisms how FGF-2 controlled the multipotency of the cells.

**Material and Methods:** The swine PDL cell fibroblast cell line, TesPDL3, was cultured with F-12 Ham's medium supplemented with 10% fetal bovine serum, with or without 20 ng/ml FGF-2. The ability of the TesPDL3 to proliferate with the stimulation of vascular endothelial growth factor (VEGF)-A was evaluated by cell counting Kit-8. The status of the expression of vascular endothelial cell specific markers in the TesPDL3 cells was evaluated using real time polymerase chain reaction (RT-PCR), flow cytometry and immunofluorescent analyses.

**Results:** Proliferation of the TesPDL3 cells were enhanced in response to VEGF-A stimulation when cultured with FGF-2 compared with cultured without FGF-2. The swine mRNA expression and protein expression level of endothelial cell specific makers were upregulated when cultured with FGF-2.

**Conclusion:** We showed that PDL fibroblasts had the potential to differentiate into endothelial cells. Moreover, FGF-2 may play an important role in vasculogenesis of PDL derived multipotential cells.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0067

#### Immunohistochemical analysis of lymphocyte subpopulation in normal gingiva and peripheral giant cell granuloma.

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**Aim:** The peripheral giant cell granuloma (PGCG) of the oral cavity is a relatively common non-neoplastic inflammatory lesion of gingival tissues. Both T- and B- lymphocytes are present in sites of healthy and diseased gingival tissues and are considered to play an essential role in the pathogenesis of the periodontal disease. The aim of this study was to quantify lymphocyte subpopulations (CD3, CD4, CD8, CD20 and CD79a) in PGCG and compare them with those in normal gingival tissues.

**Material and Methods:** Seventeen patients with systemically healthy and non-smoker were included the study. The biopsies of diseased gingival tissues (test group) were collected during surgical elimination of PGCG, and the other biopsy material (normal gingival tissue) was obtained from the same patient (control group). The lymphocyte subpopulations were analysed by using an immunohistochemical method.

**Results:** CD3, CD4, CD8, CD20 and CD79a cells were detected in all specimens from the test and control groups. The present study revealed significant differences between proportion of lymphocyte cells observed in group test and control. In the test group, proportion of CD4 cells (54%) was significantly increased

( $P < 0.01$ ) when compared to control group (20%). However, in the test group, proportion of CD20 cells (9.5%) was significantly decreased ( $P < 0.01$ ) when compared to control group (30.5%).

**Conclusion:** The present study showed the presence of both T- and B-cells in PGCG and normal gingival tissue, but in different proportions. These differences may reflect a difference in the immunopathology of diseased and healthy gingival tissues.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0068

#### Salivary interleukin-6 and tumor necrosis factor-alpha in patients with chronic and aggressive periodontitis

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**Aim:** The majority of studies examining cytokines as diagnostic biomarkers for periodontal destruction have been conducted using GCF. Saliva is easily available and has the potential as a diagnostic tool for periodontal disease. Previous studies on salivary levels of cytokines were conflicting therefore the aim was to measure salivary concentrations of IL-6 and TNF- $\alpha$  in patients with chronic (GCP) and aggressive (GAgP) periodontitis, compare them between each other and to healthy controls.

**Material and Methods:** Whole saliva samples were collected from 58 subjects: GAgP (n=17), GCP (n=16), and two healthy control groups (n=12, for GAgP; n=13, for GCP). Periodontal clinical measurements were taken, and IL-6 and TNF- $\alpha$  were measured by ELISA.

**Results:** Significantly lower levels of IL-6 were found in the GAgP group (mean: 27.35 pg/ml) than in the control group (mean: 38.08 pg/ml;  $P = 0.024$ ). TNF- $\alpha$  showed no statistical significance. Mean salivary levels of TNF- $\alpha$  were significantly lower in the GCP group (mean: 18.81 pg/ml) than in the control group (mean: 30.54;  $P = 0.001$ ). IL-6 showed no statistical significance. Spearman rank correlation didn't reveal correlation between concentrations of IL-6 and TNF- $\alpha$  and clinical parameters (BOP, PD, CAL and teeth number).

**Conclusion:** Our data indicate that salivary levels of IL-6 and TNF- $\alpha$  could not be used as a tool to distinguish GAgP from GCP. The data puts into question the validity of measuring salivary levels of IL-6 and TNF- $\alpha$  as markers of disease activity. Future studies with larger sample sizes are needed to verify the results.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0069

#### Prolyl hydroxylase inhibitors increase the production of vascular endothelial growth factor in human dental pulp cells

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**Aim:** Prolyl hydroxylase (PHD) inhibitors can induce a pro-angiogenic response that stimulates regeneration of soft and hard

tissue. Whether PHD inhibitors can stimulate pulp regeneration is however unknown. The purpose of this study was to evaluate the effects of PHD inhibitors, on the pro-angiogenic capacity of human dental pulp cells (DPCs).

**Material and Methods:** To test for the response of DPCs to PHD inhibitors, DPCs were exposed to dimethylxalylglycine (DMOG), desferrioxamine (DFO), L-mimosine (L-MIM), and cobalt chloride (CoCl<sub>2</sub>). The effect on viability, proliferation, and protein synthesis was assessed by MTT, 3[H]thymidine, and 3[H] leucine incorporation assays. The effect on the pro-angiogenic capacity was measured by immunoassays for vascular endothelial growth factor (VEGF). To assess whether PHD inhibitors can induce VEGF production under the influence of capping material, DPCs were treated with the PHD inhibitors in the presence of supernatants from calcium hydroxide.

**Results:** We found that PHD inhibitors, at high concentrations, reduced viability, proliferation and protein synthesis of DPCs. At non toxic concentrations, PHD inhibitors stimulated the production of VEGF in DPCs. Furthermore stimulation with PHD inhibitors increased the production of VEGF when cells were cultured in the presence of supernatants from calcium hydroxide.

**Conclusion:** Overall, our results suggest that PHD inhibitors can increase VEGF production in cells from the dental pulp provoking a pro-angiogenic environment. Whether this increased pro-angiogenic environment translates in enhanced pulp regeneration requires preclinical studies.

Topic: Basic Research: Aetiology and Pathogenesis

**P0070**

### Anandamide Reduced Cytokine Expression in Periodontal Ligament Cells in Vitro

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**Aim:** Endocannabinoids, lipid mediators derived from arachidonic acids, are found and associated with multiple regulatory functions in several tissues. Anandamide (AEA) is one of the main endocannabinoids which recently suggested having some immunosuppressive and anti-inflammatory effects. Previously, a detectable level of AEA was reported at the gingival crevicular fluid of periodontitis patients, but association between periodontal diseases and AEA remains still unclear. The aim of the present study was to examine effects of AEA on the proliferation/viability and cytokine production of periodontal ligament cells (PDLs) in the presence and absence of Porphyromonas gingivalis lipopolysaccharide (Pg-LPS) stimulation.

**Material and Methods:** The proliferation/ viability of PDLs were measured by 3,4,5-dimethylthiazol-2-yl-2,5-diphenyl tetrazolium bromide (MTT) assay, in the presence/absence of 1 µg/ml of Pg-LPS. Gene expression levels of interleukin-6 (IL-6), interleukin-8 (IL-8), and monocyte chemotactic protein-1 (MCP-1) were quantified using real-time PCR.

**Results:** No significant effect of AEA (10-0.1µM) on the proliferation/viability of PDLs was observed. AEA in 10µM significantly reduced the production of pro-inflammatory mediators (IL-6, IL-8 and MCP-1) induced by Pg-LPS in PDLs. However this effect was not observed in lower AEA concentrations (1-5 µM).

**Conclusion:** AEA seems to play an important role on modulation

of periodontal inflammation via regulation of cytokine release from PDLs. Further studies are needed for better understanding of the extents of this anti-inflammatory effect and the therapeutic potential of AEA in periodontal disease treatment.

Topic: Basic Research: Aetiology and Pathogenesis

**P0071**

### Association of periodontopathogenes identified from dental plaque by PCR technique with composite Interleukin-1 Genotype and clinical parameters in chronic periodontitis

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**Aim:** The present study aimed to assess the presence of main types of microorganisms involved in the aetiopathogenesis of chronic periodontitis Actinobacillus actinomycetemcomitans, Porphyromonas gingivalis, Prevotella intermedia, Tannerella forsythia and Treponema denticola with PCR technique. Also we have aimed to determinate associations of founded bacteria with host's genotype (the presence of composite IL-1 genotype IL-1A Allele2(-889)/IL-1B Allele2(+3954) and HLA-DR4) and clinical parameters.

**Material and Methods:** The examined group consisted from 20 subjects with diagnosed chronic periodontitis. Clinical parameters like gingival index (GI), plaque index (PI), bleeding on probing (BOP), periodontal pocket depth (PPD) and clinical attachment lost (CAL) were determinates in each patients. Subgingival dental plaque was collected using a sterilized paper point. We used ParodontosePlus test, reverse hybridization kit, for the detection of periodontal marker bacteria, as well as for the detection of composite Interleukin -1 Genotype and HLA-DR4 coding DRB1\*04 alleles.

**Results:** We found that most of patients, 40% had presence of 3 types of periopathogenes at the same time, 35% had 4 types of periopathogenes and 5 types of periopathogenes had only 5% of examinees, etc. We have determinated associations between composite genotype and Prevotella intermedia ( $\chi^2=4,85$ ,  $p=0,03$ , Exp(B)=6,15/95%CI 0.61-62,23), and between presence of composite genotype and HLA-DRB1\*04 ( $\chi^2=4,85$ ,  $p=0,03$ ). We have determinated associations between Actinobacillus . actinomycetemcomitans and GI, PPD and CAL ( $\chi^2=8,09$  and  $p=0,004$ ). For  $\chi^2=8,17$  and  $p=0,02$  had associations between PI and Prevotella intermedia and composite genotype together.

**Conclusion:** Assessment of different types of periodontopathogenes and host's genotype is important for early detection, prevention and treatment of periodontal disease.

Topic: Basic Research: Aetiology and Pathogenesis

**P0072**

### Effects of mechanical stress on the proliferating activity of human periodontal ligament fibroblasts

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Beijing/China

**Aim:** To investigate the effects of the different mechanical stress on the proliferating activity of human periodontal ligament fibroblasts (HPLF).

**Material and Methods:** The cells were incubated under continuous pressure of 0.25Mpa, 0.5Mpa and 1.0Mpa for 30min respectively, or cells are treated for 10min, 30min and 50min respectively with 1.0Mpa pressure. The proliferation of cells was studied with MTT assay at 6h, 12h, 18h, 24h, 30h and 36h after stimulation.

**Results:** The cells subjected to 0.25Mpa and 0.5Mpa pressure had no difference in proliferation compared with control group ( $p>0.05$ ). The cells treated for 30min and 50min with 1.0Mpa pressure had statistical difference ( $p<0.05$ ), the proliferation of that groups was decreased after 6h, reached the bottom at 12h ( $p<0.05$ ), and returned to the original level at 24h after stimulation.

**Conclusion:** The proliferation of HPLF had certain relationship with the values and duration time of pressure. With the pressure values getting stronger and duration time longer, their proliferation inclined. But these reactions were reversible.

Topic: Basic Research: Aetiology and Pathogenesis

**P0073**

### Interleukin-8 gene variations associated with subgingival bacterial colonization in chronic and aggressive periodontitis in the Czech population

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**Aim:** The aim of this study was to associate four single nucleotide polymorphisms in interleukin-8 (IL-8) with periodontitis and subgingival bacterial colonization in the Czech population.

**Material and Methods:** In this case-control association study, a total of 514 unrelated subjects were included. Genomic DNA of 288 patients with chronic periodontitis (CP), 64 patients with aggressive periodontitis (AgP), and 162 healthy/non-periodontitis controls was genotyped using real-time PCR method for IL-8 gene polymorphisms (-845C/T RS2227532, -251A/T RS4073, +396G/T RS2227307, +781C/T RS2227306). Subgingival bacterial colonization (Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Prevotella intermedia, Tannerella forsythia, Treponema denticola, Peptostreptococcus micros, Fusobacterium nucleatum) in subgingival pockets was investigated by the DNA-microarray based on a periodontal pathogen detection kit in a subgroup of subjects.

**Results:** Allele and genotype frequencies of all investigated polymorphisms were not significantly different between the subjects with CP and/or AgP and controls ( $P<0.05$ ). However, F. nucleatum occurred less frequently in non-periodontitis individuals positive for T allele of IL-8 +396G/T variant ( $P<0.05$ ). In contrast, IL-8 -251 T allele carriers had an increased odds ratio (OR) for individual presence of A. actinomycetemcomitans in AgP patients ( $P<0.01$ ) and an increased OR was also found for the presence of T. forsythia in CP patients for T allele of IL-8 +781 ( $P<0.05$ ).

**Conclusion:** Although the IL-8 variants could be shown to be associated with subgingival colonization with A. actinomycetem-

comitans in AgP and with T. forsythia in CP, our findings indicate that these polymorphisms alone are not associated with susceptibility to CP or AgP in the Czech population. Supported by the project IGA NS9775-4.

Topic: Basic Research: Aetiology and Pathogenesis

**P0074**

### Protease-activated receptor-1 expression is increased in chronic periodontitis patients after non-surgical periodontal treatment

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São Paulo/Brazil

**Aim:** Protease activated receptor 1 (PAR-1) seems to play a role in vascular matrix deposition after injury, bone repair and homeostasis of periodontal tissues, as well as proliferation of gingival fibroblasts. The objectives of this study were to investigate the PAR-1 mRNA expression in human chronic periodontitis and to evaluate whether periodontal treatment affects its expression.

**Material and Methods:** Gingival crevicular fluid (GCF) samples and clinical parameters consisting of measuring probing depths (PD), clinical attachment loss (CAL), bleeding on probing (BOP), and gingival (GI) and plaque index (PI) were collected from periodontally healthy (control) and moderate chronic periodontitis patients before and 45 days after periodontal non-surgical treatment. PAR-1 mRNA at the GCF was evaluated by real time-PCR (qPCR).

**Results:** Clinical parameters (PD, CAL, BOP, GI, and PI) were significantly improved after periodontal therapy ( $p<0.01$ ). The q-PCR analysis showed that before periodontal therapy, PAR-1 mRNA levels in chronic periodontitis were not statistically ( $p<0.05$ ) different from controls. Periodontal treatment led to a substantially increase of PAR-1 expression in chronic periodontitis ( $p<0.05$ ).

**Conclusion:** PAR-1 mRNA levels in chronic periodontitis are not different from control patients. Non-surgical periodontal treatment resulted in increased expression of PAR-1 in chronic periodontitis patients, therefore suggesting its role in periodontal tissue repair.

Topic: Basic Research: Aetiology and Pathogenesis

**P0075**

### Gingipain from Porphyromonas gingivalis is associated to Protease-activated receptor-2 expression in chronic periodontitis patients.

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**Aim:** Gingipain, a protease produced by Porphyromonas gingivalis (Pg), an important pathogen in chronic periodontitis, has a potential role in the activation of the proinflammatory



receptor protease-activated receptor-2 (PAR-2). The aim of this study was to evaluate whether gingipain levels are associated to PAR-2 gene expression before and after non-surgical periodontal therapy in chronic periodontitis patients.

**Material and Methods:** Moderate chronic periodontitis patients and periodontally healthy patients (aged between 33 and 53 years old) were recruited according to inclusion and exclusion criteria, and matched according to gender and age. Clinical evaluation consisted of measuring probing depth (PD), clinical attachment loss (CAL), bleeding on probing (BOP), gingival (GI) and plaque index (PI). Gingival crevicular fluid (GCF) samples and clinical parameters were collected before and 6 weeks after periodontal non-surgical treatment. Gingipain and PAR-2 expression were assessed by real time polymerase chain reaction (q-PCR).

**Results:** Periodontal treatment led a significant improvement of clinical parameters: PD, CAL, BOP, GI, PI ( $p < 0.01$ ). Compared to control patients, chronic periodontitis patients presented increased gingipain and PAR-2 expression at the GCF cells ( $p < 0.01$ ). In addition, periodontal treatment led to a significant decrease in the gingipain and PAR-2 gene expression ( $p < 0.01$ ), reaching mRNA levels similar to the control group ( $p > 0.05$ ).

**Conclusion:** Increased levels of gingipain are associated to increased PAR-2 expression in chronic periodontitis patients, and periodontal treatment leads to decreased mRNA levels of both, gingipain and PAR-2, therefore suggesting that this protease might play an important role as PAR-2 activator during periodontal breakdown.

#### Topic: Periodontal Medicine

### P0076

#### GCF Chemokine Levels of Patients with Gingival Inflammation and Metabolic Syndrome

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**Aim:** Metabolic syndrome (MS) is a common precursor to type 2 diabetes which is characterized by the co-occurrence of several cardiovascular risk factors. Current data support a potential association between subclinical inflammation characteristic of MS and periodontal disease. The aim of the present study was to determine the gingival crevicular fluid (GCF) levels of monocyte chemotactic protein-1 (MCP-1), regulated upon activation, normal T-cell expressed, and secreted (RANTES), macrophage migration inhibitory factor (MIF) and interleukin-8 (IL-8) in subjects with metabolic syndrome.

**Material and Methods:** Subjects having a diagnosis of MS according to the ATP III criteria were enrolled and clinical periodontal parameters were recorded. Two GCF samples were collected from each MS subject with gingivitis (MSG) ( $n=20$ ) or healthy (MSH) ( $n=20$ ) and pooled. Age and sex-matched subjects without metabolic syndrome exhibiting gingivitis (NMSG) ( $n=20$ ) and periodontal health (NMSH) ( $n=20$ ) served as controls. GCF chemokine levels were determined by ELISA.

**Results:** MS groups had elevated blood pressure, triglyceride, waist circumference, fasting glucose and HOMA values in comparison to controls ( $p < 0.05$ ). Clinical periodontal parameters were higher in gingivitis groups when compared to those of healthy groups ( $p < 0.05$ ). MCP-1 levels of both MSG and NMSG groups was higher than the MSH and NMSH groups ( $p < 0.05$ ).

MSG group had elevated RANTES levels in comparison to all other groups ( $p < 0.05$ ).

**Conclusion:** Subclinical systemic inflammation associated with MS and adipose tissue-derived RANTES may lead to altered RANTES levels in GCF in case of gingival inflammation and thus may be one of the molecular mechanisms linking MS and periodontal disease.

#### Topic: Periodontal Medicine

### P0077

#### Oral Health status in patients with rheumatoid arthritis: the OSARA study

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**Aim:** The aim of the study was to describe the dental, periodontal and oral prosthetic status of patients with rheumatoid arthritis (RA).

**Material and Methods:** The study was conducted from June 2010 to March 2011 in the Rheumatology Day Care Department of the University Teaching Hospital, Toulouse. Activity of the RA was defined according to disease activity score 28 (DAS28). 74 subjects with RA were included. Periodontal status was determined using measurements of pocket depth, attachment loss and bleeding on probing. Periodontal Inflamed Surface Area (PISA) and Periodontal Epithelial Surface Area (PESA) were calculated. Periodontitis was defined as severe, moderate, weak or absent according to Page and Eke's definition.

**Results:** The study population was  $60.3 \pm 11.9$  years old with a sex ratio of 1:3 between men and women. 22.2% of the subjects had high RA activity ( $\text{DAS28} > 5.1$ ) and 48.6% moderate RA ( $3.2 < \text{DAS28} \leq 5.1$ ); 93.2% were treated by biotherapy. The number of teeth replaced by fixed prostheses was  $4.8 \pm 4.8$  and by removable prostheses was  $7.1 \pm 10.5$ , while the mean number of missing or non-functional teeth was  $5.4 \pm 4.2$ . The mean PISA was  $291.9 \text{ mm}^2 \pm 348.7$  and the PISA:PESA ratio was  $33.2\% \pm 24.2\%$ . 94% of patients had periodontitis, which was severe in 46% and moderate in 48%.

**Conclusion:** Oral treatment, both prosthetic and periodontal, is necessary for RA patients in a public health perspective. This dramatic oral health status needs better cooperation between patients, associations of RA patients, medical practitioners and dentists. This study highlights the need for prevention and for adequate dental care to improve global and oral quality of life.

#### Topic: Periodontal Medicine

### P0078

#### Oral and gingival lichen planus : case report with global medical care and three-year follow-up

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Rabat/Morocco

**Aim:** To demonstrate the interest of continuous monitoring of patients with gingival lichen planus and collaborating with dermatologist and internist for global medical care.

**Material and Methods:** Case report: Mrs R.J. is a 57 year-old female who was referred by her dermatologist to the Periodontology department for a severe and painful gingival inflammation. Physical examination revealed the presence of skin lesions diagnosed as lichen planus by the dermatologist. The patient has reported dysphagia and stomach disturbances. The oral examination, revealed the presence of white squamous lesions on the gingiva and on the inside face of the cheeks. Histological examination confirmed the diagnosis of gingival lichen planus. Treatment was administered in collaboration with both the dermatologist and the internist. The treatment plan has gone through etiological phase to eliminate plaque retention factors and reduce gingival inflammation. local treatment was prescribed to which the patient responded very slightly. She presented transient disease flare. We continued to monitor the oral status until the internist prescribed systemic corticosteroids leading to a favorable significant clinical outcome.

**Results:** Discussion: Lichen planus is a chronic inflammatory muco-cutaneous disease characterized by a keratinization disorder. This condition is more common in women than in men. Before treatment, control of local predisposing factors is mandatory. A regular and permanent dental care is necessary to track the lichen planus evolution, detect and intercept any malignant transformation.

**Conclusion:** The gingival and oral lichen planus is a chronic inflammatory disease that requires global medical care. The risk of carcinomatous transformation of lichen planus lesions justify regular and long-term monitoring.

#### Topic: Periodontal Medicine

### P0079

#### Association of periodontal disease with rheumatoid arthritis: a case-control study

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**Aim:** The aim of the present case-control study was to evaluate the periodontal status of a group of non-smoker patients with rheumatoid arthritis (RA) in comparison to a group of non-smokers, healthy controls matched for age, gender, socio-economic status and oral hygiene, in order to investigate a possible association between the two conditions.

**Material and Methods:** Forty-one patients with rheumatoid arthritis and 30 healthy controls, all non-smokers, matched for age, gender, socio-economic status and oral hygiene status were examined. Plaque index, gingival index, number of teeth, bleeding on probing, probing depth and clinical attachment level were assessed.

**Results:** Bleeding on probing, clinical attachment loss and number of missing teeth were significantly higher among patients with RA compared to healthy controls, ( $p=0.002$ ,  $0.007$ ,  $0.004$  respectively). Periodontitis, defined as 6 sites with CAL  $>4$  mm and PD  $>5$  mm, was more frequent among patients with RA (90% vs. 56.7%) compared to controls ( $p=0.001$ ). 58.5 % of RA patients had CAL $>3$  mm in 30-100% of sites, compared to only 23.3 % of healthy controls ( $p=0.002$ ). Patients with RA had 7 times higher odds for periodontitis (2.00-24.92, 95% CI). The association (OR 6.38, 1.32-30.76, 95% CI) remained significant after adjustment for gender, age, plaque index, gingival index and smoking habits for former smokers ( $p=0.021$ ).

**Conclusion:** Periodontitis was more common and severe in patients with rheumatoid arthritis compared to healthy controls. There was a strong association between the two conditions, which remained significant after adjustment for possible confounding factors.

#### Topic: Periodontal Medicine

### P0080

#### Salivary biomarkers in gingival crevicular fluid of rheumatoid arthritis patients with periodontal disease

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**Aim:** This study was undertaken to compare periodontal conditions, gingival crevicular fluid (GCF) levels of tissue-type and to test the hypothesis that rheumatoid arthritis (RA) influenced levels of salivary biomarkers of periodontal disease.

**Material and Methods:** Twenty-three RA patients, 17 systemically healthy patients with periodontal disease (PD), and 17 systemically and periodontally healthy subjects were recruited. GCF samples were obtained from two single-rooted teeth. Full-mouth clinical periodontal measurements were recorded at six sites/tooth. GCF samples were analysed using relevant ELISA kits. Data were tested statistically by appropriate tests.

**Results:** The arthritis and healthy groups had significantly less oral disease than the periodontitis group, with the arthritis group having significantly more sites bleeding on probing (BOP) than matched controls. Salivary levels of MMP-8 and IL-1b were significantly elevated in the periodontal disease group, and IL-1b was the only biomarker with significantly higher levels in the arthritis group compared with controls.

**Conclusion:** The coexistence of RA and periodontitis does not seem to affect clinical periodontal findings or systemic markers of RA. Similar inflammatory mediator levels in RA and PD groups, despite the long-term usage of corticosteroids, non-steroidal anti-inflammatory drugs, suggest that RA patients may have a propensity to overproduce these inflammatory mediators.

#### Topic: Periodontal Medicine

### P0081

#### The assessment of peri-implant soft tissue around different osseointegrated dental implants in patients with a history of periodontitis.

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**Aim:** To assess the peri-implant soft tissue around restored implants in patients with and without a history of periodontitis and the survival and success of the implants.

**Material and Methods:** This was a retrospective recall study in the Periodontology Department at the Eastman Dental Hospital & Institute. Of 131 patients contacted, 97 patients were seen and had 334 implants placed in the last 13 years, and restored

for at least 1 year with supporting x-rays. The patients recalled were separated into 2 groups, ones who had lost teeth due to periodontitis (Group B) and those who had lost teeth for other reasons (Group A). The clinical notes were examined for patient demographics, data related to their periodontal health and implant treatment. A radiographic assessment was also made.

**Results:** The average follow up was 5.66 years (1-13 years). The prevalence of peri-implant mucositis and peri-implantitis was 85.45% and 5.45% in Group A, and 90.48% and 9.52% in Group B respectively. The survival rate was 97.94% in both groups and success rates were 92.73% in Group A and 78.57% in Group B. Implants placed in the posterior maxilla were found to be a confounding risk factor.

**Conclusion:** This study shows a high prevalence of peri-implant mucositis and a low prevalence of peri-implantitis, with no statistical significance between the 2 groups. Survival rates in both groups were high; however, patients with a history of periodontitis had a lower success rate (78.57%) which was significantly different ( $p=0.043$ ). Implants in the posterior maxilla also had a lower success rate, especially in patients with a history of periodontitis.

## Topic: Periodontal Medicine

### P0082

#### Periodontitis Prevalence in a Diabetes Mellitus (Type I and Type II) population: a cross-sectional study.

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**Aim:** To ascertain the prevalence of periodontitis in a cross sectional survey of individuals with diabetes (type I (T1DM) and II (T2DM)).

**Material and Methods:** 630 consecutive adult suffering from diabetes were recruited from outpatient clinics of the Endocrinology Clinic of University College London Hospital in London, UK. All individuals who consented to this study received a basic periodontal examination (BPE) (CPITN modification) by a single calibrated examiner. A series of other parameters were also recorded (including age, gender, smoking status, ethnicity, and body mass index). Diagnosis of periodontitis was defined both by presence of BPE scores of 3 or 4. Differences in periodontal parameters among various subgroups were analysed by ANOVA or paired t-test as appropriate. SPSS statistical software package (v.17) was used.

**Results:** Of the 630 patients (374 males and 276 females) included in the study 41.1% of the subjects were diagnosed with T1DM while 58.9% were diagnosed with T2DM. There was a statistically significant difference in the prevalence of PD in the two sub-populations. Indeed T2DM subjects had statistically higher prevalence of PD both when defined as the presence of at least a BPE 3 (35.6% vs. 9.7%,  $p<0.0001$ ) or BPE 4 (24.5% vs. 16.8%,  $p<0.0001$ ) when compared to T1DM individuals.

**Conclusion:** These results confirm the high prevalence of PD in a DM population. T2DM individuals presented with higher prevalence of PD compared to T1DM.

## Topic: Periodontal Medicine

### P0083

#### Evaluation of the Oral Health Status in Hematological Diseases: A Cross-Sectional Study Introduction

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**Aim:** Hematologic diseases have oral symptoms and complications and are prevalent. The main significant oral complications of hematologic diseases are oral infections, prolonged bleeding time and mucosal lesions. The periodontal and mucosal status of hematology patients can vary throughout the stages of treatment. Aim of this study is to evaluate the periodontal and mucosal status of patients with various types and treatment stages of hematologic diseases treatment.

**Material and Methods:** 72 women 128 men in total, 200 patients treated in hematology clinic were included in the study. Treatment phase of haematological patients, demographic data, the (pocket depth, bleeding on probing were recorded and the presence of lesions of oral mucosa were assessed by using oral toxicity scale. The distribution of periodontal and mucosal status according to the hematologic treatment modalities were determined and analysed.

**Results:** Forty-six percent of the patients were acute leukemia, 35% lymphoma types, 18,5% other hematological disorders. Seven% of them were evaluated before the chemotherapy period, 21% during the chemotherapy, 11% after chemotherapy, 13% and 37%, before and after hematopoietic cell transplantation, 11% therapy for other systemic problems period. The distribution of mucosal lesions were 8.5% mucositis with different degrees, 17% lichenoid-like alterations and 12,5% with various mucosal alterations. The mean pocket depth  $1,76 \pm 0,70$ .

**Conclusion:** Within the limits of this study, not only in hematologic diseases but the treatment modalities were found as having effect on the oral health status.

## Topic: Periodontal systemic interactions

### P0084

#### Chronic periodontitis and atherosclerosis: microbiological analysis of bacterial and viral species in periodontal pockets and carotid atheromatous plaques

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**Aim:** The aim of this study was to compare periodontal pathogens and viruses detected in periodontal pockets and in carotid atheromatous plaques harvested from the same patients.

**Material and Methods:** The study population consisted of 33 subjects, recruited among 127 patients scheduled for carotid endoarterectomy. Inclusion criteria were the presence of at least 12 teeth and a Periodontal Screening Recording code of 4 in at least four sextants. Exclusion criteria were systemic antibiotics intake and periodontal treatment in the last six months. A periodontist recorded baseline full mouth plaque and bleeding Score, pocket



depth (PPD) and clinical attachment level (CAL) on six sites/tooth. The deepest site with PPD  $\geq 6$  mm and BOP positive was selected in each sextant for microbial sampling (paper points technique). DNA of *A.actinomycetemcomitans*, *P.gingivalis*, *P.intermedia*, *T.forsythia*, *T.denticola*, *F.nucleatum*, *P.intermedia*, *C.rectus*, *P.micros*, *E.corrodens* and *Capnocytophaga* sp. was analyzed with a qualitative PCR. HCMV and EBV were amplified with a real-time quantitative PCR.

**Results:** Mean age was  $68.73 \pm 8.75$  years. Average PPD and CAL were  $4.70 \pm 0.9$  mm and  $6.1 \pm 0.65$  mm, respectively. Mean PPD and CAL at the selected sample sites were  $8.15 \pm 1.50$  mm and  $8.52 \pm 1.62$  mm. *P.gingivalis*, *T.forsythia*, *F.nucleatum* were the pathogens most frequently detected in subgingival samples (75.76%, 72.73% and 93.94%, respectively). Viral DNA (from EBV only) was isolated in 12 periodontal samples (36.36%). Bacterial DNA was never detected in atheromatous samples, while EBV DNA was isolated in two subjects (6.06%).

**Conclusion:** In contrast with other published evidences this study fails to confirm the presence of periodontal pathogens in atheromatous carotid lesions.

#### Topic: Periodontal systemic interactions

### P0085

#### Title: A Study of the Association of Malaria Parasite and ABO blood Groups with Aggressive Periodontitis in Nigerians - A Preliminary Study

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**Aim:** Aggressive Periodontitis is a rare form of periodontitis which has been associated with aetiological factors such as genetic predisposition, *Aggregatibacter actinomycetemcomitans*, and blood group B. It seems to have a racial predisposition being more common among blacks, particularly people of West African origin. The role of endemic factors such as malaria is yet to be investigated in aggressive periodontitis. The aim of this study was to explore the associations of malaria parasites and ABO blood groups with aggressive periodontitis.

**Material and Methods:** A case-control study on localized aggressive periodontitis patients and age and gender matched controls. Microbiological and hematological tests were performed to determine the presence of malaria parasites and ABO blood groups respectively. Data entry and analysis were done with Epi info 2007 software. Chi square test of analysis was used to determine differences. It is significant if  $p < 0.5$

**Results:** Eight LAgP patients and 9 age and gender-matched controls were seen. About 75% of the patients were positive for *Plasmodium Falciparum* malaria parasite, and in 22.2% of the controls. This difference was statistically significant ( $p=0.044$ ). The prevalence of malaria infection was not significantly associated with age ( $p = 0.44$ ) or gender ( $p = 0.34$ ) of the subjects.

**Conclusion:** This preliminary study showed a high prevalence of malaria parasites among patients with aggressive periodontitis. Studies with larger sample sizes may be needed to further investigate the relationship between aggressive periodontitis and malaria infection

#### Topic: Periodontal systemic interactions

### P0086

#### Neutrophil bactericidal functions prior and after periodontal intervention in diabetics

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**Aim:** Polymorphonuclear neutrophils (PMN), members of the innate branch of the immune system, form the first line of defense against invaders (e.g. bacteria, fungi or foreign particles). Enzymes such as neutrophil elastase have proteolytic activity capable to degrade these entities. In addition, as well as mandatory in the progress of phagolysosomal enzyme activation, reactive oxygen species (ROS) have microbicidal potential. The objective of this study was to evaluate stimulus depending elastase activity (EA) and ROS production by PMN from individuals with derailed diabetes mellitus type II and chronic periodontitis (DM2+CP) in comparison to a periodontitis cohort (CP) prior and after full mouth decontamination (FMD) as well as controls (C), respectively.

**Material and Methods:** After IRB-approval, 30 individuals participated in this prospective clinically controlled trial. Peripheral blood was sampled and PMN isolated as previously published. As standard for early cellular function and viability cells were co-stained with Indo-1-AM<sup>®</sup> a probe for 2nd messenger cytoplasmic calcium. Supernatant EA were assessed with DQ-green-BSA<sup>®</sup> and ROS with DCF-green-BSA<sup>®</sup> (Life-Technologies, Darmstadt). EA and ROS assays were performed with Indo-1-AM<sup>®</sup> stained PMN in our Hitachi-F7000<sup>®</sup> spectrofluorimeter.

**Results:** Compared to controls (C), EA and ROS formation were suppressed by 20% in DM2+CP ( $p < 0.05$ , ANOVA). EA and ROS both significantly increased after FMD to reach C-levels ( $p \leq 0.01$ ). Furthermore hematological parameters in DM2+CP individuals significantly declined (median\_HbA1c by 0.76%;  $p \leq 0.05$  – median\_FPG by 62mg/dl;  $p \leq 0.05$ ).

**Conclusion:** In this longitudinal intervention study derailed diabetic conditions showed significant improvement. In addition, the initial mal-functional bactericidicity during the early stages of neutrophil activation recovered pronouncedly.

#### Topic: Periodontal systemic interactions

### P0087

#### Relationship between periodontal disease and post-menopausal osteoporosis, A case-control study

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**Aim:** Postmenopausal osteoporosis may be a possible risk factor for periodontal disease. 1) Assess the periodontal status of a population of postmenopausal women. 2) Assess the validity of periodontal clinical diagnosis as a technique for early diagnosis of osteoporosis in postmenopausal women. 3) Assess the degree of relationship between changes in the Klemetti's mandibular cortical index (K-MCI), and periodontal clinical examination.

**Material and Methods:** Case-control study. Menopausal Group (MG):



postmenopausal women with spontaneous vertebral compression (maximum degree) (n = 77). Controls (CG): postmenopausal women with no history of osteoporosis (n = 77). Periodontal examination and a panoramic radiograph to determine the K-MCI was developed. Sample attended to the Virgen del Rocio Hospital (Seville, Spain) and the homogeneity of the same was confirmed by pelvic examination. Statistical method: Chi square test, Pearson test and ANOVA test (post-hoc Bonferroni). Significance p

**Results:** With the exception of number of teeth (19 MG, 23 CG; p 7, p

**Conclusion:** No relationship between MG and CG was found related to clinical examination. The degree of osteoporosis can be detected analyzing their panoramic radiograph, using the K-MCI.

Topic: Periodontal systemic interactions

**P0088**

### Periodontal Findings in Haim-Munk Syndrome. Review of the Literature and Report of Two Cases

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**Aim:** Haim-Munk syndrome (HMS) is an extremely rare autosomal recessive disorder similar to Papillon-Lefevre syndrome (PLS). Features that are alike in both PLS and HMS include palmoplantar keratosis and progressive early onset periodontal destruction. There are a number of additional features reported in HMS that include arachnodactyly, acroosteolysis, onychogryphosis, Pes planus, and psoriasiform lesions. Review of the literature with report of two cases will be presented.

**Material and Methods:** Two cases are presented of generalized advanced periodontal destruction of the permanent and deciduous dentitions in two Jordanian girls with severe HMS who were initially diagnosed as having PLS. The medical diagnosis was made on the basis of the characteristic clinical and radiographic finding.

**Results:** Periodontal findings include early onset of periodontitis which affected both the primary and permanent dentitions; intense redness and inflammation of the gingiva with rapid periodontal destruction resistant to periodontal therapy.

**Conclusion:** This report emphasizes the importance of the differential diagnosis of rare genetic disorders in children and adolescence. Additional HMS findings require a multidisciplinary approach involving the dermatologist, rheumatologist and periodontist for the overall care of the patient with HMS. Additional knowledge regarding this rare syndrome with respect to the response to periodontal treatment is lacking.

Topic: Periodontal systemic interactions

**P0089**

### Local inflammatory response of PMN in diabetic patients with periodontitis

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**Aim:** Diabetes mellitus type 2 (DM2) is a worldwide high prevalence disease and recent studies show a bidirectional linkage between DM and periodontitis. Polymorphonuclear neutrophils (PMN) are the primary cells of the innate immune system and the predominant type of leukocytes in gingival crevicular fluid (GCF). The objectives of the study were to develop an in vivo assay for testing individual inflammatory PMN-response and to investigate the kinetics of PMN migration into the gingival crevice of patients with DM2 and chronic periodontitis (DM2+CP) after application of a standardized chemotactic stimulus.

**Material and Methods:** After IRB approval, 16 individuals participated in this prospective study. Participants received a full periodontal examination and an oral hygiene phase. GCF was sampled minimal invasively (cf. Meyle, 1986) from DM2+CP and healthy controls (C). The anterior teeth of the upper jaw were isolated and gently air-dried. After baseline-washing, either a chemoattractant (2µl casein [2mg/ml]) or a placebo (contralateral tooth), was pipetted into the crevice (PD ≤ 3mm). GCF-sampling continued at 15, 25, 35 and 45 minutes. PMN-counts were calculated employing flow cytometry.

**Results:** In both groups the number of PMN that migrated into the casein containing crevice was significantly higher compared to the placebo containing crevice (at 15 minutes p<0.01 in DM2+CP and p<0.05 in C; t-test). Furthermore, 15 min after casein application PMN-counts in DM2+CP increased up to 3.7-times compared to C (p<0.01; t-test).

**Conclusion:** These data suggest an enhanced inflammatory reaction even in healthy sites in patients with DM2+PA compared to C.

Topic: Periodontal systemic interactions

**P0090**

### Body Mass Index as a predictor of preterm birth in pregnant periodontitis women

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**Aim:** The aim of this investigation is to assess the predictability of Body Mass Index (BMI) for preterm birth and low birth weight in women with established periodontal disease.

**Material and Methods:** Two-hundred parturients were periodontally examined after they gave birth in OB/GYN Department of University Clinical Center of Kosovo. Their BMI was calculated according to the collected data of weight (kg) and height (cm) on their first prenatal visit. Periodontal status was evaluated using probing depth (PD), clinical attachment level (CAL) and bleeding on probing (BoP). Women with established periodontitis were selected if they had two or more sites with PD 4 mm or more, one or more sites with CAL 3 mm or more, and BoP higher than 10%. Obstetrical data were obtained from the delivery records, whereas preterm birth was defined as birth before 37th week of gestation, and low birth weight was defined as birth-weight less than 2500 grams.

**Results:** Analyzed data were adjusted for BMI and obstetrical outcomes were compared between periodontitis and healthy subjects. It was found that there is significant statistical difference of gestational age (P=0.0046) between periodontitis subjects with normal BMI compared with overweight BMI. Other comparisons of BMI categories for gestational didn't show any statistical difference. There was no significant difference of birth-weight of periodontitis subjects between BMI categories.

**Conclusion:** It may be suggested that periodontal health and proper BMI of women who plan to get pregnant may be important to avoid the adverse outcomes of delivery.

Topic: Periodontal systemic interactions

**P0091**

### Non- surgical periodontal treatment of patients with periodontitis decreases high- sensitivity C - reactive protein levels

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**Aim:** Periodontal disease as a chronic infection has been associated with many chronic inflammatory systemic diseases. Recent studies have suggested that periodontitis may induce elevated serum C - reactive protein levels. The aim of this study was to compare high- sensitivity C - reactive protein levels (hs-CRP) in control individuals and patients with periodontal disease and observed whether non- surgical periodontal therapy affected hs- CRP levels after 3 months.

**Material and Methods:** Serum of 35 healthy controls and 75 patients with periodontal disease admitted in the Department of Periodontology and Oral Medicine, University Clinical Dental Center, Prishtina, Kosovo, were obtained prior to and 3 months after non- surgical periodontal therapy. Periodontal parameters included gingival index Loe- Sillness(0-3), dental plaque index Sillness- Lou(0-3), probing depth (mm), clinical attachment level (mm), bleeding index and tooth mobility index. Serum hs- CRP levels were assessed using Enzyme linked immunoassay. The significance between groups was determined using T-test,  $\chi^2$  test and Mann- Whitney test.

**Results:** Concentrations of hs- CRP were lower in the control group at baseline compared to the periodontal disease group ( $0.5 \pm 0.6$  vs.  $2.5 \pm 2.6$ ). Non -surgical periodontal therapy decrease hs- CRP concentrations observed 3 months after therapy with statistical significance ( $p < 0.05$ ).

**Conclusion:** Periodontal disease is associated with increased circulating concentraions of hs- CRP which decreased after non- surgical periodontal therapy.

Topic: Periodontal systemic interactions

**P0092**

### Effect of Nonsurgical Periodontal Therapy on Serum and Gingival Crevicular Fluid Cytokine Levels During Pregnancy and Pospartum

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**Aim:** Background: A low-grade systemic inflammatory status originated from periodontal infection has been proposed to explain the association between periodontal disease and systemic

conditions including adverse obstetric outcomes. The aim of this study was to evaluate the effect of periodontal therapy during pregnancy on gingival crevicular fluid (GCF) and serum levels of six cytokines associated with periodontal disease and preterm birth

**Material and Methods:** A subsample of 58 women (18-35 years-old) up to 20 gestational weeks previously enrolled in a larger randomized clinical trial was used. Participants were randomly allocated to receive comprehensive nonsurgical periodontal therapy before 24 gestational weeks (n=28, test group) or only one appointment of supragingival calculus removal (n=30, control group). Clinical data, blood and GCF samples were collected at baseline, 26-28 gestational weeks and 30 days after delivery. IL-1b, IL-6, IL-8, IL-10, IL-12p70 and TNF- $\alpha$  levels were analyzed by flow cytometry.

**Results:** After treatment, a major reduction in periodontal inflammation was observed in the test group with bleeding on probing decreasing from 49.62% to 11.66% of sites ( $p < 0.001$ ). Periodontal therapy significantly reduced GCF levels of IL-1b and IL-8 ( $p < 0.001$ ). However, no significant effect of periodontal treatment was observed on serum cytokine levels. After delivery, GCF levels of IL-1b in test group were significantly lower than in control group ( $p < 0.001$ ), but there were no significant differences between test and control groups regarding serum cytokine levels

**Conclusion:** Although periodontal therapy during pregnancy successfully reduced periodontal inflammation and GFC cytokine levels, it did not have a significant impact on serum biomarkers.

Topic: Periodontal systemic interactions

**P0093**

### Gingival Hyperplasia Associated with Juvenile Hyaline Fibromatosis: A case report

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**Aim:** Juvenile Hyaline Fibromatosis (JHF) is a rare autosomal dominant systemic disease; characterized by multiple cutaneous hyaline fibromas, papules on the skin, joint contractures and gingival fibromatosis. Less than 80 cases of JHF have been reported, mostly in children. In this text, we describe the clinical manifestations and management of a patient with JHF who presented gingival overgrowth.

**Material and Methods:** 11-year-old female patient was referred to Gulhane Military Hospital, Department of Periodontology. Skin nodules were palpable on her back, nape and forehead region was seen. Apart from these lesions, a fibroxanthoma was observed on her tibia with its typical appearance on X-ray, CT and MR images. Generalized fibrotic and diffuse gingival enlargement observed in intra-oral examination. Surgical excision of subcutaneous nodules and a full-mouth gingivectomy was made under general anesthesia. These procedures led to a significant improvement of her orofacial appearance, esthetic status and function in her ability to eat and speak. Histopathologic examination of the excised lesions showed hypocellular regions, with abundant, homogenous hyaline deposits. Based on the clinical and histopathological findings, a diagnosis of JHF was made. Maintenance therapy, including oral hygiene instructions and scaling was performed every 3 months to support oral hygiene

**Results:** No therapy has yet been discovered that can cure or prevent the progression of JHF. But symptomatic treatment of oral lesions may include gingivectomy and repeated as appropriate.

**Conclusion:** Gingivectomy is a useful method and maintenance of good oral hygiene is an important factor for decreasing the growth rate of the gingiva in the patients with JHF.

Topic: Periodontal systemic interactions

## P0094

### Maternal periodontal status and preterm delivery: a hospital based case-control study

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**Aim:** Recent studies have presented evidence that periodontal disease in pregnant women may be a determining factor for preterm

delivery. However, this finding has not been consistently observed. The present investigation was carried out to explore the association between maternal periodontal disease and preterm delivery in the state of Kerala, India

**Material and Methods:** The case-control study had a sample of 300 (100 cases and 200 controls) postpartum women over 18 years of age. Cases were women who had undergone spontaneous preterm delivery (< 37 wk of gestation) and controls were women who delivered at term (≥ 37 wk of gestation). Standard, clinical and periodontal examinations were performed at the maternity wards, and the existence of an association between periodontal disease and preterm delivery was evaluated by means of a multivariate logistic regression model that also considered other risk factors for preterm delivery.

**Results:** Periodontitis was diagnosed in 25% of the mothers in the case group and

in 14.5% of the mothers in the control group. Logistic regression analysis indicated a risk of nearly threefold for preterm delivery in mothers with periodontitis [adjusted odds ratio (ORa) = 2.72; 95% confidence interval (CI): 1.68–6.84]. The other factors significantly associated with preterm birth were physical exertion (ORa = 2.80; 95% CI: 1.18–6.65), a previous history of preterm birth (ORa = 2.65; 95% CI: 1.20–5.83) and previous abortion/death of infant (ORa = 4.08; 95% CI: 1.56–10.65).

**Conclusion:** Periodontal disease is a possible risk factor for preterm delivery in this population.

Topic: Periodontal systemic interactions

## P0095

### Interactions of Adiponectin and Lipopolysaccharide from *Porphyromonas gingivalis* on Gingival Epithelial Cells

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**Aim:** Periodontitis is a chronic inflammatory disease caused by pathogenic microorganisms, such as *Porphyromonas gingivalis*, and characterized by the destruction of periodontal tissues. Obese individuals have an increased risk for periodontitis and show decreased serum levels of adiponectin. This in-vitro study was performed to examine whether adiponectin modulates critical effects of lipopolysaccharide (LPS) from *P. gingivalis* on gingival epithelial cells (GECs).

**Material and Methods:** The presence of adiponectin and its receptors in human gingival tissue samples and GECs was analyzed by immunohistochemistry and PCR. Furthermore, GECs were incubated with LPS and/or adiponectin for up to 72 h, and the gene expression and protein synthesis of pro- and anti-inflammatory mediators, matrix metalloproteinases (MMPs) and growth factors were assessed by real-time PCR and ELISA. Moreover, cell proliferation, differentiation and in-vitro wound healing were analyzed. The nuclear translocation of NFκB was studied by immunofluorescence.

**Results:** Gingival tissue sections showed a strong production of adiponectin and its receptors in the epithelial layer. In cell cultures, LPS induced a significant up-regulation of interleukin (IL) 1β, IL6, IL8, MMP1 and MMP3. Adiponectin inhibited significantly the stimulatory effects of LPS on these molecules. Similarly, adiponectin abrogated significantly the LPS-induced decrease in cell viability and increase in cell proliferation and differentiation. Adiponectin caused a time-dependent induction of the anti-inflammatory mediators IL10 and heme oxygenase 1, and blocked the LPS-stimulated NFκB nuclear translocation.

**Conclusion:** Adiponectin may counteract critical actions of *P. gingivalis* on gingival epithelial cells. Low levels of adiponectin, as observed in obese individuals, may increase the risk for periodontitis.

Topic: Periodontal systemic interactions

## P0096

### Periodontitis by type 1 plasminogen deficiency – a rarely known disease

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**Aim:** Type 1 plasminogen deficiency is a rare condition that has been causally linked with an uncommon and severe form of a chronic inflammatory disease of the mucous membranes. The severity of the disease is related to the degree of plasminogen deficiency. This report investigates the subgingival microbial flora, elastolytic activity (EA) in gingival crevicular fluid (GCF) and immunostaining pattern of pathogenesis-related factors in gingival biopsies in a group of 5 patients.

**Material and Methods:** GCF was collected with Periopaper® strips and quantified in a Periotron®. EA was measured using a fluorometric assay. Subgingival plaque samples were evaluated for periodontopathogenic bacteria. The occurrence of elastase to detect PMNLs and plasminogen, fibrinogen and cathepsin G has been investigated by immunohistochemistry on sections of paraffin embedded gingival specimens.

**Results:** GCF volume as well as EA were significantly high, but the composition of subgingival flora was similar to periodontal diseases. Immunohistochemical staining for elastase revealed high

numbers of PMNLs unequally distributed in the tissue, whereas staining for plasminogen, fibrinogen and cathepsin G was weak.

**Conclusion:** In the present study, we assume that the high numbers of PMNLs in the tissues, the high EA in GCF and the weak immunohistochemical staining for plasminogen may be a sign of an alternative mechanism of fibrin clearance, which fails because of plasminogen deficiency. In spite of the similar composition of subgingival flora to periodontal diseases, the established treatment methods are here so far ineffective. The question remains if the oral lesions form an independent disease pattern in the current classifications of periodontal diseases.

## Topic: Periodontal systemic interactions

### P0097

#### **Influence of periodontal disease, *Porphyromonas gingivalis* and cigarette smoking on systemic anti-citrullinated protein antibody titres**

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**Aim:** To determine whether periodontitis, carriage of *Porphyromonas gingivalis*, smoking and periodontal therapy influence anti-CCP antibody titres since *P. gingivalis* Peptidylarginine deiminase citrullinate human proteins possibly inducing autoimmunity in susceptible individuals. Anti-citrullinated protein (anti-CCP) antibody responses may precede clinical onset of rheumatoid arthritis.

**Material and Methods:** Serum and plaque samples were collected from 39 periodontitis patients (15 smokers) with no other known medical condition before and after non-surgical periodontal treatment and from 36 healthy subjects (16 smokers) of similar age and gender. Carriage of *P. gingivalis* was determined by PCR of plaque bacterial DNA. Antibody titres were determined by ELISA. The data were analysed with distribution free statistical tests.

**Results:** Anti-CCP exceeded detection threshold in 95% samples tested but only patients that were PCR-positive for *P. gingivalis* had anti-CCP titres greater than the diagnostic cut-off (500 units/ml). There was a negative correlation between anti-CCP and anti-*P. gingivalis* IgG titres. Periodontal-treatment reduced anti-CCP and anti-*P. gingivalis* titres. Post-treatment only one patient remained PCR positive for *P. gingivalis* and continued to have anti-CCP titres greater than cut-off. Untreated periodontitis patients had higher titres of anti-CCP than healthy controls ( $p < 0.0001$ ). While, smoking lowers anti-*P. gingivalis* titres, it does not alter anti-CCP titres in periodontitis patients and increases anti-CCP titres of healthy subjects.

**Conclusion:** Within sample size limitations this data suggests that higher anti-CCP titres are found in periodontitis patients or smokers. Treatment of periodontitis and removal of subgingival plaque and *P. gingivalis* in particular reduces anti-CCP titres as well as anti-*P. gingivalis* titres.

## Topic: Clinical Research: Periodontal systemic interactions

### P0099

#### **Association between periodontal pathogens and coronary artery disease:**

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**Aim:** The present study evaluated the correlation between periodontal pathogens and atherosclerosis

**Material and Methods:** This case-control study was done on 40 individuals underwent surgery of coronary vessels infected with chronic periodontitis (case group) or without periodontitis patients (control group) matched regarding age and sex. The subgingival plaque was collected by a sterile curette from periodontal pockets  $\geq 5$ mm and CAL  $\geq 4$ mm. Also, atherosclerotic plaque was collected during the coronary endarterectomy surgery from the all of 40 patients. The specimens were subjected to PCR technique and the incidence of specific bacteria responsible for chronic periodontitis including Aa, Pi, Pg, Tf, Td, Fn were assessed.

**Results:** In the atherosclerotic plaque of control individuals, Aa, Pg and Td were found in 2 individuals (10%), Tf in 3 (15%) and Pi and Fn being identified in 4 specimens (20%). In atherosclerotic plaque of cases, Aa was identified in 18 specimens (90%), Pg in 16 (80%), Tf in 13 (65%), Td in 11 (55%), Pi in 10 (50%) and Fn being present in 6 specimens (30%) showing significant differences in Aa ( $p < 0.0001$ ), Pg ( $p < 0.0001$ ), Pi ( $p < 0.05$ ), Tf ( $p < 0.001$ ) and Td ( $p < 0.002$ ) between cases and controls.

**Conclusion:** The findings support the potential role of the periodontopathogenic bacteria species in some steps of the atherosclerotic process as a contributor that worsens this disease.

## Topic: Clinical Research: Periodontal systemic interactions

### P0101

#### **Prevalence of periodontal pathogens DNA in periodontal pockets and atherosclerotic plaques observed in patients suffering from cardiovascular diseases and periodontitis.**

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**Aim:** The aim of research was to evidence the co-existence of *Porphyromonas gingivalis* DNA in periodontal pockets and in atheromatous plaques of coronary and/or carotid arteries of patients with chronic periodontitis, hospitalized and operated because of vessels diseases.

**Material and Methods:** The presence of *Porphyromonas gingivalis* DNA in atheromatous plaques and in samples taken from periodontal pockets was determined by real-time PCR. 31 samples of atheromatous plaques were taken from patients during carotid endarterectomy and 32 samples were taken from patients during CABG operations - sterile paper points were inserted into atherosclerotic plaque of open coronary vessels for 10 seconds. Subgingival samples were collected from the deepest periodontal pockets.

**Results:** Bacterial DNA was found in 47 of 63 (74,6%) samples



taken from periodontal pockets and in 18 of 63 (28,5%) samples of atheromatous plaques. Positive samples in most cases came from patients after endarterectomy. There was no correlation between the presence of bacterial DNA in periodontal pockets and in atheromatous plaques.

**Conclusion:** Periodontal pathogens are present in atherosclerotic plaques. These results might indicate a link between periodonto-pathogens entering the cardiovascular system and cardiovascular diseases.

Topic: Clinical Research: Periodontal systemic interactions

P0102

### GroEL Reactive T Cells In Atherosclerosis and Chronic Periodontitis

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**Aim:** The aim of the present study was to determine the profile of cytokine gene expression of P. gingivalis GroEL reactive T cells in the peripheral blood of patients with atherosclerosis and those with chronic periodontitis, in order to gain some insight into the functional activity of these cells in atherosclerosis and chronic periodontitis

**Material and Methods:** Peripheral blood was obtained from A (n=5), P (n=5), healthy (H) (n=2) and atherosclerosis with chronic periodontitis (AP) (n=1) patients. Mononuclear cells (MNCs) were isolated using density gradient centrifugation. The MNCs were cultured in media alone and with recombinant P. gingivalis GroEL to determine the lymphoproliferative activity in each group. RNA extraction was performed and followed by real time PCR to determine the cytokine gene expression profiles of A and P patients. The results were analysed using the 2-<sup>-T</sup>CT method.

**Results:** Differential cytokine gene expression profiles were observed in A and P groups. Thirty-nine (46%) of 84 genes, were differentially expressed in the A group and fifty-five (65%) of 84 genes were differentially expressed in the P group. Of the thirty-nine genes that were differentially expressed in the A group, nineteen (49%) were upregulated and twenty (51%) were downregulated. In the P group, of the fifty-five genes that were differentially expressed, twenty-eight (51%) genes were upregulated, and twenty-seven (49%) genes were downregulated.

**Conclusion:** The results suggest that GroEL specific T cells may respond differently in atherosclerosis and chronic periodontitis. The reason for this difference is unknown but may relate to the recognition of different epitopes in each group.

Topic: Clinical Research: Periodontal systemic interactions

P0103

### Evaluation of Periodontal Status in Menopause Women with Osteopenia, Osteoporosis as Compared with the Healthy Group

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**Aim:** Different studies have reported contradictory results about the effect of osteoporosis on periodontal status. we performed this study to evaluate periodontal status of menopausal women by methods with enough accuracy and confidence.

**Material and Methods:** This study was performed based on evaluation of density of tight and back bones with method of (Dual energy X-ray absorptiometry) during 2010. A total of 60 patients referring to density evaluation of Emam Reza hospital who met including criteria were selected and divided into three groups of osteoporosis, osteopenia, and normal. Then, evaluation of periodontal markers such as pocket depth (DP), attachment loss (AL), and tooth loss (TL) was performed by a dental student. The patients doubtful to periodontal disease and bone decline were referred for panoramic radiography. Finally, evaluated periodontal markers were compared in three groups.

**Results:** Mean bone decline was more in osteoporosis group rather than two other groups, but the difference was not significant (P=0.065). Also, mean of plaque index (P=0.123), pocket depth (P=0.856), attachment loss (p=0.525), and tooth loss (p=0.884), number of people with attachment loss more than or equal to two millimeter (P=0.866) and number of people with bone loss more than or equal to two millimeter (P=0.348) were not significantly different between three groups of osteoporotic, osteopenic and normal Individuals.

**Conclusion:** In this study, no significant difference was observed between three groups in terms of plaque index, pocket depth, attachment loss, and tooth loss. However, more studies controlling all possible confounding variables and performing linear studies are necessary.

Topic: Clinical Research: Periodontal systemic interactions

P0105

### Computed tomography aspects in patients with ischemic cerebrovascular accidents and periodontal disease

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**Aim:** This study aims to evaluate the association between computed tomography aspects of periodontitis and ischemic cerebrovascular accidents and to identify the risk group for this association.

**Material and Methods:** We recruited 48 patients aged 17-52 years who were diagnosed via computed tomography brain imaging as having an ischemic cerebrovascular accident by specialist. The association between periodontitis and ischemic cerebrovascular accident was evaluated using multivariate logistic regression analyses with adjustment for age, gender, income, education, hypertension, diabetes, etc.

**Results:** From the 853 teeth we analyzed on the CT sections 4-5mm bone loss, >6mm bone loss, interrader lesions, irredeemable teeth. After 6mm bone loss from the ECJ and interrader lesions was found to be significantly associated with ischemic cerebrovascular accidents. The proximal bone loss evaluated on the CT is higher in the lateral areas compared to anterior areas.

**Conclusion:** The present study confirms the existence of correlations between severe periodontal disease and ischemic cerebrovascular accidents - A. R. Pradeep (2010) and Pekka Ylöstalo (2010) and justified by the influence of permanent discharge of proinflammatory factors (cytokines: IL-1  $\beta$ , TNF- $\alpha$ , etc.) from the oral cavity into the bloodstream, contributing with other factors (cholesterol, triglycerides) to the appearance and evolution of ischemic cerebrovascular accidents. Periodontal examination and periodontal infections treatment should be part of the overall treatment of patients with ischemic cerebrovascular accidents.

Topic: Clinical Research: Periodontal systemic interactions

## P0106

### The effect of non-surgical periodontal treatment on C-Reactive Protein (CRP) levels in patients with chronic periodontitis: a controlled clinical trial

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**Aim:** The aim of the present study was to evaluate serum C-reactive protein (CRP) levels in chronic periodontitis patients and periodontally healthy individuals and to assess the effect of non-surgical periodontal treatment on the CRP levels.

**Material and Methods:** Twenty two patients with chronic periodontitis (Test Group) and 22 periodontally healthy individuals without any systemic disorder (Control Group) were included in the study. At baseline, periodontal clinical variables and CRP levels were obtained in both groups. In the Test Group, oral hygiene instruction and scaling and root planning were carried out and after 60 days periodontal clinical variables and CRP levels were re-evaluated.

**Results:** The baseline CRP level in the Test Group was significantly higher than the corresponding values in the Control Group ( $1.97 \pm 1.55$  mg/L vs.  $1.26 \pm 1.05$  mg/L;  $p < 0.05$ ). After periodontal treatment in the Test Group, there were improvements in all periodontal clinical variables ( $p < 0.05$ ). In addition, the CRP level decreased significantly only in those patients with higher baseline levels of CRP ( $> 3$  mg/L).

**Conclusion:** Chronic periodontitis seemed to promote elevated levels of CRP. Furthermore, non-surgical periodontal treatment significantly decreased the levels of CRP in patients with high baseline levels of such pro-inflammatory cytokine.

Topic: Clinical Research: Periodontal systemic interactions

## P0107

### Correlation between periodontal disease with changes of FBS, CRP, Blood factors and Lipid profile

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**Aim:** Many people in the world are affected by hyperlipidemia, which is a known risk factor for atherosclerosis. On the other hand, periodontitis, a prevalent oral disease, has been related

to disorders, like an altered lipid-metabolism. Transient and recurrent bacteremias, caused by periodontal infection may produce local and systemic inflammatory responses in the whole body. The aim of the present study was to verify the relationship between periodontal disease and blood lipid, FBS, blood factors & CRP levels.

**Material and Methods:** Two hundred individuals who had been referred to Mashhad University of Medicine Sciences were divided into age and sex matched two groups with and without periodontitis. Blood sample was taken from each participant. Total cholesterol, LDL, HDL, Triglyceride, FBS, Blood factors and CRP levels were calculated and compared between the groups.

**Results:** The results showed that LDL (124.6 mg/dl), CRP (6.9 mg/dl), FBS (100.8mg/dl), WBC ( $6.1 \times 10^3$ ) and RBC ( $9.9 \times 10^6$ ) levels were higher in periodontitis patients than those without periodontitis (LDL = 120.7mg/dl, CRP = 6.03mg/dl, FBS = 93.7 mg/dl, WBC =  $5.9 \times 10^3$  and RBC =  $4.9 \times 10^6$ ) but the differences were not significant. Also we noticed that the number of individuals with pathologic levels of FBS ( $> 100$ mg/dl=27), TG ( $> 200$ mg/dl=17), LDL ( $> 60$ mg/dl=13) and HDL ( $> 45$ mg/dl=71) in periodontitis group were more than healthy group, but the differences were not significant.

**Conclusion:** This study demonstrated that there was no significant relationship between periodontal disease, regardless of its intensity, and blood lipid level, FBS, CRP and Blood cells. More studies with larger sample size are recommended.

Topic: Clinical Research: Periodontal systemic interactions

## P0108

### Assessment of IL-6 and CRP levels in patients with periodontitis and transitory ischemic accidents

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**Aim:** The aim of this study was to evaluate the level of serum proinflammatory cytokines such as: IL-6, C-reactive protein (CRP) in patients with severe periodontitis and transitory ischemic accidents compared to a group of patients with transitory ischemic accidents without periodontal disease.

**Material and Methods:** We included in study 41 patients (17-48 years old), grouped in: a lot of patients with transitory ischemic accidents and periodontal disease (21 patients) and a lot of a patients with ischemic accidents without severe periodontitis (20 patients). Clinical and radiological examination of periodontal status was performed to all patients and blood samples were collected for the determination of the proinflammatory cytokines.

**Results:** We observed a statistically significant increase of IL-6 and CRP in patients with severe periodontal disease and transitory ischemic accidents compared to the group of patients without periodontitis, but who have suffered ischemic accidents. Also, serum levels of CRP and IL-6 were not significantly higher among young subjects without severe periodontitis.

**Conclusion:** The significant increase of IL-6 and CRP in patients with severe periodontitis and transitory ischemic accidents confirm the correlation between severe periodontitis and transitory ischemic accidents.

Topic: Clinical Research: Periodontal systemic interactions

## P0109

### Effects of periodontal therapy on the condition of rheumatoid arthritis

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**Aim:** Recent studies suggested an association between infection with periodontopathic bacteria and rheumatoid arthritis (RA). The aim of this study was thus to evaluate the effects of periodontal therapy on the clinical condition and serum biochemical parameters of RA.

**Material and Methods:** Fifty-five participants with RA and periodontitis were assigned to receive non-surgical periodontal therapy including oral hygiene instruction and scaling (test group: n = 26) or no periodontal therapy (control group: n = 29). The following parameters were examined at baseline and 6 weeks later: gingival index (GI), probing pocket depth (PPD), clinical attachment level (CAL), bleeding on probing (BOP) and plaque control record (PCR), RA disease activity score including 28 joints (DAS28), serum levels of interleukin-6 (IL-6), TNF- $\alpha$ , matrix metalloproteinase-3 (MMP-3), C-reactive protein, anti-cyclic citrullinated peptide antibodies, rheumatoid factor (RF), and immunoglobulin G (IgG) antibodies to Porphyromonas gingivalis.

**Results:** Significant improvements of GI, PPD, CAL, PCR, and BOP were observed in the test group ( $P < 0.001$ , for all), which were significantly different from the control group ( $P < 0.001$ , for all). Serum levels of IgG to P. gingivalis were significantly decreased in the test group ( $P = 0.02$ ), whereas those of anti-P. gingivalis responses, IL-6 and MMP-3 were increased in the control group ( $P = 0.04$ ,  $P = 0.02$ , and  $P = 0.04$ ). Furthermore, a significant association was obtained between anti-P. gingivalis responses and RF levels ( $P = 0.04$ ). No difference was observed in other parameters between the time points, and between the groups.

**Conclusion:** These results suggest that periodontal therapy may lead to decreased anti-P. gingivalis responses, which is associated with serum levels of RF.

Topic: Clinical Research: Periodontal systemic interactions

## P0110

### Pilot study performed in Hematology Departement of Policlinico S. Matteo of Pavia to develop guidelines for proper use of mucoadhesive solutions in chemotherapy patients

L.A. Marino, F. Olivares, E.M. Manazza

Pavia/Italy

**Aim:** Chemotherapy side effects most often affect oro-pharyngeal apparatus. The aim of this work is produce new guidelines to use properly mucoadhesive solution, sodium chloride and Chlorhexidine in patients before and during chemotherapy.

**Material and Methods:** 35 people involved divided into 3 groups: - 10 sodium chloride rinse, - 10 chlorhexidine gluconate

0,12% rinse - 15 mounthwashes with mucoadhesive solution. All patients have sought treatment for 14 days, performing mouthwash 3-4 times a day in the morning, at 12.00 pm and in the evening. To evaluate the grade of mucositis we used the OMS classification. The following table shows times of dispense of single agent.

	Before Chemotherapy (BC)	During/After Chemotherapy (DAC)
Mucoadhesive	7	8
Sodium Chloride	4	6
Chlorhexidine	6	4

**Results:** Using Mucoadhesive before and during or after therapy, patients shown reduction of Grade 4 mucositis expecially in DAC group (80% reduction). In BC group mucositis stays on grade 0 or 1 (100%).

Patients treated with sodium chloride BC and DAC didn't shown differences in mucositis grade. Also patients who used chlorhexidine before, during/after chemotherapy haven't had improvement in oral health.

**Conclusion:** From our study we can conclude that mucoadhesive solution is highly validating in mucositis of grade 4 and lower grade. It should be used in early stages of chemotherapy especially in prevention. Clorhexidine and Sodium Chloride rinses didn't shown a relevant improvement of oral conditions independently used before during and after chemotherapy for every kind of mucosities.

Topic: Clinical Research: Periodontal systemic interactions

## P0111

### Interdental papilla regeneration in a 24 year old woman with necrotizing periodontal disease: a case report.

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Alcorcón/Spain

**Aim:** Necrotizing periodontal disease its one of the periodontal pathology how it is seeing to be more common in young smoker students under stress.

**Material and Methods:** We are presenting a young woman in her last year of university, under stress with acute necrotizing ulcerative gingivitis. We teach her how to brush her teeth, use clorhexidine twice a day and we give antibiotics. After a week we proceed to treat her and during the scaling and root planing we tried to create blood clots in the areas of interdental papilla in order to regenerate them. We follow her during one year and see how the papillas were regenerated by themselves without any surgical therapy.

**Results:** As we see, basic therapy it is enough to treat the defects produced from the necrotizing periodontal disease if we explain our patients the benefits of follow a good cleaning protocol and maintenance therapy recall.

**Conclusion:** The maintenance therapy it is the gold of the necrotizing periodontal diseases and it is possible to regenerate the defects without plastic surgical.

## Topic: Clinical Research: Periodontal systemic interactions

## P0112

**Relationship between markers of glycemic control and severity of periodontal disease in type 2 diabetic patients.- Initial report**A. Raducu<sup>1</sup>, A. Virtej<sup>2</sup>, H.T. Dumitriu<sup>1</sup>, A.S. Dumitriu<sup>1</sup><sup>1</sup>Bucharest/Romania, <sup>2</sup>Bergen/Norway

**Aim:** The aim of the present study was to assess the relationship between different periodontal disease parameters and markers of metabolic control in type 2 diabetes mellitus (DM) patients.

**Material and Methods:** Thirty-six patients with type 2 DM were invited to participate in the study. Periodontal status was recorded by the same dental practitioner performing full-mouth clinical examination for probing pocket depth (PPD in mm), attachment loss (AL in mm) and bleeding on probing (BOP yes/no). Systemic evaluation was recorded using venous blood samples analysed for glycated haemoglobin (HbA1c), and lipid profile comprising total cholesterol; HDL-cholesterol; LDL-cholesterol; triglyceride.

**Results:** Positive correlations were found between HbA1c and percentage sites with probing depths  $\geq 5$ mm, sites with increased attachment loss and sites BOP, as well as with total cholesterol, LDL cholesterol and triglycerides. Patients with acceptable glycaemic control (HbA1c  $\leq 8$ ) showed a lower percentage of sites with probing depths  $\geq 5$ mm, AL and BOP and when compared to those having poor glycaemic control (HbA1c  $> 8$ ). Periodontal disease severity in terms of increased percentage of AL, BOP and probing depths  $\geq 5$ mm was found to be associated with inadequate glycaemic control as evaluated by HbA1c.

**Conclusion:** We detected that the value of HbA1c as the main indicator of metabolic control in type 2 diabetic patients is correlated in a direct manner with the severity and the extent of periodontal disease. Further larger sample studies are needed in order to verify the results gathered in this initial study

## Topic: Clinical Research: Periodontal systemic interactions

## P0113

**Is there an Interaction between Polycystic Ovary Syndrome and Gingival Inflammation?**O. Ozcaka<sup>1</sup>, B. Öztürk Ceyhan<sup>1</sup>, A. Akcalı<sup>1</sup>, N. Biçakçı<sup>1</sup>, D.F. Lappin<sup>2</sup>, N. Buduneli<sup>1</sup><sup>1</sup>Izmir/Turkey, <sup>2</sup>Glasgow/United Kingdom

**Aim:** The aim of this study was to evaluate the gingival crevicular fluid (GCF), saliva and serum concentrations of tumour necrosis factor-alpha (TNF- $\alpha$ ), TNF- $\alpha$  receptor-1, TNF- $\alpha$  receptor-2 and interleukin-6 (IL-6) in non-obese women with polycystic ovary syndrome (PCOS) and either clinically healthy periodontium or gingivitis.

**Material and Methods:** Thirty-one women with PCOS and healthy periodontium, 30 women with PCOS and gingivitis and 12 systemically and periodontally healthy women were included in the study. GCF, saliva, and serum samples were collected and clinical periodontal measurements, body mass index (BMI) and Ferriman-Gallway score (FGS) were recorded. Sex hormones,

cortisol and insulin levels were measured. TNF- $\alpha$ , TNF- $\alpha$  receptor-1, TNF- $\alpha$  receptor-2 and IL-6 were determined by ELISA. Kruskal-Wallis followed by Bonferroni corrected post hoc Mann-Whitney U tests were used to analyse the data.

**Results:** PCOS+gingivitis group revealed significantly higher GCF, saliva, and serum IL-6 concentrations than PCOS+healthy group ( $p < 0.0001$ ). The two PCOS groups exhibited significantly higher saliva TNF- $\alpha$  concentrations than the control group ( $p = 0.014$  and  $p = 0.023$ , respectively). FGS index was significantly higher in PCOS+gingivitis group than PCOS+healthy group ( $p = 0.030$ ). PCOS+gingivitis group revealed significantly higher insulin concentration than PCOS+healthy and control groups ( $p = 0.014$  and  $p < 0.0001$ , respectively). Serum TNF- $\alpha$ , TNF- $\alpha$ Rs and serum, GCF and salivary IL-6 levels correlated with the clinical periodontal measurements.

**Conclusion:** PCOS and gingival inflammation appear to act synergistically on the pro-inflammatory cytokines; IL-6 and TNF- $\alpha$ . Thus, PCOS may have an impact on gingival inflammation or vice versa. Further studies are warranted to clarify the possible relationship between PCOS and periodontal disease.

## Topic: Clinical Research: Periodontal systemic interactions

## P0114

**The level of serum osteoprotegerin associates with periodontal attachment loss.**

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**Aim:** Receptor activator of nuclear factor kappa b ligand (RANKL) is known for its ability to promote osteoclast differentiation whereas OPG is a decoy receptor, binding to RANKL and suppressing its activity. In cardiovascular diseases (CVD) serum RANKL and OPG levels reflect inflammation associated with atherogenesis. The aim of our study was to explore the association between the extent of chronic periodontitis and circulating levels of sRANKL and OPG.

**Material and Methods:** Plaque, bleeding on probing, probing pocket depth (PD) and attachment level (AL) were examined in 80 T1DM subjects. The serum levels of sRANKL (pg/ml), osteoprotegerin (pg/ml) and glycosylated hemoglobin (HbA1c, %) were determined. Plaque, age, gender, smoking, HbA1c and body mass index (BMI) adjusted associations between periodontal parameters and serum OPG were studied using multiple regression models.

**Results:** A statistically significant association was found between the extent of sites with AL  $\geq 4$ mm and serum OPG levels ( $B = 0.011$ ,  $p = 0.021$ ). No associations were found between periodontal parameters and serum sRANKL level.

**Conclusion:** Apart from its role as an inhibitor of bone destruction, serum OPG level appears to be associated with periodontal attachment loss. Our observation suggests that serum OPG is a marker for the susceptibility to periodontal attachment loss in T1DM patients as it is for the pathways involved in the pathogenesis of CVD in general population.



Topic: Clinical Research: Periodontal systemic interactions

## P0115

### Serum cytokine levels in term and preterm deliveries relating to periodontal health

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Szeged/Hungary

**Aim:** The aim of the study was to evaluate cytokine levels in maternal serum and compare these with the periodontal status of mothers.

**Material and Methods:** Mothers were divided into two groups, Term (40 women, 30.8yrs) and Preterm (41 women, 30.4yrs), according to the newborn's weight and time of delivery. The Preterm group consisted of those mothers whose baby's weight was <2500g, or whose delivery took place before 37 completed weeks of pregnancy. Blood samples were collected immediately after delivery. Dental and periodontal examinations were carried out within three days after delivery. Serum IL-1 $\beta$ , IL-6 and TNF- $\alpha$  levels were determined by ELISA kits. For the statistical analysis Fisher's exact p and chi-squared test, Mann-Whitney test and Spearman correlations were used.

**Results:** The frequency of bleeding on probing and the average PD were greater in the Preterm group than in the Term group (45% vs. 27%, and 1.87mm vs. 1.76mm). There was a significant relationship between the frequency of BOP and the time of delivery. Serum IL-1 $\beta$  and TNF- $\alpha$  levels were higher when the birth weight was smaller, the delivery happened prematurely and PD  $\geq$ 4mm was more frequent, however serum IL-6 level was lower in these cases. Serum cytokine levels were higher in mothers with positive BOP at more teeth.

**Conclusion:** There was a significant relationship between the frequency of BOP and the length of pregnancy ( $p=0.000$ ), but no significant relationship was detected between periodontal status and serum cytokine levels.

Topic: Clinical Research: Periodontal systemic interactions

## P0116

### Alport syndrome: gingival overgrowth caused by immunosuppressive therapy after renal transplatation.

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Zagreb/Croatia

**Aim:** The aim of this paper was to show periodontal treatment of rare systemic condition such as Alport syndrome.

**Material and Methods:** A 35-year old male presented at Department of Periodontology complaining of tumor-like growth in last 6 months on gums above the upper left molar. Alport syndrome was diagnosed by genetic testing as Syndrome Epstein subtype with macrothrombocytopenia which was de novo mutation. The disease began as renal insufficiency at the age of 11 years. At the age of 26 he underwent a kidney transplantation (allotransplant, mother). Since then he is continuously taking immunosuppressive drugs.

Clinical examination showed generalised hyperplasia of the papillae and soft tissue overgrowth of attached gingiva in pedicle like shape

at the upper left second molar measuring 10x10 mm. Gingival overgrowth created pseudopockets. The mechanical therapy was performed and detailed instructions in oral hygiene were given. Chlorhexidine gluconate 0.2 % solution and azithromycin were prescribed.

**Results:** Reevaluation after six weeks showed hyperplasia of the papillae significantly reduced on the molars and premolars, but growth on attached gingiva retained the size. Surgical excision was performed, the tissue was removed and sent for histopathological diagnosis.

**Conclusion:** Gingival overgrowth in Alport syndrome caused by immunosuppressive drugs can be successfully treated using debridement and surgical removal, supported by meticulous plaque control.

Topic: Clinical Research: Periodontal systemic interactions

## P0117

### Periodontal Disease and sickle cell anemia: A Brazilian Reality

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**Aim:** The aim of this study is to describe the oral manifestations more frequently diagnosed in sickle cell anemia carries, emphasizing the periodontal alterations, which can lead to dental loss.

**Material and Methods:** The sickle cell disease is a genetic hematologic disorder caused by changes in the structure that leads to deformed red cells and vaso-occlusion crisis. In addition to, some complications affected: lungs, brain, spleen, skin, kidneys and liver. Sickle cell anemia may also cause oral manifestations like: atrophic glossitis, angular cheilitis, paresthesia of the mandibular nerve, as well as, periodontal alteration.

**Results:** Patients present a variety of systemic disorders compromising their life expectancy. Sickle cell anemia is the most prevalent in Brazil, particularly among African Brazilian descendants. In the city of Salvador-State of Bahia-Brazil, where most of its population has an African background, it has been registered a high prevalence of this disease with the proportion of 1:650 carries, despite the fact that it can also be detected by hematocrit count lower than 30%.

**Conclusion:** In Brazil, sickle cell anemia, has an important epidemic significance due to its elevated prevalence and death rates, the reasons why the blood disorder has been pointed out like a public health problem.

Topic: Clinical Research: Periodontal systemic interactions

## P0118

### Manifestation of Menopause/Climateric in the Periodontium

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**Aim:** The purpose of this study is to discuss over the relationship

of menopause/climateric with the periodontal disease, because during this period of the life of women, there is reduction of estrogenic and progesterone hormones, resulting in physiological alterations, with manifestations also occur happen in mouthpiece cavity such as xerostomia and desquamated gingivitis.

**Material and Methods:** A variety of sistemic diseases can manifest in the periodontium especially in the gengiva. The knowledge about periodontal disease elucidates the action of sexual hormones particularly present in menopause or in the climateric.

**Results:** These hormonal alterations can influenced in the severity and the progression of the periodontal disease. On the other hand, all these alterations are worsened by the emotional instability which characterizes menopause and climateric, being this subject of essential importance within the context of the periodontal medicine, because the function of psychosocial factors are already well documented in the immune answer, which guarantees the integrity of the general healthy of the individuals.

**Conclusion:** There is another common discovery in this phase like osteoporoses and osteopeny, which occur in the mouthpiece cavity after accentuated osseous wastage, endangering the dental stability, which can induced the dental loss.

## Topic: Clinical Research: Periodontal systemic interactions

### P0119

#### Periodontal status of patients institutionalized in psiquiatric hospital-Salvador-Bahia-Brazil

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**Aim:** The purpose of the study was to evaluate the periodontal conditions of Juliano Moreira Hospital patients, in Salvador, State of Bahia, Brazil — all of them had mental and behavioral disabilities. This study aimed to design the epidemiological profile of the periodontal disease in a population of 90 individuals were included in this transversal study, age from 15 to 70.

**Material and Methods:** To analyze the probable influences of the psychiatric treatment on the periodontal conditions, the patients were classified into two groups: institutionalized or not. Periodontal assessments included: Silness & Loe plaque index, gingival bleeding upon probing.

**Results:** A higher prevalence of gingivitis presented among these population was found regardless mental disabilities or the specific ways of treatment. In fact it was related to the higher scores of the plaque index — 60% visible ones. This result showed us the poor oral hygiene so common in these kind of patients with intellectual and motor disabilities. Most institutionalized patients had gingival bleeding upon probing. It can be thought that the non-institutionalized patients had a better periodontal conditions.

**Conclusion:** Although 92% of these special patients had no pockets, they should have a non surgical and supportive periodontal treatments. The oral health program and the non-institutionalized mode were basic factors to this suitable prognostic. In summary: all the results contributed to plan the therapeutic and preventive action to the special patients and reinforced the need of an oral assistance politic.

## Topic: Clinical Research: Periodontal systemic interactions

### P0120

#### Full mouth decontamination (FMD) in derailed diabetics with chronic periodontitis

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**Aim:** Diabetes mellitus as well as periodontitis are reported to share mechanisms of pathophysiology, thus favoring bidirectional clinical and metabolic deterioration. The objective of the study presented here was to investigate treatment outcome of FMD in derailed type 2 diabetics with chronic periodontitis (DM2+CP) vs. periodontitis cohort (CP).

**Material and Methods:** After IRB-approval 30 patients participated in this prospective, longitudinal, clinically controlled trial. Hematological markers of inflammation and diabetes management were assessed. Periodontal diagnostics 6 sites/tooth employed full Florida Probe® records at baseline and 6 months. In this phase neither professional diabetological interventions nor dietary adaptations were performed by physicians or nutritional experts.

**Results:** ...indicate an improvement of clinical intervention in both cohorts (DM2+CP and CP). Median\_PPD was reduced by 0.7 and 0.75mm, BOP by 27% and 35%, median\_AL increased by 0.63 and 0.71mm, for DM2+CP as well as CP individuals, respectively (all  $p < 0.01$ , ANOVA). Furthermore, the initially diagnosed diabetic disarrangement improved (median\_HbA1c by 0.76%,  $p \leq 0.05$ ) over the 6 month period of observation.

**Conclusion:** FMD led to an improvement of periodontal status in individuals with DM+CP as well as CP. Furthermore, diabetes management (indicated by HbA1c) recovered after periodontal treatment. Systemic intervention in addition to periodontal treatment may help to improve systemic conditions.

## Topic: Clinical Research: Periodontal systemic interactions

### P0121

#### Salivary biomarkers of metabolic syndrome patients with chronic periodontitis

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Beijing/China

**Aim:** To investigate the salivary levels of proinflammatory cytokines of metabolic syndrome (MS) patients, so as to understand the possible link between periodontitis and the low grade inflammatory condition in MS patients.

**Material and Methods:** 114 dentate and 10 edentulous MS patients (diagnosed according to the most recent definition by the International Diabetes Federation in 2005), 49 dentate systemically healthy subjects were included. Non-stimulated whole saliva of these subjects were collected, levels of interleukin (IL)-1 $\beta$  and IL-6 were analyzed by Enzyme-linked immunosorbent assay. For assessment of periodontitis, the attachment loss (AL) and probing depth (PD) were measured, and both were made to the nearest mm and performed at two sites of each tooth (mesio-buccal and disto-lingual).

**Results:** There was no significant difference on age, education and percentage of smokers between MS and control groups. Mean salivary level of IL-1 $\beta$  in dentate MS patients was higher than that in systemically healthy subjects (656.58 $\pm$ 351.31 VS 567.89 $\pm$ 315.01) and increased with components increasing in MS patients, however both not statistically significant. Mean salivary level of IL-6 in dentate MS patients was also higher than that of systemically healthy individuals, though still without significant difference (16.82 $\pm$ 32.58 vs 10.84 $\pm$ 14.94). And IL-6 level was highest (19.10 $\pm$ 36.56 pg/ml) in MS patients combined with moderate/severe periodontitis, lowest (5.96 $\pm$ 5.54 pg/ml) in both systemically healthy and periodontal healthy/mild periodontitis individuals. Level of IL-1 $\beta$  in edentulous MS patients was significantly lower than that in dentate MS patients (315.61 $\pm$ 310.22 vs 656.58 $\pm$ 351.31pg/ml).

**Conclusion:** Salivary levels of IL-1 and IL-6 might be potential valuable indices when study the association between periodontitis and MS.

Topic: Clinical Research: Periodontal systemic interactions

P0122

### Relationship Between Hyperlipidemia and Periodontal Disease

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Istanbul/Turkey

**Aim:** This study aimed to investigate any association between plasma lipid levels and periodontal disease in subjects attending to the Clinics of Periodontology, Marmara University, Turkey.

**Material and Methods:** Age, gender, body mass index (BMI), nutritional habits, physical activity, alcohol consumption, plasma lipid and glucose levels, white blood cell counts and periodontal clinical parameters were recorded in 160 individuals (57 male, 103 female, age range 35-65 years). Subjects were classified according to their periodontal status as with chronic periodontitis (P+ group)(54%, n=86) or without (P- group)(46%, n=74), and also to their plasma lipid levels as hyperlipidemic (H+ group)(61%, n=97), or normal (H- group)(39%, n=63).

**Results:** Significant positive associations were observed between total cholesterol (TC) and bleeding on probing (BoP) ( $p<0.05$ ), probing depth (PD) ( $p<0.01$ ), clinical attachment level (CAL) ( $p<0.01$ ) and, between CAL and triglyceride ( $p<0.05$ ), low density lipoprotein cholesterol (LDLC) levels ( $p<0.01$ ). In the P+ group; TC ( $p<0.001$ ), LDLC ( $p<0.001$ ) and high density lipoprotein cholesterol ( $p<0.05$ ) were significantly higher than the P- group. In addition, age ( $p<0.05$ ), BMI ( $p<0.01$ ), tooth loss ( $p<0.05$ ), BoP ( $p<0.05$ ), PD ( $p<0.001$ ) and CAL ( $p<0.001$ ) were found to be significantly higher in the H+ group than the H- group.

**Conclusion:** Our results may support the view that there is a relationship between hyperlipidemia and periodontal disease due to the positive correlations between periodontal clinical parameters and plasma lipid levels as well as high TC and LDLC levels in the chronic periodontitis subjects and high BoP, deep pockets and attachment loss in the hyperlipidemic subjects.

Topic: Clinical Research: Periodontal systemic interactions

P0123

### Utility of periodontal exploration in patients with fibromyalgia.

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Seville/Spain

**Aim:** To analyze whether a relationship exists between fibromyalgia and periodontal disease with mitochondrial dysfunction.

**Material and Methods:** The sample took 20 patients (2 males and 18 females) with a mean age of (SD) 50,8 $\pm$ 8,6 years with a mean duration of fibromyalgia (FM) of 13,65 $\pm$ 9,19 years.

Cardiopulmonary, neurological, renal, feverish, rheumatic concomitant diseases, severe psychopathology or psychoactive substance dependence and chronic pain patients with a different origin from FM were excluded.

We evaluated the impact of the disease by testing the Spanish version of Fibromyalgia Impact Questionnaire (FIQ), pain by Visual Analog Scales (VAS) and depression using the standard version of the Beck Depression Inventory (BDI).

A baseline periodontal examination was performed, and a single examiner collected full medical and dental histories. According to the criteria that Machtei et al. described in 1992 to determine the presence of active periodontal disease, we established it when registering CAL $\geq$ 6mm in two or more teeth and one or more sites with PD $\geq$ 5mm. The examiner also collected plaque and bleeding scores.

**Results:** Patients were divided into two groups: one with periodontitis (n=1) and the other without periodontitis (n=19). Patients showed high levels of pain determined by VAS, depression (BDI) and a high disease impact by the FIQ test, all of that characteristic of the fibromyalgia. Only 1 from 20 patients presented periodontitis.

**Conclusion:** The mitochondrial dysfunction and oxidative stress found in a sample of patients with fibromyalgia were characteristic of this disease and do not occur as a result of the presence of periodontal disease.

Topic: Clinical Research: Periodontal systemic interactions

P0124

### Determination of bacteria in the endotracheal tube and oropharynx from the gingival sulcus

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Guatemala/Guatemala

**Aim:** To determine the presence of bacterias in the endotracheal tube and oropharynx from the gingival sulcus

**Material and Methods:** 20 patients that were subjected to surgical procedures under general anesthesia with intubation endotracheal were evaluated. Periodontal clinical parameters were evaluated in all teeth: probing depth (PD), clinical attachment loss (AL), plaque index (PI), bleeding on probing (BOP). 3 bacterial species were evaluated in 3 sites: gingival sulcus, oropharynx and endotracheal

tube. The culture media: Mac Conkey (enterobacterium), Mannitol Salt (staphylococcus aureus), blood Agar (streptococcus)

**Results:** 6 gingivitis (group A) and 14 periodontitis (group B) were evaluated. Age range was 24 to 83 years. Group A presented PD  $\bar{a} \pm 3$  mm and BOP 22%. Group B presented PD  $> 4$  mm and BOP 41% with AL. The IP in the group A 75% and group B 99%. The 50% of patients (group A) showed the same bacteria in the three sites samples and 85% of patients of group B showed the same bacteria in the three sites samples

**Conclusion:** The same bacteria were found in gingival sulcus, in oropharynx and endotracheal tube, so this may be associated with the drag of the bacteria at the time when patients were intubed to receive general anesthesia. These is a high risk of acquiring nosocomial pneumonia by the drag of the bacteria from the mouth into the lung, this may be associated to poor oral hygiene (IP)

Topic: Clinical Research: Periodontal systemic interactions

## P0125

### Tooth loss is related to increased circulating levels of phthalates in a cohort of elderly individuals

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<sup>1</sup>Gävle/Sweden, <sup>2</sup>Uppsala/Sweden

**Aim:** Plastic associated chemicals, such as bisphenol A (BPA) and phthalates are high volume chemicals known to induce physiological activities by their interference with the estrogen and PPAR receptors. Since these activities could influence bone and tissue around the tooth, we aimed to investigate the relationships between circulating levels of these compounds and the number of teeth.

**Material and Methods:** 1,016 subjects all aged 70 years were investigated in the Prospective Investigation of the Vasculature in Uppsala Seniors (PIVUS) study and 947 of the subjects had self-reported their number of teeth. Bisphenol A (BPA) and four Phthalate metabolites were analyzed in serum by a API 4000 liquid chromatograph/tandem mass spectrometer.

**Results:** The median number of teeth were 23 (IQR 17-26). Following adjustment for gender, diabetes, smoking, education level, exercise habits and obesity (BMI), Mono-Methyl Phthalate (MMP) levels were significantly related to the number of teeth in an inverse manner ( $p = 0.0015$ ). Similar tendencies were also seen for BPA and mono-isobutyl phthalate (MiBP) ( $p = 0.07$  and  $p = 0.06$ , respectively).

**Conclusion:** Circulating levels of the phthalate MMP were inversely related to the number of teeth in an elderly population, suggesting that plastic associated chemicals somehow could be involved in tooth loss.

Topic: Clinical Research: Periodontal systemic interactions

## P0127

### Periodontal condition and microcirculation in patients with different number of metabolic syndrome components

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Saint-Petersburg/Russian Federation

**Aim:** The objective of the study was to evaluate dental status and to compare a periodontal condition and blood flow in patients with different number of metabolic syndrome (MeS) components.

**Material and Methods:** 13 women and 25 men aged 34-64 years underwent a dental investigation that included examination of periodontal microvessels by a Doppler ultrasound device «Minimax-doppler-K» with conduction of indirect cold test. Patients were divided into two groups. In the first group were 18 patients with complete MeS (central obesity+2 MeS factors). In the second group were 20 patients with incomplete MeS (central obesity+1 MeS factor). A standard statistic analysis including U-Mann-Whitney test was performed.

**Results:** All patients had poor oral hygiene. A severe form of periodontal disease was diagnosed in the 1 group in 56% of cases and in the 2 group in 25% of cases. There was no difference in values of SBI index ( $2,0 \pm 0,9$  vs  $1,7 \pm 0,8$ ). Periodontal pockets were deeper in the 1 group ( $7,2 \pm 1,9$  vs  $5,6 \pm 0,9$ , mm,  $p < 0,05$ ). Patients with complete MeS had the linear velocity index 26% lower ( $0,184 \pm 0,06$  vs  $0,248 \pm 0,053$ , mm/sec,  $p < 0,05$ ) and the volume velocity index 35% lower ( $0,0771 \pm 0,0233$  vs  $0,1184 \pm 0,0245$ , mm<sup>3</sup>/sec,  $p < 0,05$ ) than did patients of the 2 group. The atypical microvessels reaction was in 100% of cases in the 1 group and in 69% of cases in the 2 group.

**Conclusion:** Persons exhibiting several components of MeS have greater periodontal destruction and microvessels dysfunction than do patients with minor number of MeS components. A dental investigation and periodontal follow-up should be recommended to patients exhibiting even two components of MeS.

Topic: Clinical Research: Periodontal systemic interactions

## P0130

### IL-6 polymorphism and relationships between periodontitis and adiposity in postmenopausal Japanese women

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Niigata/Japan

**Aim:** Interleukin 6 (IL-6) plays critical roles in inflammation and lipid metabolism. Genetic variability of IL-6 has been reported to be associated with adiposity. A haplotype of IL-6 was associated with body mass index (BMI). IL-6 presents at higher levels in plasma from patients with periodontitis. A promoter polymorphism -572G/C influences IL-6 activity in vitro and in vivo. In this study, we investigated if there are associations between IL-6 -572G/C polymorphism and periodontitis, and/or adiposity.

**Material and Methods:** The subject was composed of 217 women who lived in Niigata City, Japan, aged between 55 and 65 years. The data of smoking status, childbirth, and medical history were collected from interview with each woman. Probing depth (PD), loss attachment (LA) and bleeding on probing (BOP) were measured per tooth. IL-6 -572G/C genotypes were determined from genomic DNA. We measured total cholesterol, high- and low-density lipoprotein (HDL and LDL) levels and BMI.

**Results:** There was no significant association between periodontal parameters and IL-6 -572G/C genotypes. Significantly different LDL levels and BMI were observed between -572G/C genotypes



( $p < 0.05$ ). In the IL-6 -572CC genotype, significant correlations were found between the number of  $\geq 4$ mm PD and body weight ( $r = 0.190$ ,  $p = 0.024$ ), between the percentage of BOP and body weight ( $r = 0.220$ ,  $p = 0.009$ ).

**Conclusion:** The IL-6 -572G/C polymorphism represented no significant association with the parameters of periodontitis, but may play a role in adiposity and/or the correlation between periodontal parameters and body weight in postmenopausal Japanese women.

Topic: Clinical Research: Periodontal systemic interactions

## P0131

### Association of preterm and low-weight birth with periodontal disease

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Mashhad/Iran

**Aim:** In this study we tend to measure gingival and periodontal status in mothers with preterm delivery and comparing these finding with those mothers with term delivery.

**Material and Methods:** This study was done on 70 women (mean age 25.01 yrs) referring to Imam Reza hospital. 35 patients were considered as case group (women with preterm delivery) and 35 patients were as control group (women with term delivery). Mean probing depth (MPD), percent of sites with more than 3 mm in probing, bleeding Index (BI), Plaque Index (PI), Extent and Severity Index (Ext.& Sev.) Indices were measured using mirror and William's periodontal probe.

**Results:** Significant differences were found in MPD, percent of sites with more than 3 mm in probing, BI, PI, Ext. and Sev. indices in case and control groups ( $p < 0.001$ ). The mean of the above indices were higher in study groups than control groups. Plaque index were more in study groups than control groups ( $p < 0.007$ ).

**Conclusion:** Gingival and periodontal disease can be a risk factor for preterm delivery.

Topic: Clinical Research: Periodontal systemic interactions

## P0132

### Peroxisome proliferator-activated receptor gamma polymorphism in postmenopausal Japanese women with periodontitis and osteoporosis

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Niigata/Japan

**Aim:** Peroxisome proliferator-activated receptors (PPARs) are transcription factors belonging to the nuclear hormone receptor superfamily. Accumulating evidence demonstrates the involvement of PPAR $\gamma$  in skeletal metabolism. PPAR $\gamma$  activation can down-regulate the bone resorption in rat periodontitis models. Our previous study suggested the PPAR $\gamma$ Pro12Ala polymorphism to be a susceptibility factor for periodontitis in pregnant women. In this study, we investigated if there

are associations between PPAR $\gamma$ Pro12Ala polymorphism, periodontitis and/or osteoporosis in postmenopausal Japanese women.

**Material and Methods:** The subject was composed of 359 women who lived in Niigata City, aged between 55 and 74 years. The data of smoking status, childbirth, and medical history were collected from interview with each woman. Probing depth (PD), loss attachment (LA) and bleeding on probing (BOP) were measured per tooth. PPAR $\gamma$  polymorphisms were determined from genomic DNA. We also measured the serum 25-hydroxyvitamin D (25(OH)D) and type I collagen cross-linked N-telopeptides (NTX) levels.

**Results:** There were significant associations between PPAR $\gamma$ Pro12Ala genotype and the percentage of  $\geq 4$ mm LA, PPAR $\gamma$ Pro12Ala genotype and NTX. In the PPAR $\gamma$ Pro12Ala and Ala12Ala genotypes, we found significant correlations between the percentage of  $\geq 4$ mm PD and the serum 25(OH)D ( $r = 0.287$ ,  $p = 0.048$ ), the numbers of  $\geq 6$ mm PD and the serum 25(OH)D ( $r = 0.358$ ,  $p = 0.012$ ), the percentage of  $\geq 4$ mm LA and NTX ( $r = 0.345$ ,  $p = 0.016$ ), and the percentage of BOP and NTX ( $r = 0.461$ ,  $p = 0.001$ ). These correlations were not observed in the PPAR $\gamma$ Pro12Pro genotype.

**Conclusion:** The PPAR $\gamma$ Pro12Ala polymorphism may play a role in the correlation between periodontitis and systemic bone metabolism in postmenopausal Japanese women.

Topic: Clinical Research: Periodontal systemic interactions

## P0133

### High level of oxidized low-density lipoproteins is present in gingival crevicular fluid from patients with diabetes mellitus

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Tokyo/Japan

**Aim:** Recently, several studies have demonstrated the relationship between diabetes mellitus (DM) and periodontal disease. Oxidative stress is an exacerbation factor in various diseases including DM. Previously we showed that oxLDL was present in gingival crevicular fluid (GCF) (Sakiyama et al. J Periodont Res 2010). In this study, we investigated levels of LDL and oxLDL in the GCF from patients with DM who are hospitalized to learn diet control.

**Material and Methods:** GCF and blood samples from 20 patients with DM hospitalized in Showa University Hospital and 10 healthy subjects were collected in this study. The GCF was obtained with paper points. The amounts of oxLDL and LDL were measured by sandwich ELISA assays. Blood samples were used for examination of biochemical parameters.

**Results:** The levels of oxLDL/LDL ratio in GCF were about 900 times higher than that in plasma from the same patients. Moreover, the levels of oxLDL/LDL ratio in GCF from DM patients were higher than healthy. The oxLDL/LDL ratio in GCF did not correlate with any systemic parameters such as HbA1c suggesting that oxLDL/LDL ratio in GCF is an independent risk marker for DM.

**Conclusion:** These results indicate that the oxidative modification of LDL is more pronounced in GCF than in plasma from the patients with DM. Exposure of LDL to oxygen in the atmosphere might cause oxidative modification of LDL when it

is exuded into GCF. GCF can be collected without substantial body damage on the patient, measurement of oxLDL in GCF may be useful for the early diagnosis of DM.

Topic: Clinical Research: Periodontal systemic interactions

## P0134

### Recurrent Pyogenic Granuloma in Pregnancy: A Case Report.

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**Aim:** Introduction: Pyogenic granuloma (PG) is a reactive enlargement that is an inflammatory response to local irritation such as calculus, a fractured tooth, rough dental restoration, or hormones (pregnancy) and rarely associated with bone loss. A case of a gigantic PG with two recurrences during pregnancy is presented.

**Material and Methods:** Case report: A 20-year old, 28 weeks pregnant woman applied in 2010 with a gigantic localized gingival overgrowth which was later diagnosed histologically as granuloma gravidarum (PG). The related teeth had bone loss and were mobile. Non-surgical therapy was performed immediately. 2 weeks after non-surgical therapy, an incisional biopsy was accomplished to minify the lesion enough to relieve mastication. When the patient was examined 4 weeks post delivery, there was just a healthy gingiva in the lesion site. At 12 months post delivery, she was pregnant again for 8 weeks and there was recurrence of the lesion in the same area.

**Results:** Discussion: The recurrence of the lesion is due to pregnancy hormones and poor oral hygiene. The patient was put into a strict oral care programme and no surgical intervention is planning until the end of pregnancy. Extraction of the related teeth might be an obligation if the patient can not deal with the requirements of good oral hygiene standards.

**Conclusion:** PG has a high recurrence rate and pregnancy hormones exacerbate the symptoms. Poor oral hygiene is a main factor for the recurrence of the lesion. Surgical intervention during pregnancy is not always choice of treatment in the first and third trimester and should only be performed under specific obligations.

Topic: Clinical Research: Periodontal systemic interactions

## P0135

### Periodontal infection and systolic blood pressure

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**Aim:** Periodontal infection has been found to be associated with elevated blood pressure, but evidence is still scant. The aim of this study was to investigate the relation of periodontal infection to systolic blood pressure.

**Material and Methods:** The study was based on a subpopulation of the Health 2000 Survey, which included dentate non-diabetic, non-rheumatic subjects who did not have diagnosed hypertension or hyperlipidaemia, aged 30–49 years (n=1881). Periodontal

infection was defined as the presence of teeth with deepened (4 mm deep or deeper) periodontal pockets, and was categorised into five categories (0, 1–3, 4–6, 7–11, 12 or more). Systolic blood pressure was measured in mm/Hg, and was used as a continuous variable. Confounding variables included gender, age, education, physical activity, smoking, body mass index, and the serum levels of triglycerides, HDL-C and LDL-C.

**Results:** We found no consistent association between periodontal infection and systolic blood pressure. The predicted values for systolic blood pressure, obtained from multivariate linear regression models, in the categories of the number of teeth with deepened periodontal pockets (0, 1–3, 4–6, 7–11, 12 or more) were 118.6 mm/Hg, 117.3 mm/Hg, 118.5 mm/Hg, 118.3 mm/Hg and 117.1 mm/Hg, respectively.

**Conclusion:** Periodontal infection was not found to be associated with systolic blood pressure in this low-risk population. The results of this study do not support the role of periodontal infection in the aetiology of elevated systolic blood pressure.

Topic: Clinical Research: Periodontal systemic interactions

## P0136

### Microbiological analyses of biofilms in patients with prosthetic joint infections (PJI) and periodontitis – a interdisciplinary pilot study

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**Aim:** Infections of the prosthetic joint and the periodontium are caused by biofilm-associated disorders. The purpose of the present study was to study subgingival biofilm of periodontitis infected teeth and of prosthetic joint infections (PJI).

**Material and Methods:** Microbiological samples were taken from 8 patients with PJI and chronic periodontitis. Paper-points were used to harvest biofilm samples from the subgingival tooth surface and the explanted orthopaedic implants. Microbiological test (checkerboard + RT-PCR) was carried out to analyse the biofilm.

**Results:** Few bacterial species were found at the standard detection level ( $1.0 \times 10^5$  bacterial cells). The microbiological analysis based on samples from hip implants identified that in most samples Traces of bacteria from hip samples at the  $1.0 \times 10^4$  detection level were commonly identified and five subjects had hip bacterial samples that were positive for several species. Three subjects had traces of *Staphylococci* sp. in hip bacterial samples and traces of *Pseudomonas aeruginosa* were found in 4 subjects. Hip samples from two subjects were negative for all 74 species studied. Samples from teeth were positive in most subjects. Thus *Porphyromonas gingivalis*, *Tannerella forsythia*, *Campylobacter rectus*, *Fusobacterium nucleatum*, and *Prevotella intermedia* were found in 2/8 subjects at levels  $\geq 1.0 \times 10^5$  cells. These two subjects also presented with low bacterial counts in samples taken from periodontal pockets. The distribution of bacteria from periodontal pockets and hip samples were similar.

**Conclusion:** Biofilm of periodontitis infected subgingival tooth surfaces have similar bacteria like infected surfaces of prosthetic joints.

Topic: Clinical Research: Periodontal systemic interactions

## P0137

### Determination Of Periodontal Status In Metabolic Syndrome Patients

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**Aim:** Periodontal and oral status in patients with metabolic syndrome, is important for planning preventive and therapeutic treatments. The aim of this study is to determine the periodontal/oral status, and oral hygiene habits in patients with metabolic syndrome.

**Material and Methods:** A hundred patients with metabolic syndrome (71 female, 29 male, ages 35 to 80 years) living in İzmir were enrolled. Demographic characteristics were determined and a questionnaire (smoking, systemic diseases, frequency of dental examination and oral hygiene practice) applied. Community Periodontal Index (CPI), plaque accumulation, bleeding on probing, number of filled teeth, usage of removable/fixed dentures and tooth loss were assessed.

**Results:** The prevalence of bleeding on probing was 99%, plaque accumulation was 100% and smoking was 46%. None of the patients had healthy sextants with the score of CPI=0. CPI=1 was 2%, CPI=2 was 42%, CPI=3 or 4 was 56% among the patients. Patients noticed that, 38% brush their teeth once/day, 36% brush twice a day or more, 4% of subjects use interdental cleaning devices. Although 49% of the patients had dental therapy in the last one year, periodontal disease was common among them. The ratio of complete dentition was 7%. The need for total/partial prosthesis was 39%.

**Conclusion:** The data of this study showed that periodontal and dental status of metabolic syndrome patients were very poor. Generally the patients were deficient about the information of daily plaque control techniques. For metabolic syndrome patients, protective and essential treatment procedures have to be planned improved.

Topic: Clinical Research: Periodontal systemic interactions

## P0138

### Periodontitis and diabetes – a cross-sectional study performed during a national diabetes information program

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**Aim:** Aim of this study was to evaluate the periodontal and diabetic conditions and the level of information regarding the correlation between periodontitis and diabetes on type-1- and type-2-diabetics.

**Material and Methods:** 448 subjects, 111 non-diabetics (ND), 101 type-1-diabetics (T1D), and 236 type-2-diabetics (T2D), aged between 6 and 83 years were investigated for diabetes and oral health during a national diabetes information program ("diabetestour"). The recorded diabetes-associated parameters included glycohemoglobin (HbA1c), blood glucose (BG), and

body mass index (BMI). The dental parameters comprised the decayed/missing/filled teeth index (DMFT) and the periodontal screening index (PSI). History of diabetes and periodontitis, level of information concerning the correlation between diabetes and periodontitis, and smoking habits were assessed using questionnaires. Statistical analysis was performed by SAS 9.2 (SAS Institute Inc., Cary, NC, USA) and SPSS Statistics Version 19.0 (SPSS Inc., Chicago, IL, USA).

**Results:** DMFT was significantly higher in T2D subjects when compared to T1D subjects ( $p < 0.001$ , t-test). PSI was significantly higher in T2D subjects when compared to ND and T1D subjects ( $p = 0.005$ ,  $p < 0.001$ , t-test). BMI was significantly higher in diabetics with periodontitis when compared to diabetics without periodontitis ( $p = 0.002$ , multivariate logistic regression). T1D subjects were significantly better informed about the correlation between diabetes and periodontitis when compared to ND and T2D subjects ( $p < 0.001$ , chi-square test). Two-thirds of the T2D subjects were not aware of this correlation.

**Conclusion:** Our data suggest a predisposition for periodontitis and a deficiency of information concerning the correlation between diabetes and periodontitis in T2D subjects.

Topic: Clinical Research: Periodontal systemic interactions

## P0140

### Maternal periodontitis and preterm birth: a multicenter case-control study in the Portuguese Population

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**Aim:** Since 1996, a number of studies have investigated the potential relationship between periodontitis and preterm birth. There is compelling evidence that a link between the two conditions exists, implicating periodontitis as a risk factor for preterm birth (PB). However, results have been controversial and more research is needed in order to confirm or discard this association. The purpose of this study was to determine whether maternal periodontitis could be associated with preterm birth.

**Material and Methods:** A multicenter case-control study was conducted in Dr. Daniel de Matos Maternity, in Coimbra and in Dr. Alfredo da Costa Maternity, in Lisbon. The case group ( $n = 41$ ) was defined as postpartum women with spontaneous preterm labour (gestational age  $< 37$  weeks) as a result of premature labour or premature rupture of membranes. The control group ( $n = 51$ ) included postpartum women with term birth (gestational age  $\geq 37$  weeks). Detailed data about the current pregnancies was obtained and periodontal examinations were performed with the subjects lying flat in the maternity bed.

**Results:** Women with periodontitis had 5,19 times greater odds of preterm delivery, than did periodontally healthy women (OR 5,19: 1,86-14,46; CI 95%).

**Conclusion:** The obtained data in this population revealed a significant association between the presence of periodontitis and preterm birth. However, there is a clear need for more studies to confirm the observed association.

## Topic: Clinical Research: Periodontal systemic interactions

## P0141

**Arterial stiffness is associated with periodontitis**

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**Aim:** Arterial stiffness (AS) is a contributor to the pathophysiology of cardiovascular disease. Recently, in intervention studies, it was shown that periodontitis might be related to this process. Therefore, we aimed to assess cross-sectionally AS in periodontitis patients and a control group.

**Material and Methods:** Systemically healthy periodontitis patients (n=26) were compared to a systemically healthy reference population (n=50), having unknown periodontal status. AS was measured employing pulse-wave-velocity (PWV), a non-invasive chair-side function test (TensioMedTM, Hungary). Systolic blood pressure (SBP), heart rate (HR) and the backward wave created by reflection at vascular branching (return time [RT]) were also measured.

**Results:** Periodontitis patients were comparable in age ( $48.7 \pm 7.1$  vs.  $45.6 \pm 6.6$  years;  $p = 0.63$ ), had a higher BMI ( $26.4$  vs.  $23.0$ ;  $p = 0.001$ ) and smoked more often ( $50\%$  vs.  $14\%$ ;  $p = 0.001$ ) compared to the reference population. Periodontitis patients showed significantly increased AS (PWV  $8.26 \pm 1.6$  m/s versus  $7.46 \pm 1.19$  m/s,  $p = 0.013$ ). The mean HR ( $64.7 \pm 10.7$  vs.  $57.6 \pm 7.7$ ,  $p = 0.001$ ) and mean RT ( $127.1 \pm 32.8$  ms vs.  $147.0 \pm 18.8$  ms,  $p = 0.001$ ) were also significant elevated in periodontitis patients respectively. After adjustments for potential confounders (age, gender, BMI, smoking and SBP), PWV ( $p = 0.048$ ) and RT ( $p = 0.008$ ) remained significantly higher in patients.

**Conclusion:** Periodontitis patients showed elevated levels of AS and HR. It is still unknown how periodontitis contributes to the increase of AS. Further intervention studies are being conducted to evaluate whether periodontal treatment will reduce AS.

## Topic: Clinical Research: Periodontal systemic interactions

## P0142

**Lignous Periodontitis and Lignous Conjunctivitis Due to Plasminogen Deficiency: a Case Report**

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**Aim:** Lignous gingivitis is a rare condition characterized by nodular gingival enlargement with ulceration; and mostly related with ocular lesions. The periodontal lesions was first linked to severe inherited type I plasminogen deficiency. The aim of this rare case report is to manage lignous periodontitis due to plasminogen deficiency

**Material and Methods:** An 19-year-old Turkish girl was referred to the Department of Periodontology at Zonguldak Karaelmas University in 2011, for evaluation of painless, massive, membranous, nodular and fragile enlargements involving the maxillary and mandibular gingivae in all areas. Radiography showed bone loss adjacent to the gingival lesions. In her medical evaluation she had ocular lesions on her right, and the medical history was otherwise clear. There was no family history of a

similar disease, no consanguinity between her parents. She underwent scaling and root planing, chlorhexidine rinsing, and gingivectomies and gingivoplasties; however, the lesions recurred within 3 months, despite regular control to maintain good oral hygiene. After periodontal treatment she was referred to Department of Hematology for her medical treatment.

**Results:** Gingival biopsy was performed during periodontal therapy. Histopathologic examination revealed superficial necrosis, ulcerations and actinomyces microorganisms dispersed along the surface epithelium. Areas of papillary epithelial hyperplasia were also noted. Edema, fibrin deposition and prominent inflammatory cell infiltration were observed in the subepithelial area.

**Conclusion:** This case report showed that plasminogen deficiency could result with lignous periodontal and ocular lesions and management of these lesions were quiet complicated.

## Topic: Clinical Research: Periodontal systemic interactions

## P0143

**Oral Hygiene and Periodontal Condition in Pregnancy**

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**Aim:** The aim of this study was to assess the quality of hygiene in the oral cavity, implemented under the domestic prevention of pregnant women, and the impact of various treatments on subjective symptoms of bleeding gums. Respondents were analyzed in the subjective assessment of bleeding before and during pregnancy.

**Material and Methods:** Group of 100 pregnant women aged 23-38 years, in the third trimester of pregnancy, between 28 and 36 weeks of gestation. The research tool was a self-completion questionnaire consisting of 18 questions. 15 questions concerned the main part of the work, 3 were the metrical. Sampling was used to nonprobabilistic arbitrary choice. For the statistical analysis used a  $\chi^2$  test of independence using the Monte Carlo simulation method. In tests carried out assumed level of significance  $p = 0.05$ . The analysis was performed in R - program.

**Results:** The analysis shows that, during pregnancy observed increase in the prevalence of analyzed symptoms. Before becoming pregnant 31.03% of the respondents reported bleeding gums, and during pregnancy, the occurrence of bleeding increased to 68.97%. The gingival swelling increased almost threefold, from 26.09% to 73.91%, the sensitivity of the gums before pregnancy was recorded for 40% of respondents. In the adopted level of significance  $p = 0.05$  can be concluded that the identified differences between the appearance of symptoms characteristic of gingivitis before and during pregnancy are statistically significant.

**Conclusion:** After analyzing the obtained results it can be concluded that gingival inflammatory symptoms during pregnancy significantly increases compared to the prevalence of these symptoms before pregnancy.



Topic: Clinical Research: Periodontal systemic interactions

## P0145

### The relationship between the preterm low birth weight infant and the Periodontal disease pathogenetic bacteria in maternal saliva

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**Aim:** To compare the periodontal parameters of the mothers of preterm and/or low birth weight (PLBW) and normal birth weight (NBW) infants. To compare the detection rate of three anaerobic microorganisms including *Porphyromonas gingivalis* (Pg), *Tannerella forsythia* (Tf), *Treponema Denticola* (Td) in their saliva.

**Material and Methods:** 111 retrospective cases were gathered from 4 hospitals in Beijing urban and suburban. PLBW group included 74 subjects and NBW group included 37 subjects. According to the PCR results in their saliva. They were divided into positive group and negative group of Pg, Tf, Td. The periodontal examinations including plaque index (PI), probing depth (PD), bleeding index (BI), clinical attachment loss (CAL) were performed in 1-1.5 years after preterm.

**Results:** The detection rates of Pg in PLBW and NBW group were 93.7% (69) and 81.6% (30) respectively (P 0.001). The clinical parameters of Pg positive were significantly higher than those of Pg negative group. The birth weight (g) of Pg positive group (2465.25±821.44) was significantly lower than that of Pg negative group (3272.50±1112.10) (P 0.001). The detection rates of Tf in PLBW and NBW were 84.6% (62) and 94.7% (35) respectively. The detection rates of Td in PLBW and NBW were 84.6% (62) and 89.5% (33) respectively. The CAL and PD of Tf positive group were significantly higher than Tf negative group. The PD and BI of Td positive group was higher than negative group, they were significantly difference.

**Conclusion:** There is high levels of Pg, Tf and Td in saliva of both PLBW and NBW groups. The detection of Pg could be related to PLBW. Maternal periodontal infection may be a risk factor for PLBW.

Topic: Clinical Research: Periodontal systemic interactions

## P0146

### Influence of doxycycline on clinical and microbiological parameters and MMP-8 levels in well-controlled type 2 diabetic patients with periodontal disease

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**Aim:** To investigate the influence of doxycycline on clinical and microbiological parameters and MMP-8 levels in well-controlled type 2 diabetic patients with periodontal disease.

**Material and Methods:** A total of 54 chronic periodontitis patients were included in the present study (29 with type 2

diabetes with HbA1c<7 and 25 systemically healthy). Scaling and root planning (SRP) was performed in all subjects and doxycycline (100mg/daily for 3 weeks) was administered to 15 diabetic patients at 3 months after SRP. Pocket depth, clinical attachment level, recession, bleeding and plaque indices were recorded at baseline and at 3, 6 and 12 months. At the same time points, subgingival plaque samples from 2 sites of each patient were analyzed by "checkerboard" DNA-DNA hybridization for *P. gingivalis*, *T. forsythia*, *T. denticola*, *A. actinomycetemcomitans*, *C. rectus*, *F. nucleatum*, *P. nigrescens*, *P. intermedia* and *V. parvula* and gingival crevicular fluid (GCF) samples from the same sites were analyzed with ELISA for MMP-8 levels.

**Results:** Clinical and microbiological parameters were homogenous at baseline (Levene's test,  $p>0.05$ ), but MMP-8 levels were statistically significantly higher in diabetic patients. Similar clinical and microbiological improvements were observed after SRP for both groups (Mann-Whitney test,  $p>0.05$ ), while adjunctive doxycycline resulted mainly in statistically significant reduction of MMP-8 levels (z-test, with Benferroni correction).

**Conclusion:** Findings from the present study indicate, that in well-controlled type 2 diabetic patients the adjunctive use of doxycycline could be beneficial for reduction of MMP-8 levels and therefore controlling subclinical inflammation.

Topic: Clinical Research: Periodontal systemic interactions

## P0147

### Lack of association between periodontal infection and diagnosed hypertension

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**Aim:** Periodontal infection has been associated with cardiovascular diseases. The aim of this cross-sectional study was to investigate the association between periodontal infection and hypertension.

**Material and Methods:** This study was based on a subpopulation of the national Health 2000 –Survey in Finland. The study population consisted of dentate, non-diabetic, non-smoking individuals aged 30–49 years (n=1296). The number of teeth with deepened ( $\geq 4$  mm) and deep ( $\geq 6$  mm) periodontal pockets were used as explanatory variables and diagnosed hypertension (criteria: systolic blood pressure  $\geq 140$  mmHg or diastolic blood pressure  $\geq 90$  mmHg or use of antihypertensive therapy) as the outcome variable. Adjusted odds ratios (OR) and 95% confidence intervals (CI) were estimated using logistic regression models.

**Results:** There was no consistent association between the number of teeth with deepened ( $\geq 4$  mm) (adj. OR 0.99, 95% CI 0.96–1.02) or deep ( $\geq 6$  mm) (adj. OR 1.00, 95% CI 0.93–1.07) periodontal pockets and diagnosed hypertension after adjusting for age, gender, body mass index, physical activity, serum lipid composition, alcohol consumption and daily energy intake.

**Conclusion:** Contrary to previous findings, periodontal infection did not appear to be related to diagnosed hypertension in the present non-diabetic and non-smoking population aged 30–49 years.

## Topic: Clinical Research: Periodontal systemic interactions

**P0148****Necrotizing periodontitis as severe complication of CVID (common variable immunodeficiency): a case report**

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**Aim:** Introduction:

Immune response is pivotal in the development and progression of periodontal diseases. There is evidence in the literature for the correlation of acquired immunodeficiency syndrome and necrotizing ulcerative periodontitis, but no report regarding one of the most common immunodiseases, the common variable immunodeficiency (CVID).

**Material and Methods:** Case report:

The medical history of an 18-year old female patient, suffering from periodontal disease for several years in combination with CVID, is presented. Due to a non-compliance to her medical treatment a complete destruction of periodontal system was observed, subsequently leading to the extraction of all teeth in the upper and lower jaw. Clinical, biochemical, microbiological and radiographic examinations are presented.

**Results:** Discussion:

To our knowledge we demonstrate in this case report for the first time the interaction of the common variable immunodeficiency and a devastating necrotizing periodontitis with complete failure of the periodontal system. Therapeutic aspects for CVID-patients suffering from periodontitis are discussed.

**Conclusion:** : The report highlights the importance of the substitution of immunoglobulines and intensive dental hygiene in CVID-patients, and the devastating effect of the non-compliance in such a patient.

## Topic: Clinical Research: Periodontal systemic interactions

**P0149****Association between BOP and glycemic control in a non-diabetic periodontitis population**

O.S. Kim, Y.S. Jung, M.H. Shin, Y.J. Kim, H.J. Chung

Gwangju/Korea

**Aim:** The purpose of this study was to investigate the association between the periodontal disease and hemoglobin A1c (HbA1c) in non-diabetic adult Koreans.

**Material and Methods:** Cross-sectional data on 3,867 persons over 50-years-of-age without diabetes mellitus were obtained from the Donggu Study conducted from 2008–2010. Periodontal status, HbA1c, smoking status, body mass index (BMI), serum cholesterol, blood pressure, and demographic variables were assessed. Periodontal status was quantified as the percentage of periodontal sites with a pocket depth  $\geq 4$  mm (PD4%) or with bleeding on probing (BOP%). Analysis of covariance was used to compare the means of HbA1c according to the tertile of the PD4% and BOP%.

**Results:** After adjusting for confounding factors, PD4% and BOP%

were positively associated with HbA1c levels. While the statistically significant difference of HbA1c level in BOP% remained after adjusting for PD4%, the significant difference of HbA1c level in PD4% among tertiles disappeared after adjusting for BOP%.

**Conclusion:** BOP, the index of present periodontal inflammation, is associated with elevated HbA1c level independent of PD in non-diabetic individuals. These data add to the evidence supporting the view that periodontal inflammation can be a risk factor of developing diabetes mellitus.

## Topic: Clinical Research: Periodontal systemic interactions

**P0150****The association between periodontal disease, tooth loss, and bone mineral densities**

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Gwangju/Korea

**Aim:** We investigated the association between CAL, one measurement of the severity of periodontal disease, number of teeth present and bone mineral density

**Material and Methods:** The study population consisted of 5504 people aged 50 years and older who participated in the Dong-gu Study between 2008 and 2010. BMD was measured by Lunar Prodigy dual-energy X-ray absorptiometer. Oral examinations, including number of teeth present and clinical attachment loss (CAL) were assessed. The CAL values were divided into tertiles in terms of the percentage of the site with the CAL equal to or greater than 4 mm. Analysis of covariance was used to compare the adjusted means of the BMD in lumbar spine and right femoral neck according to the group of tooth number and the tertiles of the CAL.

**Results:** The BMDs of the lumbar and femur showed significant association with the number of teeth present in the male subjects but not in the female. On the other hand, the association between CAL and lumbar BMD was statistically significant in the females and males although statistical significance was lower in the males. In contrast, in terms of the femoral neck BMD, neither was statistically significant difference nor any trend observed in gender.

**Conclusion:** Our data indicates that the number of teeth present may be an important determinant of the BMD, especially in the males, whereas CAL may contribute negatively to Lumbar BMD in gender. These findings suggest that it may be an effective method by improving periodontal status and oral hygienes as strategy to prevent osteoporosis.

## Topic: Clinical Research: Periodontal systemic interactions

**P0151****Bone level density and cytokine levels in inflamed gums of patients with juvenile idiopathic arthritis**A.A. Souza<sup>1</sup>, F.S.F.F. Braga<sup>2</sup>, L.A. Miranda<sup>3</sup>, C.M. Figueredo<sup>2</sup>, R.G. Fischer<sup>2</sup>, A. Gustafsson<sup>4</sup><sup>1</sup>Nova Friburgo/Brazil, <sup>2</sup>Rio De Janeiro/Brazil, <sup>3</sup>Porto Alegre/Brazil, <sup>4</sup>Stockholm/Sweden

**Aim:** Our aims were to evaluate radiographic alveolar bone density (ABD) and to analyze interleukin (IL) -1 $\beta$ , IL-8, interferon (INF) - $\gamma$  and elastase activity levels in the gingival crevicular fluid (GCF) of Juvenile Idiopathic Arthritis (JIA) patients compared to controls.

**Material and Methods:** 16 JIA patients (mean age  $16.4 \pm 2.1$  years) and 11 systemically healthy controls (mean age  $16.2 \pm 2$  years) were examined. Bite-wings radiographies were taken and the ABD was measured by a digital radiographic system. The GCF was collected by an intracrevicular washing method and IL-1 $\beta$ , INF- $\gamma$ , IL-8 levels were measured by a multiplex bead immunoassay (Luminex). Elastase activity levels were measured by an enzymatic assay.

**Results:** ABD, sites with probing pocket depth  $\geq 4$ mm, bleeding on probing and IL-8 levels were significantly lower in JIA patients compared to controls ( $p=0.001$ ,  $p=0.019$ ,  $p=0.011$ ,  $p=0.002$ , respectively). ABD positively correlated to IL-8 levels in the overall sample ( $r_s=0.48$ ,  $p=0.01$ ). In GCF, significant correlations were found between IFN  $\gamma$  levels and elastase activity levels in the overall sample ( $r_s=0.5$ ,  $p=0.007$ ) and in the JIA group ( $r_s=0.69$ ,  $p=0.003$ ). IL-8 positively correlated to IL-1 $\beta$  in the overall sample ( $r_s=0.57$ ,  $p=0.002$ ) and in the JIA group ( $r_s=0.69$ ,  $p=0.003$ ). Moreover, IL-8 was correlated to elastase activity levels in the JIA group ( $r_s=0.62$ ,  $p=0.01$ ).

**Conclusion:** In conclusion, ABD and IL-8 levels were lower in JIA patients compared to controls. ABD was correlated to IL-8 levels in gingival fluid and appears to be not influenced by medication and rheumatic disease activity.

Topic: Antimicrobial treatment

P0152

### Photodynamic therapy as a safe antibacterial procedure in periodontics

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**Aim:** In recent decade, there has been a growing interest in the use of dental lasers for treatment of periodontal diseases. Photodynamic therapy (PDT) is a selective modality of killing targeted cells, mostly known for its application in neoplasms. PDT can be considered to be an adjunctive method for the elimination of periodontal bacteria from the pocket without harms for the resident tissues. Therefore, PDT may decrease using systemic antibiotics and enhance the effect of mechanical treatments of periodontal defects.

**Material and Methods:** manual and electric search done in pubmed data from 1990 to 2011. A systematic review performed to calculate the in vivo and clinical trials using photodynamic therapy in non surgical periodontal treatments.

**Results:** The use of PDT added to conventional treatment leads to: a major reduction of microbial load, clinical and bacteriological effects which are comparable to those reported with the subgingival debridement method, may serve as an adjunctive therapy to mechanical treatment in periodontal pockets with PD  $\geq 5$ mm to reduce the presence of bleeding, inactivate bacterial virulence factors, and inactivating host cytokines that impair periodontal restoration. Therefore, PDT treatment may provide a more favorable healing environment. In addition, repeated PDT adjunctive to debridement yielded improved clinical outcomes in residual pockets in maintenance patients.

**Conclusion:** Available data showed that PDT may be an effective alternative for control of bone loss in furcation areas in periodontitis.

Also, some clinical trial demonstrated that PDT and SRP affected different groups of bacteria, suggesting that their association may be beneficial for the non-surgical treatment of aggressive periodontitis.

Topic: Antimicrobial treatment

P0153

### The Effect of the Herbal Product Persica on Porphyromonas gingivalis and Actinobacillus actinomycetemcomitans

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Eshragi

Tehran/Iran

**Aim:** The plant *Salvadora persica* is used for oral hygiene in many parts of the world. As well as mechanical removal of plaque, antibacterial properties have been suggested. The aim of this study was to assess the antimicrobial activity of the herbal product Persica containing *Salvadora persica*, against the periodontopathogens *Porphyromonas gingivalis* and *Actinobacillus actinomycetemcomitans* in vitro.

**Material and Methods:** Fifty adults with moderate-advanced periodontitis were recruited. Using paper points subgingival plaque samples were taken from pockets  $\geq 5$ mm. The samples were subjected to microbial culture to yield *P.gingivalis* and *A.actinomycetemcomitans*. The ditch plate method was used for antimicrobial susceptibility testing of the bacteria to Persica and for comparison to Chlorhexidine and distilled water. Inhibition zones of microorganisms around the ditches were measured in millimeters.

**Results:** There was a significant difference ( $P=0.001$ ) between antimicrobial activity of Chlorhexidine compared to Persica and Persica compared to water against *P.gingivalis*. There was a significant difference ( $p < 0.001$ ) between the antimicrobial activity of Chlorhexidine and Persica, with respect to *A. actinomycetemcomitans*. There was no significant difference ( $P=0.317$ ) between the antimicrobial ability of Persica and water against *A.actinomycetemcomitans*.

**Conclusion:** The herbal product Persica had moderate antimicrobial activity against *P.gingivalis* and negligible antimicrobial activity against *A.actinomycetemcomitans* compared to the gold standard antimicrobial agent 0.2% Chlorhexidine.

Topic: Antimicrobial treatment

P0154

### Specificity of Antimicrobial Peptide LL-37 to Neutralize Periodontopathogenic Lipopolysaccharide Activity in Human Oral Fibroblasts

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**Aim:** The antimicrobial peptide LL-37 is known to have a potent lipopolysaccharide (LPS)-neutralizing activity in various cell types. Due to observed heterogeneity within periodonto-

pathogenic LPS, we hypothesized that LL-37 had specificity to neutralize such LPS activity. The present study, therefore, aimed to investigate the LPS-neutralizing activity of LL-37 to various periodontopathogenic LPS in interleukin (IL)-8 production after challenged them in human oral fibroblasts.

**Material and Methods:** Human periodontal ligament fibroblasts (PDLF) and gingival fibroblasts (GF) were cultured from biopsies of periodontal ligament and gingival tissues. After cell confluence in 24 well plates, LPS (10 µg/ml) from *Porphyromonas gingivalis*, *Prevotella intermedia*, *Fusobacterium nucleatum*, and *Aggregatibacter actinomycetemcomitans* were added with or without LL-37 (10 µg/ml). After 18 hours, the supernatant was collected and analyzed by enzyme-linked immunosorbent assay.

**Results:** All periodontopathogenic LPS statistically significantly induced IL-8 production in both PDLF and GF ( $P < 0.01$ ). After neutralization with LL-37, both PDLF and GF showed a statistically significant reduction in IL-8 production as comparing to LPS-treated groups ( $P < 0.01$ ); however, the percentage of reduction in IL-8 production in PDLF appeared to be higher than in GF. In addition, the percentage of reduction in IL-8 production varied considerably in according to each periodontopathogenic LPS.

**Conclusion:** The antimicrobial peptide LL-37 had an ability to suppress periodontopathogenic LPS-induced IL-8 production both in PDLF and GF. Its LPS-neutralizing activity revealed specificity to periodontopathogenic LPS, demonstrating the observed heterogeneity within LPS between different genera.

Topic: Antimicrobial treatment

## P0155

### The evaluation of a biodegradable periodontal chip containing *Salvadora Persica* (Miswak) in chitosan base as a target drug delivery in the management of chronic periodontitis

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**Aim:** Objective: In the present study, a biodegradable dental chip of chitosan containing Miswak was evaluated as a targeted drug delivery system in patients of chronic periodontitis.

**Material and Methods:** Miswak sticks were grinded into nano particles. The powder was extracted with ethanol. Miswak incorporated Biodegradable Chitosan Chip were prepared. 20 patients with chronic periodontitis with at least 10 sites with localized periodontal pocket of  $>5\text{mm}$  were selected. A split mouth randomized study design was carried out. At baseline, the experimental patients received full mouth scaling and root planing followed by placement of a chips. The placebo group received plain chitosan chips, test group received Miswak chitosan chips while conventional scaling and root planing were performed for the control group only. Measurements of plaque, bleeding on probing were recorded at day zero and after 2 months. Probing depth and clinical attachment levels were recorded at day zero and after 2 months using individual acrylic stent.

**Results:** Miswak chip-treated group showed a significantly better improvement than placebo and control groups at the end of 60 days.

**Conclusion:** Miswak chip -containing chitosan drug delivery system may be an adjunct in treating patients with chronic periodontitis.

Topic: Antimicrobial treatment

## P0156

### Plaque control efficacy of 2 home use regimens of manual toothbrush, antiplaque dentifrice and rinse

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**Aim:** To evaluate the plaque control efficacy of 2 home use oral care regimens each comprising a manual toothbrush (MTB), antiplaque toothpaste and rinse

**Material and Methods:** This was a double-blind, randomized, parallel group plaque study, conducted over 2 weeks amongst 45 people. Plaque evaluations were via Digital Plaque Image Analysis (DPIA) on multiple days during baseline and final weeks. Regimen A: dentifrice – a highly bioavailable 0.454% SnF<sub>2</sub> with SHMP/stannous chloride (blend-a-med Pro-Expert Clinic Line Gum Protection); MTB – (Oral-B Pro Expert Clinical ProFlex); rinse – CPC-rinse (Oral-B Pro-Expert Clinic Line Rinse). Regimen B: dentifrice – 0.3% triclosan/copolymer/NaF (1450ppm F, Colgate Total Advanced); MTB (Colgate 360); rinse – CPC-rinse (Colgate Plax Multi-Protection). Baseline plaque was objectively measured using DPIA and used to randomize balanced groups. After 2 weeks regimen use, overnight, post-brushing and daytime plaque area percent coverage on anterior facial surfaces was assessed. Groups were compared statistically using analysis of covariance.

**Results:** Groups were balanced ( $p > 0.91$ ) at Baseline with mean overnight plaque area of 10.6. After 2 weeks, adjusted mean overnight plaque area for Regimen A was 60.0% lower compared to Regimen B, (statistically significant,  $p < 0.0001$ ). Similarly, post-brushing and daytime plaque was significantly lower by 53.5% ( $p = 0.0016$ ) and 62.8% ( $p < 0.0001$ ) for Regimen A relative to Regimen B. There were no adverse events.

**Conclusion:** After 2 weeks, a highly bioavailable 0.454% stannous fluoride dentifrice, CPC-rinse, and manual toothbrush regimen demonstrated significantly less overnight, daytime, and post-brushing plaque relative to a marketed triclosan/copolymer dentifrice with a different CPC-rinse and manual toothbrush regimen.

Topic: Antimicrobial treatment

## P0157

### Use of Propidium monoazide (PMA) for quantification of live and dead cells in multispecies oral biofilms

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**Aim:** Use of propidium monoazide (PMA) in Real Time PCR (qPCR) has allowed us to quantify live and dead cells in microbiological samples. The aim of the present study is to use this methodology to quantify live and dead cells in biofilms composed of oral bacteria *in vitro*.



**Material and Methods:** Both planktonic cultures and biofilms comprising *Streptococcus oralis*, *Fusobacterium nucleatum*, *Aggregatibacter actinomycetemcomitans* and *Porphyromonas gingivalis* were subjected to culture analysis and PMA-Real Time PCR. In addition, treatments with chlorhexidine (CHX) were performed to assess the efficacy of this method as a standard evaluation technique.

**Results:** The method was standardised for the four species in planktonic growth, where reductions in viability of up to 4.97 log cfu/ml were observed. Study of the biofilms through PMA-qPCR, with and without CHX treatment allowed us to quantify the live and dead cells with reductions of 0.41 log cfu/ml in the biofilms that were not treated with CHX and 2.34 log cfu/ml in those that were treated with CHX.

**Conclusion:** Use of PMA-qPCR permits quantification of live and dead cells treated with a mouthrinse, in planktonic cells as well as in monospecies and multispecies biofilms. This is to our knowledge, the first report of such a methodology in oral biofilm evaluation.

## Topic: Control of infection and inflammation

### P0159

#### Implant Maintenance Protocol for the Complex and Full Mouth Reconstructed Patient

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*Fonthill/Canada*

**Aim:** While the advent of implant dentistry has provided the option of a fixed prosthetic solution, the responsibility for maintenance of complex implant dentistry often rests with the patient and the dental hygienist. This paper evaluates an effective implant maintenance protocol that assists the dental hygienist in the task of providing life-long support for the patient and screening for implant failure.

**Material and Methods:** An implant maintenance protocol was developed and has been successfully implemented in a private specialty practice setting for 7 years. A retrospective analysis of consecutive patients with at least 6 implants supporting a fixed prosthesis was performed. Patients were stratified into two groups: those compliant with the proposed maintenance interval, and those deviating from the proposed maintenance interval. Outcome measures included plaque score, bleeding upon provocation, crestal bone loss, suppuration and patient satisfaction.

**Results:** Strict adherence to the implant maintenance protocol prevented peri-implantitis or mucositis for compliant patients. Those deviating from the proposed maintenance program reported similar patient satisfaction from the implant reconstruction, but had higher bone loss, bleeding upon provocation and plaque scores than the compliant group and may predispose the patient to late implant failure.

**Conclusion:** By following the strict protocols of the proposed implant maintenance protocol, patients with complex implant supported reconstructions can be successfully maintained over long periods. Patients who do not adhere to their customized maintenance protocol may be unaware that their complex implant dentistry is at risk of failing, often for similar reasons that led to their original etiology of tooth loss.

## Topic: Control of infection and inflammation

### P0160

#### Abrasion effect of air-flow powders on root surfaces

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*Zurich/Switzerland*

**Aim:** To volumetrically investigate the abrasive effect of two powders on the root surface.

**Material and Methods:** The root surfaces of 21 human premolars were coated with resin caps. The caps had 4 identical holes (diameter 0.8 mm) on the flat root surfaces. The holes' allocation was conducted randomly. The root surfaces corresponding to hole 1-4 were firstly treated as follows: 1. bicarbonate powder (B) for 5 s, 2. B for 10 s, 3. glycine powder (G) for 5 s, 4. G for 10 s. Thereafter, the surfaces were retreated using the same powder (B or G) for another 10 s. Device settings (Cavitron prophyl jet ST) were on maximum power and maximum water. The teeth were scanned using micro-computed tomography ( $\mu$ ct) initially and after every treatment step. After superimposition of the  $\mu$ ct-scans differences in volumes caused by abrasion were calculated. Differences between the powder groups were calculated and tested for significance.

**Results:** The following medians (interquartile ranges) were found: B5s 0.16 mm<sup>3</sup> (0.08), G5s 0 mm<sup>3</sup> (0), B10s 0.27 mm<sup>3</sup> (0.16), G10s 0.02 mm<sup>3</sup> (0.05), B15s 0.33 mm<sup>3</sup> (0.18), G15s 0.02 mm<sup>3</sup> (0.11), B20s 0.41 mm<sup>3</sup> (0.28) and G20s 0.08 mm<sup>3</sup> (0.1). After glycine powdering for 5 s, abrasion was not detectable and hence smaller than 0.01 mm<sup>3</sup>. For each time period, the abrasion caused by glycine was significantly lower compared to bicarbonate. The bicarbonate-caused defects were 5-20 fold larger.

**Conclusion:** To preserve tooth substance, the cleaning of exposed root surfaces with bicarbonate powder cannot be recommended. Less abrasive glycine powder should be used instead.

## Topic: Control of infection and inflammation

### P0161

#### Fluorescence diagnosis of photosensitizer accumulation in dentin

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**Aim:** An alternative to antibiotics and antiseptics is the technique of photodynamic therapy (PDT). PDT advantages could be used in treatment of deep caries lesions. The aim of the study is to investigate photosensitizer penetration depth in dentin.

**Material and Methods:** 60 human molars with occlusional deep caries cavities were prepared for the study. All of samples were divided in three groups, 20 samples each. All of caries lesions were prepared under caries marker control. 1% gel of "Photoditazine" was applied for 5 min. in first group of samples. Second and third groups were pretreated by 25% orthophosphoric acid for 20 sec. The exposure time of photosensitizer was 5 and 15 minutes respectively. Jointly with "Semiconductor Devices" (Russia) we developed an experimental fluorescent diagnostics setup to monitor the permeability of the chlorine E6 photosensitizer in dentin. The installation consists of a monochrome camera with a

small focal length and the peak filter at 670 nm. Each sample was irradiated by 660 nm laser for fluorescence induction. The image is digitized and processed using specially developed software.

**Results:** The highest degree of permeability of the drug was observed in case of using 25% orthophosphoric acid dentin etch and 15 min. exposition of photosensitizer in caries cavity. Total area of fluorescence averaged  $8.4 \pm 1.3 \text{ mm}^2$ . The smallest area of fluorescence was observed in photosensitizer only group (5 min. exposition) -  $1.8 \pm 1.5 \text{ mm}^2$ .

**Conclusion:** 25% orthophosphoric acid can improve permeability by removing smear layer. Prolonged application time of the photosensitizer can also increase the area of fluorescence.

Topic: Control of infection and inflammation

## P0162

### Introduction of the Dental Hygienist in long-term care facility for patients with Alzheimer disease and cognitive impairment

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<sup>1</sup>Pavia/Italy, <sup>2</sup>Milano/Italy

**Aim:** improve oral health condition for patients with Alzheimer disease and cognitive impairment.

**Material and Methods:** A 5 phases protocol was developed 1: insertion of Dental Hygienist in the staff of Alzheimer Department 2: evaluation of oral condition 3: education of nurses and parents 4: creation of a medical record for the oral health evaluation 5: microbiological evaluation of oral plaque

**Results:** Eighty patients involved. OHAT score shows that 92% patients have moderate oral health alterations. Four patients have been examined under microbiological control before and after professional oral care. The isolated m.o. are: Actinomicetes, Nisseria, Haemophilus, Streptococcus. Professional oral care and nurses assistance produced a decreasing of each isolated m.o. from 109 CFU/ml to 106 CFU/ml especially for Nisseria (from 109 CFU/ml to 104 CFU/ml). Nurses and parents filled in a questionnaire declaring to have met several problems to perform daily oral hygiene because of lack of time and poor knowledge of oral care.

**Conclusion:** Patients with Alzheimer Disease and psycho-physical impairment have poor oral hygiene. After professional oral care we reduce pathogen microbiological number in oral cave. Poor nurses support in oral care is due to lack of time and motivation. Periodical meeting with the hygienist should be programme to improve nurses and parents motivation.

Topic: Control of infection and inflammation

## P0164

### Non-surgical anti-infective mechanical therapy for peri-implant disease with a newly developed Air polishing device: a microbiological and clinical study with a 3-month follow-up.

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**Aim:** The objectives of this study were to clinically and microbiologically assess the effects of a newly developed Air polishing device used for anti-infective therapies of peri-implant diseases. AIR N GO® is the first dual purpose air polisher using the most advanced techniques in Computational Fluid Dynamics, ensuring removal of bacterial biofilms and polishing titanium surfaces by glycine-based powder.

**Material and Methods:** Titanium dental implants with peri-implant disease were assigned to one of the following groups: AIR-N-GO (test, n = 15); and mechanical debridement using piezoelectric ultrasonic system with resin cures (control, n = 15). Patients' mean ages for the 2 categories were 59, and 53 years, respectively. Complete peri-implant status were assessed at baseline (BL), immediately after intervention (Th1) and at 3 months (Th2). At these times, microbiological samples were analyzed with a oligonucleotide probe based method. They were hybridized for the *ssrRNA* of *A. actinomycetemcomitans*, *P. gingivalis*, *T. forsythia*, *T. denticola*, and to a universal bacterial probe (total bacterial load).

**Results:** The most frequently detected microorganisms were *T. forsythia* (57%), and *P. gingivalis* (47%). Recovery levels (mean  $\pm$  SD) were  $1 \pm 1$ ,  $1 \pm 2$ , respectively. Moreover, within the study period, the mean CAL ( $\pm$  SE) in the control group decreased from 4.75 (0.07) mm to 3.95 (0.07) mm. Within the AIR-N-GO test group, the reduction was more distinct, falling from 5.02 (0.07) mm to 3.88 (0.08) mm.

**Conclusion:** At 3 months, the anti-infective treatments resulted in a significant improvement in all microbiological and clinical parameters for peri-implant diseases.

Topic: Periodontal regeneration

## P0165

### Minimally invasive antral membrane balloon elevation (MIAMBE) for single tooth implant placement

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**Aim:** A single missing tooth in the posterior atrophic maxillary segment poses a therapeutic challenge. Sinus lift is infrequently performed due to patient barriers (pain, swelling, hematoma, cost and complications) and anatomical restrictions. In many of these cases the practitioner elects to either treat with a 3-unit bridge or avoid any rehabilitation plan in case of a missing second molar. The MIAMBE (minimally invasive antral membrane balloon elevation) technique is a suitable solution for these cases due to the nature of the procedure. Reported is the initial experience with MIAMBE for sinus floor augmentation and implant placement of single upper second premolar or molars.

**Material and Methods:** We report 24 cases in which MIAMBE was employed for single missing tooth (Of these 13 were first molar and 11 were second molar). Procedure success was 100%. No procedure related complications were detected. All 24 patients had implant placement at the same sitting. Implant survival was 100%. Rehabilitation was performed 6-8 months later.

**Results:** We report 24 cases in which MIAMBE was employed for single missing tooth (Of these 13 were first molar and 11 were second molar). Procedure success was 100%. No procedure related complications were detected. All 24 patients had implant placement at the same sitting. Implant survival was 100%. Rehabilitation was performed 6-8 months later.

**Conclusion:** MIAMBE appears to be a simple, highly effective and safe solution for single teeth implant supported restorations of the posterior atrophic maxilla.

Topic: Periodontal regeneration

**P0166**

### **Titanium Prepared Platelet-Rich Fibrin (TPRF): A Third-Generation Platelet Concentrate: A Pilot Study**

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**Aim:** In this pilot study, we developed a new product that we called TPRF (Titanium Prepared Platelet-Rich Fibrin). TPRF method is based on the hypothesis that it could be better, if titanium tube is used instead of glass tube in Chouckrouns PRF (Platelet-Rich Fibrin) method. Platelet activation by titanium provides distinctive characteristics to TPRF. In this study, we aimed to define the structural characteristics of TPRF and compare it with classic PRF.

**Material and Methods:** Blood samples of 10 healthy male volunteers were collected. Blood sample of each volunteer was drawn by syringe and 9 ml were transferred to dry glass tube and 9 ml were transferred to Ti tube. Each clot (PRF or TPRF) was left to release its serum. In each series (dry glass or Ti tubes), clots were left on sterile woven gauze to release their serum slowly. Half of each clot (PRF or TPRF), after sectioning in two parts along its long axis, was processed for SEM evaluation. The other half of each clot (PRF or TPRF), after sectioning (second time) in two parts along its long axis, one part was processed for fluorescence microscopy analysis and the other part was processed for light microscopy analysis.

**Results:** Both PRF and TPRF showed well-organized structure under low power field by hematoxyline and eosine stain. Under higher magnification of same samples, TPRF showed better-organized network with continuous integrity compared to PRF. With the immunofluorescent staining, the fibrin network appeared mature and dense in both PRF and TPRF group. Fibrin seemed thicker and better organized in TPRF. SEM examination showed no difference between two groups in terms of platelet aggregation and presence of leucocytes.

**Conclusion:** This in-vitro pilot study defines TPRF as an autogenous platelet- and leukocyte-rich fibrin product with superior fibrin network. We believe that TPRF will be widely used in the future; however more research on clinical parameters such as resorption time, clinical success and many other aspects of this new product are required.

Topic: Periodontal regeneration

**P0168**

### **Periodontal surgery of impacted canines at the orthodontist service - consideration about 96 impacted canines treated in 2010**

J. Dersot

Paris/France

**Aim:** To describe the various clinical situation of impacted canines and the different surgical techniques to allow the orthodontist to install in the dental arch impacted canines with all the compound of periodontal structures.

**Material and Methods:** 96 consecutive impacted canines among 77 patients treated between january and december 2010 88 maxillary canines, 8 mandibular canines. Sex ratio : M : 55,6% F : 44,4% From 7 years-10 months to 45 years-1 month - Mean age : 15 years-3 months 13 patients with bilateral upper impacted canines

**Results:** Only one canine (upper buccal in a 23 y.o. don't move. All the other canines were orthodontically positioned in the dental arches. Several surgical procedures are described in relation with the position of the impacted canine (superficial or deep impaction, buccal or palatal)

**Conclusion:** A good cooperation between orthodontist and periodontist is mandatory to facilitate the treatment of impacted canine and lead to a normal periodontium around the teeth in their final position

Topic: Periodontal regeneration

**P0169**

### **Early wound healing after regenerative treatment of intrabony defects with enamel matrix derivative. Does the addition of bone replacement graft increase wound healing complications? A randomized controlled multicenter, practice based study**

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**Aim:** Placement of different regenerative materials has an impact on early wound healing and complications of regenerative surgery. The use of bone replacement grafts (BRG) may improve wound stability and increase soft tissue support but may also increase the risk of complications. This study compares the incidence of wound healing complications after surgery with enamel matrix derivative (EMD) with and without the addition of BRG.

**Material and Methods:** 120 deep intrabony defects, in 120 chronic periodontitis patients were randomly treated with papilla preservation flaps either using EMD+BRG (test) or EMD alone (control). At the end of surgery, primary wound closure was assessed. Presence of suppuration, wound dehiscence, recession, exposed BRG granules, edema, hematoma, postoperative pain and patient complaints were assessed after 1, 3 and 5 weeks.

**Results:** Primary wound closure was achieved in all patients at the end of surgery. Wound failure occurred in 30.8% of test and in 7.4% of control subjects at week 1. The difference was significant at 1, 3, and 5 weeks (P<0.01). The frequency of patients free from adverse events was 38.5% and 52.3% at week 1 in test and control group respectively (P<0.05). Independently of the group, patients did not report significant pain or discomfort from the procedure and none of them needed rescue medication above the prescribed 2 postoperative doses.

**Conclusion:** The test group experienced a more difficult healing period. BRG contributes to early wound healing complications. The ongoing trial will report if the addition of BRG to EMD results in significantly better clinical outcomes.

Topic: Periodontal regeneration

**P0170**

### Which biomaterials may promote periodontal regeneration in human angular defects? A systematic review

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**Aim:** To systematically analyse the regenerative effect of the available biomaterials either alone or in various combinations for the treatment of periodontal angular defects as evaluated in human histological studies.

**Material and Methods:** A protocol covered all aspects of the systematic review methodology. The focused question related to the regenerative effect of the available biomaterials either alone or in various combinations for the treatment of periodontal angular defects as evaluated in human histological studies. Literature search was performed in Medline including hand searching. Combinations of searching terms and several criteria were applied for study identification, selection and inclusion. The primary outcome variable was periodontal regeneration after regenerative therapy obtained with the various regenerative materials as demonstrated through histologic/histomorphometric analysis. New periodontal ligament, new cementum and new bone formation as a linear measurement in mm or as a percentage of the instrumented root length were recorded. Data were extracted based on the general characteristics, study characteristics, methodological characteristics and conclusions.

**Results:** Autogenous bone (AB), demineralized freeze dried bone allograft (DFDBA), natural bone mineral (NBM), guided tissue regeneration (GTR) with or without grafts, an enamel matrix derivative (EMD) alone or with grafts, P-15 and recombinant platelet derived growth factor (rh-PDGF-BB), growth and differentiation factor 5 (GDF-5) were shown to result in periodontal regeneration in humans ranging while the use of alloplastic materials did not seem to substantially promote periodontal regeneration.

**Conclusion:** While AB, DFDBA, NBM, GTR, EMD, P-15, rh-PDGF-BB, GDF-5, promoted periodontal regeneration to a varying extent, alloplastic materials showed no to limited effects.

Topic: Biology of Periodontal regeneration

**P0171**

### FEM in establishing force level efficiently remodelling alveolar bone defects

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<sup>1</sup>Wrocław/Poland, <sup>2</sup>Wrocław/Poland

**Aim:** The aim of this study was to determine - using finite elements analysis - the orthodontic force levels repairing bone defects in vivo in periodontally compromised patients.

**Material and Methods:** Experimental model of orthodontic appliance based on realistic measurements with a stereoscopic microscope. Main application was built using APDL. The Initial position of each bracket on the passive archwire was registered, and then a geometrical and discrete model of the appliance was created automatically. Assessment of CBCT dental scans allows evaluation of the range of bracket displacement: from the initial to the final position achieved on the active archwire. Those displacements established terminal conditions in finite element analysis, enabling calculation of orthodontic force levels. Individual design of the tooth with periodontal ligaments and the periodontal defect subsequently loaded with the determined forces allowed simulation of bone remodeling according to Carter's adaptation process. Pinpointed bone density distribution and compared with border values, enabled assessment of the range of regenerative processes.

**Results:** Bone apposition processes took place in the central part of the periodontal defect, in proximity of the alveolar ridge. Increase in either force level as well as the iteration number were directly proportional to the new bone development.

**Conclusion:** Presented method based on numerical simulation, however CBCT scanning individualised the achieved model. It provided evidence proving loaded bone tissue builds new structures and changes the density, mechanical properties. Introduced procedure enables analysis of orthodontic forces loading periodontal tissues, and therefore allows the appliance design favouring bone apposition prevailing bone resorption in periodontally compromised patients.

Topic: Biology of Periodontal regeneration

**P0172**

### Tooth Mobility in Chronic periodontitis Nigerian patients attending the Periodontology Clinic at a Tertiary Hospital.

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Lagos/Nigeria

**Aim:** To determine the prevalence and pattern of tooth mobility among chronic periodontitis patients attending the periodontology clinic.

**Material and Methods:** A prospective study was conducted on chronic periodontitis patients attending the periodontology clinic of the Lagos University Teaching Hospital. An interviewer questionnaire was used to collect data such as socio-demography of patients and oral hygiene practices. The oral hygiene status was determined using the Simplified Oral Hygiene Index. Periodontitis and degree of mobility were assessed using the CPITN and Millers Mobility Index respectively.

**Results:** A total of 214 patients were seen. Seventy five (35%) patients had tooth mobility. Patients with mobility had a significantly higher mean age ( $49.9 \pm 18.1$  years) than those without mobility ( $34.7 \pm 14.4$  years) ( $p < 0.001$ ). The mean OHI-S was significantly higher in patients with mobility ( $2.09 \pm 0.9$ ) than those without mobility ( $1.56 \pm 0.8$ ) ( $p < 0.0003$ ). Most patients with mobility had a CPITN score of 2. The most affected teeth were lower incisors which also had the worst grade



of mobility. Factors associated with tooth mobility were lower education and horizontal technique of brushing ( $p < 0.05$ ).

**Conclusion:** This study revealed that lower incisors were the teeth most affected by mobility, hence should be given more attention during periodontal examination. Proper tooth brushing techniques should be emphasized for effective plaque control to reduce progression of periodontitis and improve the aesthetic function of these teeth.

Topic: Periodontal therapy

**P0173**

### The periodontal cleaner

Z.-. Ram

*Rehovot/Israel*

**Aim:** In this clinical presentation I tried to establish a simple and efficient way to clean and debride the soft tissue walls of the sulcus around implants and teeth.

**Material and Methods:** 5 sorts of tooth-picks, made of different materials were tested. The healing was evaluated using periodontal indexes: bleeding upon probing and sulcular depth. Clinical shrinkage of tissue was evaluated as well.

**Results:** The use of vibrating blunt wooden tooth-pick was shown to exhibit healing superior to the other method tried, in regard to all of the tested parameters (quantitatively and clinically).

**Conclusion:** Electrically vibrating, blunt soft wooden tooth-pick, showed a favorable healing in all the periodontal parameters tested.

Topic: Periodontal therapy

**P0174**

### Essential Lipid Mediators in the Resolution of Chronic Inflammation

J.P. Reeves

*Peterborough/United Kingdom*

**Aim:** The key to treating periodontal disease successfully lies in facilitating the resolution of chronic inflammation, thereby arresting the progression of the disease and associated tissue destruction. Until now the concept of resolution has always been that of a passive phase in the completion of an acute inflammatory response, however, the discovery of a new family of pro resolving lipid mediators termed resolvins, has shown resolution to involve active biochemical pathways that enable inflamed tissues return to homeostasis.

**Material and Methods:** These lipid derived mediators promote both anti-inflammatory and pro-resolving mechanisms, controlling local inflammatory responses and stimulating resolution. These newly discovered mediators are biosynthesised from essential omega-3 polyunsaturated fatty acids (PUFA's) derived exclusively from the diet.

**Results:** The resolvin group of bioactive mediators are synthesised from endogenous omega-3 fatty acids. Resolvins stimulate resolution, limiting further recruitment and infiltration of neutrophils. Along with protectins, resolvins reduce tissue injury, prevent fibrosis and block TNF transcription in the expression of IL-1 $\beta$ . In addition RVE1 reduces neutrophil concentrations in cellular exudate much earlier than spontaneous resolution alone.

**Conclusion:** A substantial body of evidence is emerging revealing the critical role of nutrition on the periodontal tissues to be increasingly more significant. Over recent years the evidence of genetic and nutritional biomechanisms in inflammation with relevance to systemic health, oral health and the health of the periodontal tissues is becoming clear with current research demonstrating the role of nutrition in the modulation of inflammation. Can we now begin to draw together evidence based nutritional protocols for implementation in supportive periodontal therapy.

Topic: Periodontal therapy

**P0175**

### Effective Periodontal Prophylaxis of the Patient with Severe Mucocutaneous Disease.

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*Fonthill/Canada*

**Aim:** Patients with desquamative gingivitis characterized by blistering mucocutaneous lesions are common in the periodontal specialty practice. Management of patients with diseased oral mucous membranes requires a balance of providing a thorough debridement without damaging the fragile tissues in the process. The objective of this study is to evaluate the efficacy of a periodontal prophylaxis algorithm for patients with chronic and severe epithelial desquamation.

**Material and Methods:** We have developed a protocol to provide effective periodontal prophylaxis for patients with vesiculobullous lesions of the gingiva and other oral tissues. Patients with benign mucous membrane pemphigoid, erosive lichen planus, pemphigus vulgaris and other forms of desquamative gingivitis were treated in a private practice setting for at least two years. Outcomes included plaque scores, attachment loss, tooth loss and visual analog pain scales.

**Results:** The protocol included specialized instrumentation, reduced probing forces and a dearth of air-driven instruments and when combined with periodontal support and maintenance appointments, improved plaque score, attachment levels, and improved quality of life for patients was observed. Moreover, specialized disease-specific home care recommendations reduced inflammation and improved plaque scores. Adjunctive long-term therapy using a steroid-based rinse was associated with a decrease in visual analog pain scores.

**Conclusion:** Effective periodontal prophylaxis and management of patients with desquamative gingivitis including vesiculobullous lesions requires specialized approaches that drastically differ from conventional periodontal maintenance.

## Topic: Periodontal therapy

**P0176****The “Assisted Drainage”: A New Method In Periodontal Therapy Which Decreases Allergic And Neurogenic Asthma Biomarkers**

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Surabaya/Indonesia

**Aim:** The “assisted drainage” therapy (ADT) is a new method in periodontal therapy which is consisted of scaling and root planing that is accompanied with subgingival massage. In previous collaborated study that was conducted by dental practitioners and pediatricians, it was able to improve respiratory quality based on forced expiratory volume in one second (FEV1) within minutes. In this study, we investigated the mechanism of action of the assisted drainage therapy in an allergic animal model

**Material and Methods:** Randomized time series control design experimental study was conducted towards 15 groups of Wistar rats. Allergic sensitization had been done with intraperitoneal injections followed by inhalation of ovalbumin (OVA). Several groups was induced with synthetic Porphyromonas gingivalis lipopolysaccharide (PgLPS1435/1450) intrasulcular injection and several groups were subjected to the assisted drainage therapy. Tissue examinations were done with immunohistochemistry for allergic reaction (leukotriene C4 and eosinophilic cationic protein), and neurogenic inflammation (substance P and calcitonin gene-related peptide) biomarkers in gingival and extrapulmonary bronchus samples. Data were analyses using ANOVA

**Results:** Allergic reaction and neurogenic inflammation biomarkers were increased after PgLPS1435/1450 intra sulcular injection. The assisted drainage therapy significantly decreased allergic and neurogenic inflammation biomarkers ( $p = .001$ ) within minutes

**Conclusion:** The assisted drainage therapy was able to decrease significantly allergic reaction and neurogenic inflammation biomarkers in allergic rats within minutes; therefore, it could be proposed as an alternative therapy of allergic asthma. However, further collaborated studies were required

## Topic: Periodontal therapy

**P0177****Periodontal Disease treated with Low Level Laser Therapy**

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<sup>1</sup>New York/United States of America, <sup>2</sup>Bucharest/Romania

**Aim:** I come before you with the results long standing research in low level laser therapy (LLLT) pursued passionately over the course of my career. 17 years ago as a student in Dental School, my teacher, Dr. Agafita Lefter put this instrument in my hand to apply in the treatment of periodontal disease. The experience drew me into what continues to be the most fascinating adventure of my professional life, the world of LLLT.

**Material and Methods:** We recruited approximately 200 patients

(diagnosed with either diabetis, osteoporosis, hepatic disorder or local factors healthy subjects) evidencing marginally advanced chronic periodontitis. A correct diagnosis was assessed based upon the medical and dental history. All of these patients received classic modern treatment. We treated them with classical procedures of periodontal disease and with laser therapy

**Results:** The subjects receiving LLLT in addition to traditional treatment enjoyed markedly better recovery and healing than subjects treated without LLLT. LLLT results in shorter pain recovery time, bleeding and reduced post surgery complications (edema, inflammation, infection) faster formation and maintenance of the mastication functions.

**Conclusion:** All participating subjects benefits from the classic modern and complete dental treatment of their periodontal disease. Patients treated in addition with LLLT further benefited from improved healing times, less pain, less bleeding, less post surgery complications such as edema, inflammation, and infection compared with the classic treatment only group.

## Topic: Periodontal therapy

**P0178****The effect of oral versus online oral hygiene instruction on the Silness and Loë Plaque and Gingivitis Index after initial periodontal therapy - a pilot study.**

E. Thevissen, W. Verhoef, H. De Bruyn

Gent/Belgium

**Aim:** A RCT was conducted to examine if self-learning via the internet has a beneficial effect on patients' compliance and plaque and gingivitis scores compared to chairside oral hygiene instructions (OHI).

**Material and Methods:** Adult, healthy, non-smoking and previously periodontally untreated patients were included and assigned to either the control or the study group. Having access to internet was another mandatory criterium. At T0 patients' knowledge about oral health and compliance was assessed using questionnaires. After initial periodontal therapy the test group consulted the website for OHI. The control group was instructed orally. PI and GI were reassessed one month later (T1) and the questionnaire repeated.

**Results:** 15 patients participated (7 test and 8 control), mean age 46,7y. At T0 both groups were statistically equal. The basic knowledge on oral health significantly increased in both groups but the test group scored significantly better ( $45,24\% \pm 4,46$  (CI 34,33-56,15)) than the control group ( $28,91\% \pm 4,46$  (CI 18,36-39,46)). At T1 the questions on compliance were responded significantly better in the test group. Plaque scores of both groups improved at all sites. At T1 the mean total and interproximal plaque scores were significantly lower in the test group. On the buccal and lingual aspect no statistically significant differences were detected. At T1 the GI significantly improved for both groups (mean GI <25%) without significant differences at tooth level.

**Conclusion:** The IHCA supplying patients with oral hygiene instructions and a query on oral health is shown an effective tool to improve plaque scores and patient compliance after initial periodontal therapy.

Topic: Periodontal therapy

## P0179

### Success and failure of periodontal therapy during supportive periodontal care

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Dubai/United Arab Emirates

**Aim:** Periodontal therapy properly performed can accomplish the following goals: eliminate periodontal inflammation, reduce Pocket depth and tooth mobility, restore the attachment apparatus, and reestablish the physiological gingival contour to facilitate oral hygiene. Conventional Periodontal therapy generally consists of OHI, basic initial therapy, surgical phase and the supportive periodontal care (SPC). Dental implants are used to replace missing teeth due to periodontal involvement with poor prognosis, or due to non restorability.

**Material and Methods:** Clinical cases treated in government dental services and followed for more than 7 years will be presented. These cases were diagnosed as moderate to severe periodontitis, treated by conventional periodontal therapy and restored by fixed partial dentures or implant supported restorations.

**Results:** Biological and mechanical complications occurred during the supportive periodontal care:

**Conclusion:** Our observations show: - The superiority of periodontal therapy compared To implant therapy on grafted sites. - The complications are due to recurrent caries or due to mechanical failure on abutment teeth. - Furcation involved teeth can be maintained with good patient compliance. - Stable peri implant tissue (non grafted site) in well controlled and treated periodontitis.

Topic: Periodontal therapy

## P0180

### The need for re-treatment in periodontal maintenance patients who had previously undergone pocket reduction flap and osseous surgery.

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<sup>1</sup>Sant Cugat Del Valles/Spain, <sup>2</sup>Barcelona/Spain

**Aim:** When pocket elimination has been done and periodontal stability has been achieved, patients are placed on maintenance therapy (MT), also known as Supportive Periodontal Care (SPC). The question of re-treatment of periodontal disease is rarely alluded to in the literature, and it is not clear why it has not been a focus of clinical research. The aim of this study is to quantify the type and extent of additional periodontal treatment for patients who had previous pocket reduction periodontal surgery, and have been on MT for a minimum period of 12 months.

**Material and Methods:** Patients received periodontal treatment including pocket reduction osseous surgery with an apically positioned flap. Periodontal residents at Universitat Internacional de Catalunya performed the surgeries. After active periodontal therapy, patients were re-evaluated 2 months post-surgery. No pockets were found (>5mm) and patients were placed on SPC (3-4 months). Non-compliant patients are defined when they

attend in less than 75% of their maintenance appointments within 1 year. Re-treatment is judged necessary when deep pockets (>5mm) are identified, presenting with bleeding on probing. For this study, patients are recalled randomly for a re-evaluation of periodontal conditions. A complete periodontal chart is completed and each patient fills a questionnaire evaluating MT perception.

**Results:** 73 % of patients showed recurrence of periodontal disease. Smokers who were non-compliant with SPC showed 95% recurrence rate.

**Conclusion:** Preliminary data suggests a need for re-treatment higher than 70% due to recurrence of periodontal disease in non-complying patients with SPC. Smokers showed a higher recurrence rate of periodontal disease.

Topic: Periodontal therapy

## P0181

### Evaluation of the effects of different desensitizing procedures on dentine tubules: an in vitro study.

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Istanbul/Turkey

**Aim:** The aim of this study was to evaluate the in vitro effects of Er:YAG laser and an in-office desensitizing paste alone or in combination by using SEM analysis.

**Material and Methods:** Forty dentine specimens obtained from freshly extracted impacted 3rd molars were included in this study and divided into 4 groups. Group I served as the control whereas group II, group III, and group IV received Er:YAG laser (30 Hz, 60 mJ/pulse, 10 sec), a desensitizing paste (DP) containing 8% arginine and calcium carbonate, DP+Er:YAG laser combination respectively. All the samples were evaluated under SEM.

**Results:** SEM analysis presented occlusion and narrowing of dentinal tubules in all treatment groups, but more pronounced occlusion was observed in combined treatment group. Intergroup comparisons regarding the tubule diameters, the number of the open dentinal tubules and tubule numbers/100 µm<sup>2</sup> revealed statistically significant difference between the groups in favour of combined group ( $p < 0.05$ ). The difference between single effects of Er:YAG and DP in all parameters were found statistically insignificant.

**Conclusion:** The present study has shown that all treatment procedures are effective in occluding dentinal tubules. On the other hand, more evident occlusion is observed in the combined treatment.

Topic: Periodontal therapy

## P0182

### Curcumin Ameliorates the Evolutional Alveolar Bone Changes in Ligature-Induced Periodontitis in Rats

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**Aim:** Curcumin, 1,6-heptadiene-3,5-dione-1,7-bis(4-hydroxy-3-methoxyphenyl)-(1E,6E) has been used as a dietary spice and a traditional medicine. Its wide range of biological activities, including antioxidant, anti-microbial, anti-inflammatory has been documented exponentially over recent years. However, limited studies evaluate the effects of curcumin on periodontal tissue during the progression of periodontal disease. Therefore, in the present study, we investigated the therapeutic effects of curcumin on the alveolar bone destruction by experimental-induced periodontitis model in rats.

**Material and Methods:** Male Sprague-Dawley rats (5–6 weeks old) were divided into three groups: 1) animals without ligature placement (control); 2) animals with ligature; 3) animals with ligature receiving administration with curcumin (30 mg/kg/day). Rats were sacrificed 3, 7, 10, or 14 days after ligature placement, and the morphology around the tooth and alveolar bone in all dimensions, as well as the relationships among these areas were observed by using microcomputerized tomograph. For histological analysis, alveolar crest bone level, attachment loss, connective tissue (CT) attachment, infiltrated connective tissue (ICT) area were observed between maxillary intermolar area.

**Results:** Rats with ligature showed progressive alveolar bone loss, whereas curcumin treatment significantly ameliorated ligature-induced bone loss on interradicular region of ligature-operated molar. Histometric analysis demonstrated significantly more coronal alveolar crest bone levels, less inflammatory cell-infiltrated connective tissue areas and less connective tissue attachments in the curcumin treated group.

**Conclusion:** Our results demonstrate that curcumin ameliorates the evolutionary alveolar bone loss in a rat model of ligature-induced periodontitis, indicating curcumin may play a crucial role in the pathogenesis of periodontitis, thereby foster its therapeutic application in periodontal therapy.

Topic: Periodontal therapy

## P0183

### Adjunctive effects of systemic antimicrobial therapy to One-Stage Full-Mouth Disinfection in generalized aggressive periodontitis. A placebo-controlled study.

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Turin/Italy

**Aim:** Adjunctive systemic antibiotics may benefit generalized aggressive periodontitis patients (G-AgP) during non-surgical therapy. The aim of this study was to analyze adjunctive clinical and microbiological effects of systemic amoxicillin-metronidazole administration in the One-Stage Full-Mouth Disinfection (OSFMD) protocol.

**Material and Methods:** Thirty-nine subjects with G-AgP were consecutively included in this randomized, double blind, placebo-controlled, 12-month trial. All patients received the OSFMD and were prescribed to take amoxicillin-metronidazole combination (test group, n=19) or placebo (control group, n=20) 3 times a day for 7 days. Subgingival plaque samples were obtained from moderate (4–5 mm) and deep (>6 mm) pocket sites and clinical parameters were recorded at baseline, 6 and 12 months post-treatment.

**Results:** Both therapies led to a statistically significant decrease

in clinical and microbiological parameters compared to baseline ( $p < 0.001$ ). The administration of systemic antimicrobials enhanced the efficacy of OSFMD in reducing probing depth, improving clinical attachment level, and in decreasing the prevalence of *Aggregatibacter actinomycetemcomitans*, *Treponema denticola*, and *Tannerella forsythia* especially in deep pocket sites compared to the placebo group ( $p < 0.05$ ).

**Conclusion:** The overall trend in the data support the administration of metronidazole and amoxicillin as an adjunct to OSFMD therapy in the treatment of G-AgP patients.

Topic: Periodontal therapy

## P0184

### Attachment of collagen I fibers to various surfaces of titanium implants

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<sup>1</sup>Plzen/Czech Republic, <sup>2</sup>Prague/Czech Republic

**Aim:** Synthesis of collagen is one of key determinants of osseointegration. Mostly the cell activities of fibroblasts and osteoblasts were studied. But the attachment unit is collagen, which is primarily responsible for the quality of bonds. The aim of this study was to evaluate bond patterns of reconstituted fibrils of collagen I to various modifications of titanium implants.

**Material and Methods:** Surfaces of standardized titanium cylinders were modified as follows: 1: machined surface, sandblasted and acid etched 2: machined surface, soaked in lye 3: machined surface 4: machined surface, sandblasted, acid etched, soaked in lye. Soluble collagen R was diluted and activated by phosphate buffer. Titanium samples were placed into collagenogenic assay and incubated by 37°C for 48 hours. After incubation were collagen fibers and their contact with surfaces observed by optical microscope and SEM.

**Results:** In sample 1 was formed a continual layer of fixed fibrils covering the whole surface. In sample 2 were visible separated clusters of fibrils only, without a tight contact with titanium surface. Sample 3 revealed sporadic loose clusters of fibrils and absence their attachment. For sample 4 was typical a homogenous and fixed layer of collagen fibers. Attachment of collagen fibrils was in detail evaluated in samples 1 and 4 by SEM. Very sophisticated architecture of fibrils fulfilling the jagged surface of titanium was visible dominantly in sample 4.

**Conclusion:** The present experimental study documented that the implant surface

topography is dominantly important for formation and attachment of collagen fibrils on the surface of implants without participation of cellular mechanisms.

Topic: Periodontal therapy

## P0185

### Dimensional alterations of extraction site after different socket preservation techniques – a volumetric study

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**Aim:** The aim of the following clinical trial was to evaluate the contour changes after different socket preservation techniques in the horizontal dimension.

**Material and Methods:** Thirty patients needing tooth extraction were included. The patients were randomly assigned to one of the following treatments: Tx1: Extraction socket filled with xenogenic bone substitute (mp3-OsteoBioLÖ) and covered with a free gingival graft harvested from the palate. Tx 2: A free gingival graft from the palate was sutured to cover the socket. Tx 3: Extraction socket filled with bone substitute Tx 4: Extraction socket with the blood clot only Polyether impressions were obtained at baseline and at 4 months after surgery. The casts were scanned, matched and evaluated with digital image analysis and volumetric alterations were assessed.

**Results:** All groups displayed contour shrinkage at the buccal aspect. Four months following extraction the mean horizontal loss for Tx1 group was  $-0,79 \pm 0,53\text{mm}$  and for Tx2 group was  $-0,85 \pm 0,57\text{mm}$ . The Tx3 group demonstrated  $-1,45 \pm 0,66\text{mm}$  of mean horizontal loss. The value of Tx4 group was  $-2,26 \pm 1,11\text{mm}$ . There was a statistically significant differences between the groups Tx1 or Tx2 and the control Tx4.

**Conclusion:** Within the limits of this study, it appears that the closure of the extraction socket with a free gingival graft in combination with or without the incorporation of a xenogenic bone substitute in the extraction socket has the potential to limit the buccal soft tissue contour changes after tooth extraction.

Topic: Clinical periodontal regeneration

P0186

### Present New Suture able and Biodegradable synthetic Membrane for GBR

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1532423/Iran

**Aim:** Introduction: Based on positive clinical results of regeneration in Periodontology research in the 1980s, research began to focus on the potential for re-building alveolar bone defects using guided bone regeneration. The theory of Guided tissue regeneration has been challenged in dentistry. Many of Membranes have problems for example rapture or not stability. In this study use new Polymeric synthetic suture able and biodegradable membrane in patient with bifurcation involvement and around the implant with dehiscence.

**Material and Methods:** Method In this study we have two groups patients (30 group one-45 group two) group 1: with Bifurcation involvement (type 3=Through & through ) Group2: patient that after preparation the sit for implant fixture will have dehiscence In this study compare Bioguide Membrane with new Membrane, in this study bone substitute was Allograft (ITB). The Patients have after one ,two weeks follow up and 1, 2 and 3 months with photo -Periodontal Probe and RVG(defragment technique)

**Results:** For photo result we used nonparametric (related samples)-for Probe deep compare means (paired samples T Test ) and for defragment RVG compare means (independent T Test).P value was less of 0.001

**Conclusion:** Conclusion In this study we found three effect compare to Bio Guide consist: The new membranes were user friendly and The new Membrane compare to the Bio guide have

good attachment to bone substitute and Coverage the around the implants and bifurcations very good and in defragment RVG

Topic: Clinical periodontal regeneration

P0187

### Connective tissue surgery procedure in therapy of "Gummy smile"

M. Nedic<sup>1</sup>, D. Lalic<sup>2</sup>

<sup>1</sup>Pancevo/Serbia, <sup>2</sup>Belgrade/Serbia

**Aim:** To verify clinical effects of surgical procedures in solving hipermobile lips problems.

**Material and Methods:** Study included 15 people, of average age 45.2 years, with Gummy smile mucogingival anomaly. The condition for selection of patients was the absence of systemic, autoimmune diseases, smokers, imunokompromised patients. Gingival tissue health assessment was performed by Sillness Löw plaque index, bleeding index and gingival inflammation by Löw-Sillnes, with specific measurements of line of smile and width of attached gum (new division - Lalic, Nedic)

**Results:** The postoperative course was uneventful in all of the patients. There was a reduction of the gingival exposure in all patients with an aesthetic improvement of the smile. The mean gingival exposure before the surgery was  $6.20 \pm 1.87\text{ mm}$  and six months after the surgery  $1.92 \pm 1.76\text{ mm}$ . The mean gingival exposure reduction was  $4.28 \pm 1.25\text{ mm}$ .

**Conclusion:** Application of this therapeutic procedure can be used as a method in solving this mucogingival problem.

Topic: Clinical periodontal regeneration

P0188

### Clinical effect of guided tissue regeneration and connective tissue autotransplants with periosteum in the management of gingival recession

B. Jovicic

Belgrade/Serbia

**Aim:** Gingival recession progression in clinical practice as an ethiological factor of periodontal diseases, and symptoms of the disease have caused the development of various surgical procedures and techniques of the reconstruction of periodontal defects. The aim of this studv was to verify efficacy of surgical procedures that include connective tissue autotransplants with periosteum and guided tissue regeneration for the treatment of gingival recession

**Material and Methods:** The study included 20 teeth with gingival recession, Miiller class II and III. Ten teeth with gingival recession were treated with resorptive membrane and coronary guided surgical flap (GTR group). On the contralateral side 10 teeth with gingival recession were treated with connective tissue autotransplants with periosteum in combination with coronary guided surgical flap (TVT group). We measured the degree of epithelial attachment (DEA), width of subgingival curettage (WGC) and vertical deepness of recession (VDR).

**Results:** The study revealed statistical significance in reducing VDR by both used treatments. Root deepness in GTR and TVT group was 63.5%, and 90%, respectively. With both surgical techniques we achieved coronary dislocation of the epithelial attachment, larger zone of gingival curettage, and better oral hygiene

**Conclusion:** Current surgical techniques are effective in the regeneration of deep periodontal spaces and the treatment of gingival recession. Significantly better results were achieved with the used coronary guided surgical flap dian with guided tissue regeneration

Topic: Clinical periodontal regeneration

**P0189**

### Intellectual system of modern $\beta$ -TCP materials & its role in periodontal surgery

T.N. Modina

*Moscow/Russian Federation*

**Aim:** Periodontal surgery plays an important role in the complex treatment of patients with inflammatory and destructive diseases of the periodontium. Its main goal is the elimination of bone defects using different osteoplastic materials of biological and synthetic origin.

**Material and Methods:** Longstanding scientific and practical experience with CERASORB® in the clinics of Moscow, Berdsk, Kaliningrad, Kazan, Surgut and the others cities of Russia.

**Results:** This leads to the reconstruction of morphologic and functional activity of the periodontium and salvaging teeth.

**Conclusion:** The innovative development of the material knowledge, based on the main laws of the bionics, conduces to the creation of artificial calcium phosphate materials with desired intellectual properties, similar to the nature model of the "ideal information system". Longstanding scientific and practical experience with CERASORB® gives grounds to its consideration as one of the materials having the intellectual and informative qualities ("life crystals") that are capable of precipitating the bone regeneration processes.

Topic: Clinical periodontal regeneration

**P0190**

### The influence of different antiseptics upon the platelet activity in patients with periodontitis treated by autologous PRP transplantation

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*Saint-Petersburg/Russian Federation*

**Aim:** The aim of this study was to establish and assess the influence of local antiseptics and anti-inflammatory drugs on the functional activity of autologous platelet-rich plasma, used in surgical interventions on periodontal and oral soft tissues in the early and late postoperative period.

**Material and Methods:** We have carried out 60 periodontal

operations using PRP. All patients were divided into 3 groups of 20 patients, depending on the used personal hygiene (chlorhexidine bigluconate 0.05%, "Metrogyl", "Vesna Plus" balm).

Examination of patients was performed before surgery, on the 1st, 7th, 10th day after surgery, at 1, 3 and 6 months, oral hygiene and periodontal indices including PMA index, sulcus bleeding index were assessed. The functional activity of periodontal vessels was investigated by ultrasound Doppler device.

**Results:** The oral health improved in all groups including reduction of hygiene and periodontal indices. The vascular functional activity investigation revealed no statistically significant difference between three groups of patients that was confirmed by clinical and laboratory analysis of platelet activity in presence of this antiseptics and anti-inflammatory drugs.

**Conclusion:** In the comparative evaluation of drugs in patients who used the balm "Vesna Plus" healing effect was greater and lasted 6 months after surgery. Thus, objective methods of clinical observation, and functional investigation has shown that the use of antiseptics chlorhexidine bigluconate 0.05%, "Metrogyl" balm "Vesna Plus" in the postoperative period did not significantly affect the regenerative effect of PRP use.

Topic: Clinical periodontal regeneration

**P0191**

### Can Extra-Short implants be used to treat severely atrophied residual ridges?

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*Vitoria/Spain*

**Aim:** The major limitation for oral rehabilitation with dental implants is the presence of insufficient bone volume to provide primary stability to implants fixtures. As the complexity of the surgical technique to compensate the lost alveolar bone increases, patients are exposed to more surgical burden and patient affordability is less permissive. This paper presents the surgical and prosthetic considerations to use Extra-Short implants and evaluate their clinical functionality.

**Material and Methods:** Patients with atrophied residual ridges that impede the insertion of 8.5 mm long implants in which BTI® Extra-Short implants (5.5 mm and 6.5 mm in length) were inserted, and with at least 12 months of follow-up were included in this retrospective study. Implants beds were prepared using low-speed drilling procedure without irrigation.

**Results:** 206 Extra-Short implants (55 implants are 5.5mm long) were inserted in 134 patients between May 2007 and September 2010. Patients median age was  $57 \pm 10$  years and only 18 patients smoke 10 or more cigarettes per day. Females represented 63.4% of the patients. Seventy nine implants were placed in the maxilla and 127 implants in the mandible. One stage surgical technique was employed to place 13 implants. Extra-short implants splitting to neighbor implants was considered in the fixed prosthesis design. Implant-based survival rate was 97.6% whereas patients-based survival rate was 96.3%. Only five implants placed in five patients failed at the end of the follow-up period.

**Conclusion:** Following an adequate surgical and prosthetic procedures Extra-Short implants are reliable alternative to rehabilitate severely atrophied residual ridges.

Topic: Clinical Tips and cases: Regeneration

## P0192

### sinus lifting using press dowell technique with autogenous bone.

H.R. Arab

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**Aim:** The aim of this study, we utilized "press fit dowel bone" method using autogenous bone blocks to increase the thickness of sinus floor bone.

**Material and Methods:** This study was performed in 2010 in the investigation center of Mashhad dental school (Mashhad, Iran). 10 patients, 2 male and 8 female, were selected. The mean age was 39.1 yrs. (SD=7.53 yrs.). 3 of the patients were smoker and 7 were not. The crestal bone was penetrated in one or two points, using a no.4 trephine drill, just two mm short of sinus bony floor. The trphined bony cylinder was pushed into the sinus, using proper osteotom, in such a way that the coronal part of the cut cylinder remains inside the cut cavity. Donor site was mandibular ramous. This bone block was placed in the host site and pushed to place. After 4 month, another CBCT radiograph was taken to measure the increase in the thickness of the bone.

**Results:** The mean thickness of sinus floor bone after the surgery was 8.33mm (SD = 1.39 mm). The mean increase in bone thickness was 3.47 mm (SD=1.4 mm). So there has been a significant increase in bony floor of maxillary sinus (p value = 0.041). There was no significant relationship between bone increase and age, gender, or smoking habits.

**Conclusion:** Sinus lifting by trephine drill and autogenous bone grafting is a simple and practical method for reducing the needed time for implant placement in patients with moderate bone resorbtion in maxillary posterior region.

Topic: Clinical Tips and cases: Regeneration

## P0193

### Porous titanium granules for management of a severe intra bony defect

G. Gholami, M. Kadhodazadeh

360/iran

**Aim:** Bone defects around mandibular incisors have been considered as complicated clinical situations. Loss of one incisor would result in difficulty consequences like as extraction of all mandibular incisors and need to reconstruction of anterior segment with dental implants. There are different kinds of biomaterials to manage these defects. Porous titanium granules (PTG) as the one of the most recent bone substitutes presented not only for treating of periimplantitis but also for management of intrabony defects around natural teeth.

**Material and Methods:** A 45 years old female with an initial probing depth up to 10mm, severe bone loss and grade III mobility of mandibular incisors referred to clinic. It was recommended to extract all involved incisors and replace with dental implants. The patient insisted on maintaining the natural teeth. Different Possible treatment protocols discussed with patient. After flap reflection and complete debridement, the defect filled with

PTG and covered with primary closure. Occlusal adjustment every 6 months and supra gingival prophylaxis every 2 months performed.

**Results:** Non resorbable particles of titanium granules remained stable during healing phase. Early clinical follow up recalls represented that significant healing occurred with healthy 2mm probing depth and grade I mobility. There was no discomfort during function. So, we did not recommend any kind of splinting in this case. Radiographic and clinical parameters showed a stable condition up to two years follow up.

**Conclusion:** Non resorbable porous titanium granules may be considered as a proper material for management of intrabony defects around natural teeth

Topic: Clinical Tips and cases: Regeneration

## P0194

### Comparison of EMD to EMD/Decalcified freezed dried bone allograft in the treatment of human intrabony periodontal defects: A controlled clinical trial with 6 month re-entry

N. Abolfazli, F. Saleh Saber

Tabriz/iran

**Aim:** The aim of this study was to compare the enamel matrix derivative (EMD) alone to EMD combined with a decalcified freezed dried bone allograft (EMD/DFDBA) in the treatment of human intrabony defects

**Material and Methods:** Using a randomized split-mouth design, 12 paired intrabony defects were surgically treated either with EMD (EMD group) or EMD+DFDBA (EMD/DFDBA group). Reentries were performed 6 months after initial surgery. A wilcoxon signed-rank test and Mann -whitney U test were used to compare inter and intra group changes (respectively) in probing depth (PD), clinical attachment level (CAL), gingival recession (GR), bony defect fill, and crestal resorption between baseline and 6 months

**Results:** Both treatment procedures resulted in significant changes in all clinical parameters ( $p < 0.05$ ). Surgical re-entry of the defects revealed a significantly greater amount of crestal resorption and defect resolution in the EMD/DFDBA sites.

**Conclusion:** Both modalities led to significant improvement in the outcome variables assessed. It seems that the addition of DFDBA to EMD did not result in more improvement in clinical parameters.

Topic: Clinical Tips and cases: Regeneration

## P0195

### Combined Use of Platelet-Rich Plasma and Bovine-Derived Xenograft in Treatment of Posterior Interproximal Intrabony Defects

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<sup>1</sup>Istanbul/Turkey, <sup>2</sup>Cambridge/United States of America

**Aim:** The aim of this randomized, controlled clinical trial was to test the efficacy of platelet-rich plasma (PRP) on bovine-derived xenograft (BDX) induced healing in the treatment of posterior interproximal intrabony defects.

**Material and Methods:** Posterior interproximal intrabony defects (n=18) in systemically healthy patients diagnosed with chronic periodontitis (11 females, 7 males) were treated with PRP + BDX or BDX alone. The defects were randomly distributed in study groups and clinical parameters were evaluated at baseline and 6 months after the treatment. The inclusion criteria included 2-3-walled defects with at least 6 mm pocket depth and 3 mm infrabony component with no furcation involvements. Plaque index (PI), gingival index (GI), relative gingival margin level (RGML), probing depth (PD), relative attachment level (RAL), relative transgingival measurement level (RTML), and radiographic bone level (RBL) were measured.

**Results:** Mean decrease in PD was  $4.00 \pm 0.66$  mm in the PRP+BDX group, and  $4.16 \pm 0.96$  mm in the BDX group. AL gain was  $3.88 \pm 0.78$  mm, and  $3.77 \pm 0.66$  mm, respectively. Clinical hard tissue fill (new bone formation) was  $3.83 \pm 0.90$  mm versus  $3.61 \pm 0.85$  mm while radiographic hard tissue fill was  $4.22 \pm 0.66$  mm<sup>2</sup>, and  $3.88 \pm 1.08$  mm<sup>2</sup>, respectively. Both treatment modalities resulted in significant changes in all soft and hard tissue measurements compared to baseline ( $p < 0.05$ ). There were no statistically significant differences between the two groups ( $p > 0.05$ ).

**Conclusion:** The addition of PRP to BDX did not significantly enhance the treatment outcome in posterior intrabony defects.

Topic: Clinical Tips and cases: Regeneration

## P0196

### The use of enamel matrix derivative in combination with synthetic bone graft in the treatment of periodontitis: a case report

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London/United Kingdom

**Aim:** Periodontal disease leads to gradual loss of tooth supporting tissues. The objective of periodontal therapy is not only the arrestment of the progression of disease but additionally, the reconstruction of lost structures.

Enamel matrix proteins extracted from developing embryonic enamel of porcine origin, create a suitable root surface for selective periodontal cell migration and attachment. Subsequent to formation of new attachment, alveolar bone can also be regenerated due to the osteogenic capacity of restored periodontal ligament. A synthetic bone substitute is osteoconductive, offering structural support for the soft tissues and scaffold for cells and molecules during healing.

**Material and Methods:** A 26 year old Asian male was diagnosed with Generalized Aggressive Periodontitis. Following completion of two courses of non-surgical treatment with adjunctive systemic antibiotics, surgical treatment was performed for maxillary left first premolar (3-wall intrabony defect) and maxillary left first molar (circumferential bony defect). Mucoperiosteal flaps were elevated buccally and palatally, granulation tissue adherent to bone was removed and root surfaces were meticulously cleaned. Subsequently, a mixed regenerative material containing enamel matrix proteins and alloplastic bone substitute, was placed in the

intrabony defects. Flaps were carefully adapted and secured with simple interrupted 4.0 polyglactin sutures.

**Results:** The patient was reviewed at 1, 3 and 6 months. Optimal plaque control was evident and soft tissues healing was excellent. At 12 months clinical and radiographic assessment of the attachment levels will be performed.

**Conclusion:** Enamel matrix derivatives in combination with alloplastic bone substitutes may provide a promising combination for the regeneration of periodontal tissues.

Topic: Clinical Tips and cases: Regeneration

## P0197

### The Role Of Endodontics In The Treatment Of Severe Periodontal Lesions

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**Aim:** The relationship between periodontal and endodontic disease has been a subject of speculation for many years. The effects of pulpal disease on the periodontium is well documented, but reverse process known as retrograde pulpitis is not likely to happen until the periodontal disease has reached a terminal state, that is, when bacterial involvement is present in the apical area. The question remains at which point there is indication for endodontic treatment in the context of periodontal therapy. This case report deals with the role of endodontic therapy in the treatment of severe periodontal lesions.

**Material and Methods:** Patient D.B. was referred to our Department for periodontal therapy. Estimated diagnosis was chronic periodontitis. The most severe lesion was around tooth 31, with extreme mobility and pocket depths of 8 mm labially and orally. Vitality testing showed that tooth 31 was vital. Treatment consisted in initial therapy with immobilisation and subsequent endodontic therapy.

**Results:** The six-month follow-up showed significant formation of new bone. The treatment was finished with regenerative surgical procedure

**Conclusion:** It was shown that adequate endodontic therapy in the context of periodontal therapy, even in vital cases, significantly improves the outcome of periodontal treatment.

Topic: Clinical Tips and cases: Regeneration

## P0198

### Periodontal Regeneration in Degree II Furcation Using Resorbable Membrane and CS-PRP . A case report.

C.W. Cheah

Kuala Lumpur/Malaysia

**Aim:** Introduction A combination of Calcium Sulphate (CS) and Platelet-Rich-Plasma (PRP) has been used to treat bony defects in human and has shown promising results.

**Material and Methods:** Case report A 51 years old Chinese man, diagnosed with generalized chronic periodontitis presented



with Degree II furcation involvement on tooth 46. The initial probing pocket depth was reported to be 11 mm. It is important to take note that teeth with Degree II and III furcation cannot be optimally cleaned by the patient without changing the interradicular anatomy. A combination of resorbable membrane and CS-PRP was used in an attempt to regenerate the periodontal tissue support.

#### **Results:** Discussion

PRP contains at least 1,000,000 platelets/ $\mu$ l in a 5ml volume. It is a rich source of growth factors, among which are platelet-derived growth factors (PDGF aa, PDGF bb and PDGF ab) and transforming growth factors (TGF  $\beta$ 1 and TGF  $\beta$ 2), vascular endothelial growth factors (VEGF) and epithelial growth factors (EGF). Apart from that, there is significant suppression of inflammation via increased secretion of Lipoxin A4, which suppresses the release of cytokines, limits inflammation and promotes tissue regeneration. CS activates the growth factors present in the PRP, and carry and release growth factors in a time-dependent manner.

**Conclusion:** 1 year follow up of tooth 46 was noted to be stable periodontally. Probing pocket depth at the site of regeneration was recorded as 2 mm, with 2 mm gingival recession. There appeared to be a 9 mm attachment gain, from the initial 11 mm probing pocket depth with 2 mm gingival recession.

### Topic: Clinical Tips and cases: Regeneration

#### **P0199**

#### **Isolation and investigation of multipotent human periodontal ligament stem cells.**

Z. Kadkhoda, A. Khoshzaban, R. Malekolkotab  
Tehran/Iran

**Aim:** : culture of human preiodontal mesenchymal stem cells to production osteoblast. This might be used for repair of human periodontal defects in future

**Material and Methods:** Method: periodontal tissues were obtained from periodontium of patients who were candidate for periodontal surgery. They were 25-45 years old and had no systemic diseases, no smoking, and no drug treatment. Tissues were cultured in DMEM medium. Cells were by subsequently expanded by passages. 3 passages were done. Then cells were evaluated by inverted microscope and floctometry. We stained PDLstem cells with these markers: CD44, CD90 CD166,CD13, CD34,CD45

**Results:** PDL stem cells expressed MCSCs markers as shown in floctometry. The cells were negative by CD34 and CD45 markers and were positive by CD90, CD166, CD13, and CD44 markers .We saw a monolayer attached cells on the floor of flask macroscopically and we saw spindle cells by inverted microscope

**Conclusion:** Our findings show that human PDL contains a population of multipotent postnatal stem cells can be isolated and expanded in vitro. It provides a reservoir of stem cells from an accessible tissue resource. These cells have capacity of proliferation ex vivo. Therefore tissue regeneration mediated by human PDL stem cells might have potency of practical cellular-based treatment of periodontal defects.

### Topic: Clinical Tips and cases: Regeneration

#### **P0200**

#### **¿Is it posible to regenerate the buccal bone plate with Emdogain®?**

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Valencia/Spain

**Aim:** The most predictable indication of Emdogain is the regeneration of three walls, narrow and deep bone defects. Currently, there is little literature on the regenerative capacity of the buccal bone plate with this type of material. Being able to regenerate vestibular bone plate can be a major advance, since it offers us new therapeutic ways in teeth with complications of this type (recessions).

**Material and Methods:** A 68 year old male patient non-smoker with no relevant medical history arrives to our clinic with an abscess in the upper right central incisor with no vitality. In the radiographic exploration we observed a periapical area,while in the lateral parallelized radiograph it is observed an absence of vestibular bone plate. After the root canal treatment, apicectomy and guided tissue regeneration with Emdogain is performed.

**Results:** After 9 months of treatment, when we compared lateral parallelized we observed periapical bone fill and regeneration of the buccal bone plate.

**Conclusion:** Despite the limited literature and the controversial results, there is a wide line of research.In fact in our department we started with some clinical cases, obtaining positive results in the first one.

### Topic: Clinical Tips and cases: Regeneration

#### **P0201**

#### **Alveolar preservation using the Ice Cream Cone Technique: A case report**

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**Aim:** The extraction of a tooth leads to the resorption of soft and hard tissue. The preservation of the alveolar bone facilitates posterior placement of implants improving the prosthesis' aesthetic and functional results. Schropp et al. 2003 reported that after 12 months of the tooth extraction, approximately 50% of the alveolar crest width was reduced. Its been demonstrated that, Sockets treated with guided bone regeneration, loose less than 20% of buccal-lingual width.

**Material and Methods:** 40 year old female, without a relevant medical background, presents a fracture of a cast post and core located on the right central incisor tooth. An implant (AVINENT) had been placed previously on the left central incisor tooth due to endodontic failure. The residual root is removed and regeneration is performed using the Ice Cream Cone technique, described by Elian et al 2007. Because of the aesthetic requirements of the area it is important to maintain the integrity of the vestibular cortical And connective tissue. The internal vestibular wall is covered with Bio-Guide collagen

membrane, the socket is filled with xenograft Bio-oss. The connective tissue graft is placed covering the regenerated alveolar socket to prevent the collagen membrane from being exposed

**Results:** Demonstrate how this preservation technique can minimize post extraction bone loss. Present through a clinical case the technical and clinical sequence of crest preservation through the Ice Cream Cone Technique

**Conclusion:** Bone regeneration minimizes the loss of hard and soft tissue facilitating placement of osseointegrated implants. Thanks to this technique we have accomplished better aesthetic results and a minimal loss of crest volume.

Topic: Clinical Research: Diagnosis and risk factors

## P0202

### Smoking Behaviour in Austrian Dental Students

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Vienna/Austria

**Aim:** To assess the smoking status and attitudes towards cessation therapy in Austrian Dental Students in the clinical phase of their education.

**Material and Methods:** A standardized questionnaire was distributed among all dental students of the Bernhard Gottlieb University Dental Clinic Vienna.

**Results:** A total of 197 students answered the questionnaire. 33,5% of the students are smokers. Mean daily cigarette consumption was 8. There was no difference in smoking behaviour between male and female students. Parental behaviour had no influence. More than 60% of all smokers want to quit smoking. 68% of smokers smoke for relaxation and stress management. More than 90% of the students - smokers and non-smokers - know of the interrelationships with other diseases, especially lung and oral cancer. 49% of smokers vs. 80% of non-smokers believe that dentists as role model should not smoke. 80% of all students see it as their duty to enforce smoking cessation programs.

**Conclusion:** Although dental students in Austria receive lectures on the potential health hazards and are very well aware of such, the percentage of smokers among dental students is very high (33,5%) in comparison with other countries (Germany 27%, Belgium 25%, USA 4%, CAN 3%). Main reason for smoking is stress. The majority of the smoking students wants to quit. Even smoking students see it as part of their medical responsibility to enforce smoking cessation in dental patients, but they do not feel they have to serve as a role model. The majority of students feels well prepared to provide sufficient information in their professional future.

Topic: Clinical Research: Diagnosis and risk factors

## P0203

### Total amount of interleukin-1 $\beta$ and interleukin-1 receptor antagonist in periodontitis and healthy patients

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<sup>1</sup>Zabrze/Poland, <sup>2</sup>Bytom/Poland

**Aim:** Regulation of IL-1 $\beta$  is a critical element of immune responses in health and disease. There must be thousand times more IL-1ra (inhibition units of IL-1ra) than IL-1 $\beta$  to suppress the effect of acting of the second cytokine. The aim of this study was to investigate and compare levels of IL-1 $\beta$ , IL-1ra in gingival crevicular fluid samples obtained from periodontitis and healthy patients.

**Material and Methods:** Eighty patients were included into the study. The periodontitis group consisted of 50 patients with chronic periodontitis. The control group consisted of 30 periodontally healthy subjects. Oral Hygiene Index - Simplified, Periodontal Index, Probing Depth, Clinical Attachment Level were measured. GCF was collected using the periopaper strips. The concentrations of interleukins were measured by the ELISA technique.

**Results:** The total amounts of both cytokines were significantly higher in periodontitis group than in the control group (IL-1 $\beta$ : 19.8  $\pm$  1.9 vs. 4.1  $\pm$  0.6 pg/30s, IL-1ra: 7.0  $\pm$  0.9 vs. 4.1  $\pm$  0.5 ng/30s). The levels of each cytokine were reported also as moles, in respect to their molecular mass. There was 800x more moles per sample/30s of IL-1ra than IL-1 $\beta$  in control group and nearly 300x more moles per sample/30s of IL-1ra in periodontitis group.

**Conclusion:** The increased secretion of IL-1ra in periodontitis is not adequate to IL-1 $\beta$  release.

Topic: Clinical Research: Diagnosis and risk factors

## P0204

### Tooth Loss in quitters and continuing smokers

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São Paulo/Brazil

**Aim:** The aim of this study was to evaluate tooth loss in quitters and continuing smokers with chronic periodontal disease who attended a smoking cessation clinic.

**Material and Methods:** Subjects willing to quit smoking enrolled in the service offered at the Smoking Cessation Clinic at the University Hospital in São Paulo, Brazil. They received non-surgical periodontal treatment and concomitant smoking cessation therapy. Periodontal maintenance was performed every 3 months until 12 months of maintenance. A single, calibrated blinded examiner to smoking status conducted full mouth periodontal examination at the baseline, after 3, 6 and 12 months after periodontal treatment. The same examiner verified tooth loss during maintenance program. Within the 12 months the necessity of tooth extraction was discussed by at least three periodontists after clinical and radiographic analysis.

**Results:** Of 201 enrolled patients, 93 met the eligibility criteria and 52 remained in the study for one year. Of these, 17 quit smoking and 35 continued to smoke or oscillated. After one year, the mean tooth loss was of 0.12 ( $\pm$ 0.6) in quitters and 0.51 ( $\pm$  1.0) in continuing smokers ( $p = 0.16$ ). Six quitters lost their teeth (33,3%), while 7 (70%) smokers lost their teeth ( $p = 0.39$ ). Quitters lost 18 teeth and continuing smokers lost 10 teeth.

**Conclusion:** There was no significant difference in tooth loss between subjects who quit smoking compared to those who continued to smoke.

Topic: Clinical Research: Diagnosis and risk factors

## P0205

### The association of oral hygiene and periodontal disease parameters with tobacco use

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<sup>1</sup>Constanta/Romania, <sup>2</sup>Bucharest/Romania

**Aim:** The aim of this study was to determine if an association existed between periodontal disease and tobacco use.

**Material and Methods:** The study design was a cross-sectional study which included 441 subjects selected from patients attending dental clinics of the Faculty of Dental Medicine Constanta during 2010-2011. The charts of patients were examined to determine patient's self-reported systemic condition and smoking history. In addition, maximum probing depth, oral hygiene status was recorded for each patient included in the study. Two trained, non-calibrated dentists recorded the data. Ethical approval was obtained and each patient signed an informed consent. The distributions of the dependent variables expressing the plaque and calculus scores and maximum probing depth for both smokers and non-smokers were analyzed using non-parametric methods- Spearman test, Wilcoxon test. Statistical significance was accepted at  $p < 0.05$ .

**Results:** One-third-36% of subjects are active smokers, 7% are past-smokers and 58% are never-smokers. No statistical significant differences were found between smokers and never-smokers regarding oral hygiene, but plaque accumulation (expressed by plaque index) is correlated with cigarette consumption ( $p=0,0007$ ) and smoking duration expressed in years ( $p=0,0009$ ), as well as calculus depositions (expressed by calculus index) are correlated with daily cigarette consumption ( $p=0,0009$ ) and smoking duration ( $p=0,0007$ ). Former-smokers exhibit higher probing depths  $-4,55 \pm 2,8$  as compared with smokers  $-3,45 \pm 2,6$  and never-smokers  $-3,69 \pm 2,5$ . Long term heavy smoking is associated with higher pocket depths ( $p < 0,0001$ ).

**Conclusion:** Heavy and long-term smoking seemed to be associated with poorer oral hygiene and higher probing depths.

Topic: Clinical Research: Diagnosis and risk factors

## P0206

### Mmp-8 Levels in the Gingival Crevicular Fluid Vary in Dependence of Periodontal Pocket Sample Collection

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**Aim:** MMP-8 is a central enzyme involved in inflammatory tissue remodelling. The aim of the present study was to investigate differences of mmp-8 levels in the gingival crevicular fluid (GCF) between apical and coronal sampling methods.

**Material and Methods:** GCF fluid samples were collected from 16 patients with generalized severe chronic periodontitis

(non-smoker, without other chronic diseases, at the age of 35 to 71) from 77 periodontal pockets of different teeth with two different sampling strategies. Sites were divided into shallow ( $\leq 4$  mm) and deep ( $> 5-8$  mm) periodontal pockets. Gingival crevicular fluid collection strips were moved either 1.5 mm (coronal sampling) or as far as possible (apical sampling) into the periodontal pocket and removed after 30 seconds. Statistical analysis was performed using the Wilcoxon signed-rank test.

**Results:** In deep sites the apical GCF sampling strategy showed statistically significant ( $p < 0,001$ ) higher concentrations of mmp-8 compared to the coronal collection method ( $29.0 \pm 75.1$  versus  $12.5 \pm 33.07$  ng/ml). No significant differences between coronal and apical GCF sampling could be detected at shallow sites.

**Conclusion:** For deep periodontal pockets coronal sampling seems to underestimate periodontal inflammation revealed by mmp-8 levels. In sites up to 4 mm proper placement, either coronal or apical, is less crucial with respect to mmp-8 measures.

Topic: Clinical Research: Diagnosis and risk factors

## P0207

### Periodontitis and Atherosclerosis – an observational study

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Porto/Portugal

**Aim:** A poor oral health has been related with cardiovascular diseases. Specifically, periodontitis has been implicated in the pathogenesis of atherosclerosis.

The aim of this study was to evaluate the relationship between the atherosclerosis degree and the periodontitis severity degree.

**Material and Methods:** Fifty adult patients were selected from those who underwent the cervical eco-Doppler exam (common and/or internal carotids). The patients that fulfilled the inclusion and exclusion criterias were divided into two main groups, after completed the cervical eco-Doppler: Test group,  $IMT \geq 1$ mm and/or with atherome plaque ( $IMT \geq 1.5$  mm); Control group,  $IMT < 1$ mm and no atherome plaque

**Results:** All patients showed periodontitis, albeit with different severity degrees. Patients with slight periodontitis predominantly present absence of atherosclerosis, patients with moderate periodontitis predominantly present an  $IMT \geq 1$ mm, and patients with severe periodontitis showed a predominant formation of atherome plaque. The same trend was present for the stroke patients. And, although all of those had atherosclerosis, the atherome plaque percentage was lower than the percentage of  $IMT \geq 1$ mm.

**Conclusion:** Within the limitations of our study we can suggest an association between periodontitis severity increasing and an increase of IMT, suggesting the periodontal condition as an eventual risk indicator for the atherosclerotic pathology.

Topic: Clinical Research: Diagnosis and risk factors

## P0208

### Periodontal Conditions in a Group of Colombian Type 2 Diabetic Patients with Different Degrees of Metabolic Control

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Bogotá/Colombia

**Aim:** To measure the occurrence of severe chronic periodontitis in a group of Colombian type 2 diabetes patients.

**Material and Methods:** A group of type 2 diabetic patients regularly attending a diabetes program was selected according to specific criteria. Demographic, medical and periodontal variables were registered. A randomized half-mouth examination was performed, including plaque Index, bleeding on probing, pocket depth and clinical attachment level. Comparison to a group of individuals without diabetes was performed based on different criteria; the first was the presence of  $\geq 2$  interproximal sites with CAL  $\geq 6$  mm, and  $\geq 1$  interproximal sites with PD  $\geq 5$  mm; the second was presence of  $\geq 50\%$  percentage of bleeding on probing, and  $\geq 20\%$  sites showing PD  $\geq 4$  mm. The effect of metabolic control was analyzed. Results were tested through Chi-square, Mann-Whitney, Kruskal-Wallis and Pearson correlation tests.

**Results:** Seventy two subjects with type 2 diabetes were compared to 39 subjects without diabetes of a similar age. Diabetic subjects had a fair degree of metabolic control, HbA1c 7.94% (1.60). Occurrence of severe chronic periodontitis was similar for both groups when using diagnostic criteria based on CAL levels, 22.22%, but was greater for subjects with diabetes when using criteria based on periodontal inflammation, 23.07% versus 5.12%. Degree of metabolic control had a relation to periodontal parameters.

**Conclusion:** Colombian type 2 diabetes subjects demonstrated poorer periodontal conditions than non-diabetic individuals

Topic: Clinical Research: Diagnosis and risk factors

## P0209

### Assessment of the periodontal health status in patients undergoing orthodontic treatment with fixed or removable appliances. A microbiological and preliminary clinical study.

G.M. Abbate, F. Migliori, L. Levrini

Varese/Italy

**Aim:** The aim of this study was to evaluate the microbiological and preliminary clinical outcomes occurring during the first three months of orthodontic therapy in adult patients with fixed appliances or the removable Invisalign® System.

**Material and Methods:** Thirty patients were assessed for Plaque Index (PI), Probing Depth (PD), Bleeding on probing (BOP) and Compliance to oral hygiene. Subgingival microbial samples were also analyzed using real-time PCR for periodontal pathogens

identification and microbial biofilm mass. The results were analysed using Chi-square X2, Odds Ratios (OR), Regression analysis (DOE) and ANOVA.

**Results:** A decreased level of PD ( $p=0.002$ ) and BOP ( $p<0.001$ ) was detected in the Invisalign® group after 90 days of treatment. A direct influence of orthodontic treatment on oral hygiene compliance was found in patients treated with Invisalign® and less subgingival biofilm mass. Only one positive sample for periodontopathic anaerobes (*Aggregatibacter Actinomycetemcomitans*) was found in a patient treated with fixed orthodontic appliances after both 30 and 90 days of treatment.

**Conclusion:** In this study, fixed and removable appliances showed no increase in the risk for periodontal disease in patients undergoing orthodontic therapy. However, the orthodontic therapy performed using the removable Invisalign® appliances may facilitate oral hygiene procedures and minimize the negative effects on gingival inflammation.

Topic: Clinical Research: Diagnosis and risk factors

## P0210

### Validation of a dental image analyzer tool to measure the radiographic defect angle of the intrabony defect in periodontitis patients

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**Aim:** A report describing the software Dental Image Analyzer (DIA) was published in 2009. A new function, the measurement of periodontal intrabony defect angle, was added to the software in 2010. The purpose of this study was to investigate whether the measurement of radiographic intrabony defect angle by using digital radiographs and the newly developed DIA tool was comparable to the measurements obtained with the conventional protractor method.

**Material and Methods:** Baseline radiographic defect angle of intrabony defects was measured conventionally in 60 selected teeth from 47 patients by using a protractor and then digitally by using the newly developed DIA tool. Measurements were made independently by 4 experienced dentists. The radiographic defect angle of intrabony defects was measured after the 3 anatomical landmarks, the CEJ, top of the crest and the bottom of the defect were identified.

**Results:** Both methods showed a high interexaminer reliability for measurements of the radiographic defect angle of intrabony defects (ICC > 0.97). Moreover, both the methods showed high reliability (ICC > 0.96). On the other hand, the new DIA tool, compared to the conventional method, exhibited high sensitivity (0.92) and high specificity (0.91) in selecting defects  $\geq 37^\circ$  or  $< 37^\circ$ . Analysis of the time taken for each measurement revealed significant differences between the 2 methods.

**Conclusion:** This study provided evidence for the lack of a significant difference between the conventional method and the DIA tool for radiographic measurement of intrabony defects. However, digital analysis was significantly faster.



Topic: Clinical Research: Diagnosis and risk factors

## P0211

### Salivary levels of IL-1 $\beta$ , IL-17, and IL-23 in localised and generalised periodontitis

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**Aim:** The aim was to examine three interleukins IL-1 $\beta$ , IL-17 and IL-23, and to compare their salivary levels to the severity of periodontitis.

**Material and Methods:** Salivary specimens originated from 230 subjects; 85 of the subjects had advanced periodontitis, 65 subjects had localised periodontitis and 80 controls without periodontitis. Cytokine analyses were done by Luminex technology.

**Results:** Salivary concentrations of IL-17 and IL-23 were higher in the localised periodontitis groups in comparison with controls ( $p < 0.001$ ,  $p = 0.012$ ), but lower in the generalised periodontitis group than in the localised periodontitis groups ( $p < 0.001$ ,  $p = 0.047$ ). There was no difference in salivary IL-1 $\beta$  concentrations between the control and localised periodontitis groups. On the other hand, IL-1 $\beta$  concentrations were significantly higher in the generalised periodontitis group than those in the control and localised periodontitis groups ( $p < 0.001$ ). Salivary concentrations of IL-17 and IL-23 correlated significantly (Spearman's rho: 0.299,  $p = 0.013$ ).

**Conclusion:** Our results suggest that due to differences in their regulations, changes in the levels of salivary IL-1 $\beta$ , IL-17 and IL-23 differ from each other during the progression of periodontitis.

Topic: Clinical Research: Diagnosis and risk factors

## P0212

### Serum levels of long-chain polyunsaturated fatty acids in patients with periodontal disease

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**Aim:** Our aim was to analyze the serum levels of long chain polyunsaturated fatty acid (LC-PUFA) w-3 docosahexaenoic acid (DHA), eicosapentaenoic acid (EPA), and LC-PUFA w-6 arachidonic acid (AA) in chronic periodontitis patients and compare with subjects with gingivitis alone.

**Material and Methods:** Twenty one patients with periodontitis (mean age  $46.00 \pm 8.82$ ) and 16 subjects with gingivitis only (mean age  $31.50 \pm 7.52$ ) were investigated. The clinical examination included Pocket Probing Depth (PPD), Clinical Attachment Level (CAL), Bleeding on Probing (BOP) and plaque index (IP). Blood samples were analyzed the presence of DHA, EPA and AA using gas chromatograph.

**Results:** Periodontitis patients showed significantly higher levels of all LC-PUFAs compared with gingivitis subjects (DHA  $p = 0.007$ , EPA  $p = 0.033$  and AA  $p = 0.001$ ). The ratios AA/EPA and AA/DHA did not differ significantly between groups, but both were over of the recommendation level for cardiovascular disease risk (19.76 and 23.03 mcg/ml, respectively). The PPD and CAL

were positively correlated with n-3 and n-6 LC-PUFAs, except for CAL and EPA.

**Conclusion:** The serum levels of DHA, EPA and AA were higher in periodontitis patients than in gingivitis subjects, which indicate that the severity of periodontal disease might influence the expression of n-3 and n-6 LC-PUFAs but not the ratio.

Topic: Clinical Research: Diagnosis and risk factors

## P0213

### Serum IgG levels to A. actinomycetemcomitans in Brazilian generalized aggressive periodontitis patients.

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Sao Paulo/Brazil

**Aim:** Studies have examined the relationship between the distribution of A. actinomycetemcomitans serotypes and periodontal condition; the prevalence of the A. actinomycetemcomitans serotypes may differ according to the geographical location and type of disease, and serotype c was shown to be highly prevalent in Brazil. The ability to induce disease and a strong immune response may also differ among the serotypes. This study investigated the sera IgG levels to A. actinomycetemcomitans in patients with generalized aggressive periodontitis.

**Material and Methods:** Twenty six subjects presenting aggressive periodontitis, aged 19 to 35 years and three healthy negative controls were evaluated for serum levels of antibodies to A. actinomycetemcomitans serotypes a, b and c by enzyme-linked immunosorbent assay (ELISA). Sera were considered responsive to each serotype when the OD corrected values were  $>$  mean OD healthy + 7sd.

**Results:** Data revealed that IgG levels were positive for A. actinomycetemcomitans in 6 of 12 afro descendant patients. Five of these positive patients had high antibodies titers to serotype b, including 3 responsive also to serotypes a and /or c. However, an immune response to A. actinomycetemcomitans was observed in 12 of 14 Caucasian subjects. Ten of these subjects were immune responsive to serotype b, including 4 sera responding also to serotypes a and/or c. Serum IgG antibody levels were significantly different among different serotypes of A. actinomycetemcomitans of patients with GAP ( $p < 0,01$ ).

**Conclusion:** Response to A. actinomycetemcomitans serotype b was shown to be strongly associated with generalized aggressive periodontitis, especially among Caucasian aggressive periodontitis patients.

Topic: Clinical Research: Diagnosis and risk factors

## P0214

### Periodontal Pathogens Associated with Further Changes in Severity of Periodontal Conditions in Japanese High School Students

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**Aim:** The aim of this study was to evaluate the clinical periodontal condition of high school students during 2 years and to link identified pathogenic microbial markers that could be used for screening of persons with risk for future periodontitis.

**Material and Methods:** We recruited 109 high school students, aged 15 years, and examined their periodontal condition. Probing depth (PD), bleeding on probing (BOP), and subgingival calculus (Ca) were recorded at the mesiobuccal and mesiolingual sites of the four first molars. The students were further divided into 3 groups (risk, healthy, others) according to their clinical parameters. Subgingival plaque samples were collected from the mesiolingual site of the left lower first molar from the risk and healthy groups. Indirect immunofluorescent technique was performed to detect *Porphyromonas gingivalis* (Pg), *Tannerella forsythia* (Tf), *Prevotella intermedia* (Pi), *Campylobacter rectus* (Cr), *Eikenella corrodens* (Ec), *Aggregatibacter actinomycetemcomitans* (Aa) serotype b and serotype c. The relationship between the distribution of these pathogens at baseline and the change of clinical parameters after 2 years was examined statistically.

**Results:** Thirty-eight students were classified into the risk group and 11 students were classified into the healthy group at baseline. The distribution of Tf consistently tended to be higher in the students who remained the risk group or the students whose clinical symptoms became worse during 2 years. However, it remained lower in the constant healthy group or the improved group.

**Conclusion:** The results showed that the significant reference ranges of periodontal pathogens as Tf could be used as valuable markers for predicting further periodontal diseases.

Topic: Clinical Research: Diagnosis and risk factors

P0215

### Evaluation of Serum Anti-cardiolipin Antibody Elevation in Generalized Severe Chronic Periodontitis

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**Aim:** Periodontally infected patients may be at a higher risk of systemic diseases. Evidence shows that infections play a role in etiology of Anti-Phospholipid antibody Syndrome (APLS) via induction of Anti-cardiolipin antibody (ACLA) production. Considering similarities between systemic consequences of periodontitis and APLS, investigation of elevated ACLA level in periodontitis may be helpful in figuring out disease consequences. This study aimed at comparing serum ACLA level between patients with Generalized Advanced Chronic Periodontitis (CP) and periodontally healthy controls.

**Material and Methods:** 57 adult patients with advanced CP and 48 periodontally healthy controls having  $\geq 20$  teeth with no history of systemic diseases, smoking, antibiotic therapy in the past three months and periodontal therapy during past two years were included. Clinical parameters including CAL, PPD, BOP and PI were measured (Test group: with  $\geq 5$  mm attachment loss in more than 30% of sites consistent with local factors). Serum ACLA level was measured using ELISA method with Orgentic Diagnostika kit mbH (Germany). ACLA level more than 20 U/ml was considered positive test according to manufacturer kit. The data were analyzed with t-test and Pearson's correlation.

**Results:** The means of CAL, PPD, BOP and PI in test group were  $4.93 \pm 1.41$  mm,  $5.11 \pm 1.05$  mm,  $49.36 \pm 19.58$  and  $53.09 \pm 18.16$  respectively, while in control group the above measurements were  $0.36 \pm 0.16$  mm,  $2.72 \pm 0.58$  mm,  $4.05 \pm 3.61$  and  $13.03 \pm 3.41$  respectively. The differences between the two groups were significant ( $p=0.000$ ). The mean of serum ACLA level in test group was  $5.15 \pm 2.34$  while in control group it was  $3.56 \pm 1.91$ . The mean difference was significant ( $p=0.002$ ) between the two groups, although no positive test was found. A positive correlation existed between ACLA level and all clinical parameters.

**Conclusion:** Although no one was positive for ACLA test in CP and control groups, the significant increased serum ACLA level in CP group remains to be investigated.

Topic: Clinical Research: Diagnosis and risk factors

P0216

### IL-1 polymorphism and microbial profile in patients with generalized aggressive periodontitis and generalized chronic periodontitis.

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Warsaw/Poland

**Aim:** Assessment of the incidence of selected bacterial pathogens and presence of IL-1 polymorphisms in the patients with generalized forms of aggressive and chronic periodontitis.

**Material and Methods:** Study group consisted of 40 non-smoking, generally healthy individuals (17-aggressive periodontitis, 23-chronic periodontitis). Clinical examination involved marking of commonly used clinical parameters: pocket depth, clinical attachment loss, bleeding and plaque indices. Percentage of pockets deeper than 4 mm was also counted. IL-1 genotype was examined with the use of commercially available tests. In periodontal pockets, with the use of real-time PCR technique, following pathogens were detected: *A. actinomycetemcomitans*, *P. gingivalis*, *T. forsythia*, *T. denticola*, *P. intermedia*, *P. micra*, *F. nucleatum*, *C. rectus*, *E. corrodens*. Results were statistically processed.

**Results:** In aggressive periodontitis, mean pocket depth, bleeding index and percentage of pockets  $> 4$  mm were significantly higher than in chronic periodontitis. Apart from obvious difference between those two subgroups in the counts of *A. actinomycetemcomitans*, *C. rectus* numbers were significantly higher in aggressive periodontitis. Groups selected according to IL-1 polymorphisms did not reveal statistical significance in clinical or microbial parameters. Correlation analysis has shown that *C. rectus* is a pathogen closely bound with clinical parameters of periodontal state, especially in chronic periodontitis group. Interesting is correlation between *Porphyromonas gingivalis* and plaque index - negative in aggressive periodontitis, positive in chronic periodontitis.

**Conclusion:** Aggressive periodontitis is characterized by worse clinical state in the presence of similar amount of dental biofilm. IL-1 polymorphism seems not to have direct influence on studied parameters. *C. rectus* shows closest bind with patients' clinical state and nature of its pathogenicity needs to be further studied.

## Topic: Clinical Research: Diagnosis and risk factors

**P0217****Elastase concentration in saliva in chronic periodontitis patients**

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Warsaw/Poland

**Aim:** The aim of the study was to determine the concentration of elastase in saliva in patients with chronic periodontitis compared to healthy individuals.

**Material and Methods:** The study included a group of 32 patients (17 females and 15 males) with diagnosed chronic periodontitis. Within the group two subgroups were distinguished according to periodontal pocket occurrence: pocket depth (PD)  $\geq$  4mm (16 patients) and PD < 4mm (16 patients). The control group consisted of 13 individuals (7 females and 6 males) with healthy periodontium. The enzyme-linked immunosorbent assay method was employed to determine the concentration of elastase in stimulated saliva in patients with chronic periodontitis and with pocket depth (PD)  $\geq$  4mm and PD < 4mm, as well as in saliva of healthy individuals.

**Results:** A significantly higher concentration of elastase was observed in patients with periodontitis compared to healthy individuals ( $p < 0.01$ ). Also a significant difference in elastase concentration in saliva was observed between the PD  $\geq$  4mm and PD < 4mm groups and between the PD  $\geq$  4mm and control groups as well as no statistically significant differences were observed between the PD < 4mm and control groups.

**Conclusion:** The elastase concentration in saliva can be considered as one of biochemical indicators of severity of periodontitis.

## Topic: Clinical Research: Diagnosis and risk factors

**P0218****Oral hygiene parameters in Austrian dental students: A cross-sectional study.**

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Vienna/Austria

**Aim:** In the two last decades in industrial countries the prevalence of caries decreased significantly due to the frequent use of fluoridated toothpaste, improved health consciousness and self-care practice. Periodontal diseases and non-carious tooth lesions however show increasing prevalence in some populations. One etiologic factor for gingivitis is insufficient oral hygiene. Non-carious lesions may result from intrinsic or extrinsic acids or parafunctional activities. In knowledge of the current changes in oral health worldwide we wanted to gather data on this topic in Austria. Dental students receive training to educate their future patients in oral hygiene methods. Therefore we hypothesized better oral indices in this group.

**Material and Methods:** In a convenience sample of one cohort of Austrian dental students (University dental clinic Vienna,  $n=60$ ) the medical and dental history was taken and the following intraoral parameters recorded: DMFT-Index, CPI, BEWE-Index, API and PBI, saliva pH and buffering capacity. Information on nutrition, fluoride intake, and oral hygiene

measures were gathered. Intraoral photographs were taken. Statistics: Descriptive, Spearman correlation coefficient.

**Results:** Data collection is still ongoing and will be finished by end of 2011. Preliminary data analysis shows a trend in poor oral hygiene and high DMFT values. Gingivitis and attrition are frequent findings; erosions are mainly seen in students with a history of bulimia. Mean buffering capacity and saliva pH were low.

**Conclusion:** The findings show surprisingly bad oral hygiene indices in dental students. The high DMFT Index and the gingivitis rate befit well into this picture. Various putative reasons for these findings have to be discussed.

## Topic: Clinical Research: Diagnosis and risk factors

**P0219****Gene polymorphisms in related to both chronic periodontitis and type 2 diabetes mellitus**

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Beijing/China

**Aim:** To identify the possible gene polymorphisms in related to both chronic periodontitis (CP) and type 2 diabetes mellitus (T2DM).

**Material and Methods:** 110 T2DM (WHO, 1999) and 129 non-diabetic Chinese Han subjects with different periodontal conditions (CDC, USA 2007) were included. Questionnaires and full mouth periodontal examinations (PD/B/AL/PLI) were given to all subjects. 72 SNPs from 31 candidate genes were genotyped by the Sequenom Mass ARRAY system. The Hardy-Weinberg equilibrium test were done by  $\chi^2$  test.

**Results:** (1) 4 SNPs of 4 genes showed significant difference in genotype distributions between diabetes and non-diabetes ( $P < 0.05$ ): Matrix Metalloproteinases-1 (MMP-1) rs1144393, Leptin Receptor (LEPR) rs1137100, (diponectin (APN) rs1501299 and Phosphoinositide-3-kinase regulatory subunit 1 (PIK3R1) rs251406. (2) The periodontal condition in diabetic subjects were much severe than non-diabetes ( $P < 0.05$ ). After adjusted for the periodontal condition, the previous 4 SNPs still showed significant difference. (3) 7 SNPs of 6 genes showed significant difference in genotype distributions between mild CP and moderate/severe CP: MMP-1 rs1144393, APN rs1501299, LEPR rs1137100 and rs1137101, Interleukin-1 (IL-1) rs16944, Estrogen Receptor-2 (ER-2) rs2234693 and PIK3R1 rs7713645. (4) LEPR rs1137100 and APN rs1501299 showed significant difference in genotype distribution both between diabetes/non-diabetes group and mild/moderate to severe CP group ( $P < 0.05$ ). (5) The more risk genotypes the patients carried, the higher risk the diseases occurred ( $P < 0.05$ ). The level of Fasting Blood Sugar (FBG) and Triglyceride (TG), the number of Attachment Loss (AL)  $\geq$  3mm and AL  $\geq$  4mm sites increased as the number of risk genotypes increased ( $P < 0.05$ ).

**Conclusion:** In Chinese Han population, the gene polymorphisms of LEPR rs1137100 and APN rs1501299 were related to both CP and T2DM.

Topic: Clinical Research: Diagnosis and risk factors

## P0220

### Changes in the GCF amount of individuals in periodontal maintenance under orthodontic treatment

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**Aim:** The aim of this study was to measure the alterations in the amount of gingival crevicular fluid (GCF) of teeth during orthodontic tooth movement in adults with chronic periodontitis under a periodontal maintenance program.

**Material and Methods:** The GCF was collected with paper stripes from presson sides of teeth in 10 patients (7 males and 3 females) and measured in microlitres on Periotron™ in six distinct periods of time (day -7, day 0, day 1, day 7, day 14, day 21). Patients were under supervised program of plaque control. Wilcoxon test was applied to compare the data.

**Results:** The results shown that the effective plaque control reduces the amount of GCF from day -7 to day 0, followed by an elevation until day 7 after the beginning of orthodontic tooth movement and a new reduce from day 7 to 21. The highest amount of GCF was found on day 7, one week after the beginning of tooth movement, while the smallest found on day 0.

**Conclusion:** After analyzing the results, we conclude that the orthodontic tooth movement increased the amounts of GCF from day 0 to day 7.

Topic: Clinical Research: Diagnosis and risk factors

## P0221

### Minor manifestations of periodontal diseases in young adults with type 1 diabetes mellitus. Periodontal and microbiological findings.

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**Aim:** The aim of the present study was to evaluate periodontal status and microbiological conditions in young adults with insulin-dependent diabetes (IDDM) in comparison with age- and sex-matched non-diabetic controls.

**Material and Methods:** Forty-one patients, 18–24 years of age with IDDM since childhood, were examined and the results were compared to those of a group of 41 sex- and age-matched non-diabetic controls. According to the HbA1c %, the group of diabetic patients was divided into two groups, with good or poor metabolic control.

**Results:** Periodontal health, expressed in probing pocket depths and marginal bone loss, was fairly good in all patients. Fifty percent of the patients in the study and control groups displayed probing pocket depths > 4 mm, mostly pocket depths 4 mm. These findings were also equally distributed among the patients with good and poor metabolic control. No significant differences were found between the groups regarding bleeding on probing, but in the number of sites with excessive bleeding the study group

exhibited higher scores than the healthy controls. Different microbiological species were equally distributed between the groups.

**Conclusion:** Neither periodontal nor microbiological status in young adults with IDDM differs from that of healthy controls.

Topic: Clinical Research: Diagnosis and risk factors

## P0222

### A study of alveolar bone loss following fixed orthodontic appliance therapy

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Kota Bharu/Malaysia

**Aim:** This study aims to describe changes in alveolar bone level before and after six months of treatment in patients with fixed orthodontic appliance.

**Material and Methods:** Patients whom were indicated for fixed orthodontic appliance were recruited to participate in this study. They were treated by one orthodontist using edgewise straight wire system. Digital panoramic radiograph of the patients were examined and the distance from cemento-enamel junction to alveolar crest (CEJ-AC) is measured before and after six months of follow up with mean were 7.1 months (SD 1.69). The measurements were taken at mesial and distal of teeth from 16 to 26 and 36 to 46 and were categorized into 3 groups for analysis: anterior, premolar, and molar.

**Results:** Samples included ten females (62.5%) and six males (37.5%) patients with mean age were 15.3 years (SD 3.44). Statistically significant changes in the CEJ-AC distance were found in the premolar 0.06mm (95%CI: 0.32, 0.93) and molar teeth 0.07 (95%CI: 0.03, 0.10) but not in the anterior teeth 0.03mm (95%CI: 0.01, 0.08). Mean changes of anterior, premolar and molar teeth also showed higher at the distal with 0.06 (SD 0.06), 0.08 (SD 0.05) and 0.08 (SD 0.09) compared to mesial with 0.03 (SD 0.09), 0.07 (SD 0.08) and 0.06 (0.07) respectively.

**Conclusion:** This study showed alveolar bone loss may start as early as six months following the initiation of fixed orthodontic treatment and more loss at the distal compared to mesial for the anterior, premolar and molar teeth.

Topic: Clinical Research: Diagnosis and risk factors

## P0223

### The psychological condition of patients complaining of halitosis

J. Wang, L. He, T. Liu

Beijing/China

**Aim:** To evaluate the distribution of patients who visited periodontal department complaining of halitosis and the difference of psychological condition between patients with genuine halitosis and pseudo-halitosis.

**Material and Methods:** The subjects included 97 patients who visited periodontal department of Peking University, school and hospital of stomatology, with complaint of halitosis. The degree



of halitosis was estimated by the Organoleptic Test (OLT). The Cornell Medical Index (CMI) Health Questionnaire was used to evaluate the psychological condition of patients.

**Results:** 41.2% patients who complained halitosis had actually no odor while 58.8% had genuine halitosis. Among all the patients, 67.3% male patients had detectable halitosis while 48.8% in female patients. However, there was no statistically significant difference between male and female patients with genuine halitosis ( $p=0.06$ ). Regardless of sex, subjects with pseudo-halitosis showed statistically significant higher symptoms of sensitivity than those with genuine halitosis ( $p=0.034$ ). There was a low negative correlation between the degree of halitosis and symptoms of sensitivity ( $r=0.215$ ,  $p=0.034$ ). After adjustment by sex, within the male group, there was statistically significant difference of symptoms of sensitivity between patients with genuine halitosis and pseudo-halitosis ( $p=0.027$ ). In addition, degree of halitosis was correlated to the symptoms of sensitivity in male patients ( $r=-0.307$ ,  $p=0.027$ ). However, these outcomes were not found in female group.

**Conclusion:** The psychological condition was different between pseudo-halitosis and genuine halitosis patients, and the former showed higher symptoms of sensitivity. Furthermore, sensitivity may be more significant in male patients.

Topic: Clinical Research: Diagnosis and risk factors

P0224

### Proteomic profile of non-bacterial proteins in periodontal pockets-- a pilot study

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Modena/Italy

**Aim:** In this study, we attempted to identify the proteins involved in periodontitis comparing the proteomic profile of interproximal pocket tissue affected by the periodontal lesion with interproximal healthy tissue in the same subject, in sites where no periodontopathogenic bacteria were detectable.

**Material and Methods:** Using specific inclusion and exclusion criteria, we enrolled 15 subjects affected by severe chronic periodontitis. The subjects presenting at least one intrabony defect (next to a healthy interproximal site to be included in the flap design) suitable for treatment by osseous resective surgery, were considered eligible for this study. Biopsies of connective tissue were harvested from the intrabony component of the defect and from healthy tissue (from the secondary flap) and immediately frozen at  $-80^{\circ}\text{C}$ . A two-dimensional gel electrophoresis system was used to detect differences in protein expression between pathologic and healthy tissue and protein identification by LC-MS/MS analysis was performed.

**Results:** Six proteins (tropomyosin  $\alpha$ -4 chain, 14-3-3 protein  $\gamma/\delta$ , putative heat shock protein HSP 90- $\beta$ , peroxiredoxin-1, fatty acid binding protein, S100-A9) displayed a higher while five a lower (annexin A1, actin cytoplasmatic-1, carbonic anhydrase-2, Ig K chain C region and flavin reductase) protein expression level in pathologic tissue compared with healthy tissue.

**Conclusion:** The highlight of proteins involved in the immunological and cytokine signaling cascade mediation or in connective and epithelial regeneration and differentiation shows that the pathogenic process is active in periodontal sites

also in absence of periodontopathogen microbiota. Besides, proteomic analysis could be considered very useful in studying the pathogenesis of periodontitis.

Topic: Clinical Research: Diagnosis and risk factors

P0225

### Gingival tissue dimensions and periodontal biotype

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Würzburg/Germany

**Aim:** Different types of periodontal biotypes (thin vs. thick) have been described in literature and have been associated with specific crown anatomy. To date it has been not been established by clinical measurements, whether these periodontal biotypes may be linked to specific gingival tissue dimensions and a distinct shape of the clinical crown. Therefore the aim of this study was to assess gingival tissue dimensions and its corresponding biotype.

**Material and Methods:** 80 periodontally healthy subjects, (46 female / 34 male, age 21-36) volunteered to participate in the study. Evaluating teeth 13-23, periodontal biotype was categorized into two different grades and length/width dimensions of the clinical crown were measured to the nearest of 0.5 mm using a PCP-12 periodontal probe. Additionally vertical gingival tissue dimensions were recorded by bone sounding at the mesio-buccal, midbuccal and distobuccal aspect after local anesthesia.

**Results:** Recorded mean values of the mesio- and distobuccal measurements were 3.2 ( $\pm 0.24$ ) mm for the thin and 3.2 ( $\pm 0.28$ ) mm for the thick biotype. Mean values of the midbuccal measurements were 2.5 ( $\pm 0.40$ ) mm for the thin biotype and 2.5 ( $\pm 0.44$ ) mm for the thick biotype and did not differ statistically. Furthermore observed crown length/width ratios were not correlated to distinctive gingival biotypes.

**Conclusion:** Within the limits of this study, both periodontal biotypes reveal similar gingival tissue dimensions. Furthermore crown anatomy (length/width ratio) does not seem to be linked to a distinctive periodontal biotype.

Topic: Clinical Research: Diagnosis and risk factors

P0226

### The fluctuation of periodontal indexes during the same day: a pilot study

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Modena/Italy

**Aim:** This was to determine if periodontal indexes, from which we choose the periodontal therapy, can be influenced by the time of day they are collected.

**Material and Methods:** Using specific inclusion and exclusion criteria, we enrolled 21 patients. The study involved the comparison of the full-mouth plaque score (FMPS), full-mouth bleeding score (FMBS) and periodontal screening and recording (PSR) index in three successive stages of the same day, (8.30-T1,

11.30-T2, 14.00-T3) during the maintenance phase. Oral status of the patients and lifestyle were also considered.

**Results:** Comparing T1, T2 and T3 it can be seen that the FMBS was significantly different in each phase: T1 ( $m \pm SD$  9,17  $\pm$  6,61), T2 (6,95  $\pm$  6,50) and T3 (5,77  $\pm$  5,95). T1-PSR (0,91  $\pm$  0,21) was greater than T2 (0,81  $\pm$  0,26) and T3 (0,80  $\pm$  0,25). The evaluation differential resulted positively conditioned by the number of teeth with a negative prognosis (NPT) for PSR and for females for FMPS. The NPT affected the PSR negatively and the FMPS and FMBS positively. Years of smoking and the number of cigarettes per day affected the FMPS and FMBS negatively whilst being a smoker clinically improved the FMPS and FMBS.

**Conclusion:** The FMBS and PSR show significant fluctuation during the day. In order to achieve more reliable data of the indices, multiple recordings during the day should be taken. The NPT and smoking are able to influence, in a complicated way, the periodontal indices and their fluctuations.

Topic: Clinical Research: Diagnosis and risk factors

## P0227

### Incidence of mandibular nutrient canals in periodontal diseases: A prospective case control study using cone beam CT

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**Aim:** The aim of this study is to evaluate radiographically, the presence or absence of nutrient canals in controls and patients with periodontal diseases, with severity of bone loss using cone beam computed tomography (CBCT).

**Material and Methods:** CBCT examinations of 194 patients (92 female, 102 male patients, age range was 17-83, mean 36,7 years) were evaluated retrospectively. Of all patients, 114 patients had periodontal diseases whereas 80 patients were control subjects. CBCT images were reconstructed as axial, sagittal, cross-sectional and panoramic images in order to detect mandibular nutrient canals as well as bone loss and all measurements were done by means of the machine's software.

**Results:** Nutrient canals were observed in 42% of the control group and 86% of periodontitis patients. Nutrient canals were found more in advanced age group in chronic periodontitis with bone loss of more than half of the root length ( $p > 0.05$ ).

**Conclusion:** Clinical and radiographic parameters revealed that mandibular nutrient canals were more frequent in periodontal disease. Increased frequency of nutrient canals of 3 or more than 3 was seen with increased severity of bone loss.

Topic: Clinical Research: Diagnosis and risk factors

## P0228

### MDA, 8-OHdG, TAS and RANKL/OPG levels changes after non surgical treatment.

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**Aim:** The objective of this study is to determine the changes that occur in the crevicular fluid composition in patients with advanced chronic periodontitis after the non surgical treatment phase. The ratio Rank/OPG, malondialdehyde (MDA), 8-hydroxy-deoxyguanosine (8OHdG) and total antioxidant status (TAS), was measured.

**Material and Methods:** The study was made in single rooted teeth from 25 patients (10 from a control group and 15 from an advanced chronic periodontitis group). Patients with periodontitis underwent clinical and biochemical analysis before and after the non surgical treatment. The crevicular fluid samples were taken in pockets  $> 6$ mm and in healthy areas from the test group patients. The crevicular fluid volume was measured with the Periotron 8000 and analyzed through immunoassay techniques. Finally the values obtained with the patients from the control group were compared.

**Results:** In the baseline, we have observed a statistically significant increase of 8-OHdG, MDA and RANKL/OPG together with a drop of TAS in the test group. These levels have decreased dramatically after the non surgical treatment, reaching health levels similar to those found in the control group, leading to an increase of the TAS level. In healthy areas of the periodontitis patients, we haven't observed an increase of the oxidative stress markers nor of the RANKL/OPG.

**Conclusion:** The basic periodontal treatment can restore and control the patient antioxidant capacity, through the modification of MDA and 8-OHdG values, and can also reduce the bone loss when increasing the ratio RANKL/OPG.

Topic: Clinical Research: Diagnosis and risk factors

## P0229

### Gingival Crevicular Fluid Human $\beta$ -defensin-1, Human $\beta$ -defensin-3 Levels in Smoker and Non-smoker Patients

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**Aim:** Antimicrobial peptides are among the most important components of the immune system. Defensins, an antimicrobial peptide, has biological applications in many tissues. The purpose of this study was to evaluate gingival crevicular fluid human  $\beta$ -defensin-1 and human  $\beta$ -defensin-3 levels at periodontal healthy patients, gingivitis patients and chronic periodontitis patients with and without smoking habit.

**Material and Methods:** Eighty individuals were included in this study: periodontally healthy non-smoker 20 patients, 20 non-smoker patients with gingivitis, 20 non-smoker patients with chronic periodontitis, 20 smokers patients with chronic periodontitis. The periodontal status of the subjects was determined by periodontal clinical measurements and radiographical evaluations. An enzyme linked-immuno-sorbent assay was performed for human human  $\beta$ -defensin-1 and human  $\beta$ -defensin-3 levels in gingival crevicular fluid.

**Results:** Clinical periodontal parameters were significantly higher at chronic periodontitis patients than periodontal healthy and gingivitis patients. Human  $\beta$ -defensin-1 and human  $\beta$ -defensin-3 levels of periodontally healthy patients were found statistically lower than of other groups. Human  $\beta$ -defensin-1 and human  $\beta$ -defensin-3 levels in gingival crevicular fluid of smoker

chronic periodontitis patients were statistically higher compared to non-smoker chronic periodontitis and gingivitis patients.

**Conclusion:** It has been suggested that human  $\beta$ -defensin-1 and human  $\beta$ -defensin-3 are markers of disease activity in several inflammatory diseases. Smoking changes the microorganism profile in tissues and increases human  $\beta$ -defensin-1 and human  $\beta$ -defensin-3 release from tissues against microorganisms. Human  $\beta$ -defensin-1 and human  $\beta$ -defensin-3 may play an important role in periodontal disease pathogenesis at smokers.

Topic: Clinical Research: Diagnosis and risk factors

## P0230

### Evaluation of the periodontal diagnostic usefulness of the CoPeriodontix® software by Straumann compared to the parallelized radiographs.

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Valencia/Spain

**Aim:** Periapical parallel radiographs (PPR) are the most common screening method in periodontics. Computed tomography (CT) provides a three dimensional image of the anatomical structures. Straumann's new software CoPeriodontix® allows the use of CT as a diagnostic tool for periodontal defects. CT images analyzed with Straumann's new software CoPeriodontix® provides more sensitivity and specificity in periodontal bone defects diagnosis.

**Material and Methods:** An in vitro study was made by three different trained observers on natural bone defects on skulls. The first observer measured bone levels and diagnosed bone defects and furcation lesions (Class I, II or III). Parallel radiographs and computed tomography were made. A second and a third examiner measured the bone levels and defects on the radiographs and CT/CoPeriodontix®.

**Results:** Comparison between data obtained from the radiographs and the CT/CoPeriodontix® software and the direct measurements on the skulls suggest that CoPeriodontix® software is a valid tool to diagnose periodontal bone defects (vertical, horizontal and furcation lesions).

**Conclusion:** Straumann's new software CoPeriodontix is a useful tool to diagnose periodontal defects with good sensitivity and specificity.

Topic: Clinical Research: Diagnosis and risk factors

## P0231

### Impact of tobacco smoking on periodontal tissues, liver function and antioxidant system in rats

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**Aim:** Aim of our research was to develop experimental model of periodontitis in rats and to study the impact of tobacco smoke (TS) on it.

**Material and Methods:** We used 40 Wistar rats of both genders, 3 months old. Animals were divided into 5 groups: 1st group – intact rats; 2nd group – intact rats on which we study TS action; 3rd group – rats with periodontitis; 4th group – rats with periodontitis on which we study TS action; 5th group – rats with periodontitis on which we study TS action with 1 month follow-up. We made the sampling of blood, autopsy of cheek, gum and liver tissues. Using the biochemical methods we studied the activity of following ferments: elastase, catalase, alkaline phosphatase (AF), ALAT and also malonic dialdehyde (MDA).

**Results:** In group # 2 showed significant increase of inflammation markers, suppression of antioxidant system. Periodontitis modeling in group # 3 also showed similar metabolic dysfunctions. In group # 4 activity of elastase was significantly increased, amount of MDA was 2,1 times more than in intact animals, catalase activity was significantly suppressed. Liver metabolism in group # 4 was also impacted. Activity of elastase in liver tissue was significantly increased, amount of MDA was 2,1 times more than in intact animals, catalase activity was significantly suppressed, activity of AF and ALAT was increased. In group # 5 all biochemical markers came into normal except of level of MDA.

**Conclusion:** Thus the experiment showed negative but reversible effect of short-term tobacco smoking on oral cavity tissues and liver function in rats.

Topic: Clinical Research: Diagnosis and risk factors

## P0232

### Serum levels of DKK-1 in patients with aggressive periodontitis and chronic periodontitis

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Beijing/China

**Aim:** DKK-1 is a natural inhibitor of Wnt signaling, which is associated with some osteolytic diseases such as rheumatoid arthritis and bone metastases in some malignant tumors. The aim of this study was to determine whether DKK-1 expression was associated with periodontitis and to investigate the potential factors for serum DKK-1 levels.

**Material and Methods:** Eighty subjects were enrolled, including 20 aggressive periodontitis (AgP), 20 chronic periodontitis (CP), 20 age-matched healthy subjects for AgP and 20 age-matched healthy subjects for CP. Serum DKK-1 levels were determined using an ELISA assay.

**Results:** (1) Serum DKK-1 levels in AgP patients ( $12.36 \pm 3.19$  ng/ml) were significantly higher than those in CP patients ( $8.90 \pm 2.73$  ng/ml). However, no significant difference of serum DKK-1 levels was found between AgP group and its matched healthy control, nor that between CP group and its controls. (2) No correlations between the serum DKK-1 levels and the periodontal parameters (PD, AL, BI, BOP) were detected. (3) Serum DKK-1 levels in all the samples were found to be negatively correlated with age ( $r = -0.453$ ,  $P = 0.000$ ). Multiple linear regression analysis showed that serum DKK-1 levels were significantly negatively correlated with age.

**Conclusion:** No association between periodontitis and serum DKK-1 levels was found. Age has impact on the serum levels of DKK-1. The concentration of serum DKK-1 levels decreased with age.

Topic: Clinical Research: Diagnosis and risk factors

## P0233

### The different periodontal defect pattern in general aggressive periodontitis

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Beijing/China

**Aim:** To find out the different patterns of destruction in general aggressive periodontitis.

**Material and Methods:** 99 patients with aggressive periodontitis and 88 healthy controls were recruited in this study. The 99 patients were diagnosed as general aggressive periodontitis, according to the 1999 classification. According to the pattern of periodontal damage, the general aggressive periodontitis patients were divided into two groups. If the incisors and first molars suffered more serious bone defect or attachment loss, the pattern of defection should be molar-and-incisor-dominant. On the contrast, the periodontal defection should be similar among teeth in the non- molar-and-incisor-dominant pattern. The general information and periodontal assessments of the two groups of aggressive patients and controls were described.

**Results:** 1. There were 33 patients was involving in the molar-and-incisor-dominant group, and 66 patients was involved in non- molar-and-incisor-dominant group. The molar-and-incisor-dominant aggressive periodontitis patients were a little younger than the non- molar-and-incisor-dominant aggressive periodontitis patients ( $25.4 \pm 5.5$  vs  $29.3 \pm 6.0$ ). The non- molar-and-incisor-dominant aggressive periodontitis patients suffered more serious and more extensive periodontal defection. 2. When compared the body mass index (BMI) of aggressive periodontitis patients with the controls, the percent of underweight and overweight was higher in aggressive periodontitis patients. The percent of underweight patients was higher in the molar-and-incisor-dominant aggressive periodontitis group, but the percent of overweight was higher in the non-molar-and-incisor-dominant aggressive periodontitis group.

**Conclusion:** According to the pattern of periodontal defection, the general aggressive periodontitis can be divided into molar-and-incisor-dominant and non- molar-and-incisor-dominant forms, which have distinctive clinic character, may share different general or local risk factors.

Topic: Clinical Research: Diagnosis and risk factors

## P0234

### Clinical and radiographical evaluation of periodontal biotype of maxillary central incisors: a pilot study for the validity and the reliability of the measurements

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**Aim:** The aim of this study was to evaluate the correlation between the clinical and radiographical measurements and their repeatability in determining the periodontal biotype of maxillary central incisors .

**Material and Methods:** The study included 19 patients. The clinical measurements: keratinized gingival width, gingival margin thickness, central papilla's height, contact point position were recorded. A parallel profile and a conventional periapical radiograph with markers for soft tissue profile for central incisors were recorded. CEJ-bone crest distance, connective attachment thickness and bone plate thickness at three different points, papilla-bone crest distance were measured. The relations between the clinical and radiographical measurements were tested by Pearson's correlation coefficient analysis. The reliability of the radiographic measurements was expressed as the standard deviation of the differences divided by 2.

**Results:** For radiographic images, the components of the dento-gingival unit were measured and repeated one-week interval .The mean values for CEJ-bone crest, the connective tissue attachment thickness, the bone plate thickness at crest level were 1.95mm, 0.79mm and 0.5mm, respectively. The correlation coefficient for right and left incisors were  $r = 0.701$ ,  $p$

**Conclusion:** Within the limits of this study, both parallel profile and periapical radiographic measurements were found valid and reliable for the evaluation of periodontal biotype of maxillary central incisors.

Topic: Clinical Research: Diagnosis and risk factors

## P0235

### Interproximal Papilla: Factors influencing its presence.

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**Aim:** The aim of this study was to evaluate the influence of the distance from contact point to the bone crest, periodontal biotype, tooth shape, sex and age, in the presence/absence of the interproximal papilla.

**Material and Methods:** 130 maxillary anterior interproximal sites were examined. The presence/absence of interproximal papilla was determined by photograph analysis. The measurement of the distance from contact point to the bone crest was calculated from standardized periapical radiographs using a digital calliper. The periodontal biotype was classified as thin or thick by external evaluators based on clinical photographs. Each maxillary incisor was categorized into square or triangular using an informatic program. The information about the variables sex and age was registered for further statistical analysis.

**Results:** The results showed a statistically significant negative correlation between the distance from contact point to the bone crest and presence of interproximal papilla ( $p < 0.01$ ).

No significative differences were found between the variables periodontal biotype, tooth shape, sex and age and presence of interproximal papilla ( $p > 0.05$ ). However, a negative correlation was detected between periodontal biotype, tooth shape and sex and the presence of interproximal papilla.

**Conclusion:** On maxillary anterior teeth, the distance from contact point to the bone crest is highly associated with the presence or absence of the interproximal papilla.



Topic: Clinical Research: Diagnosis and risk factors

## P0236

### THE MONITORING THROUGH SPECTROPHOTOMETER OF THE DENTAL EROSION IN ITS CLINICAL COURSE

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**Aim:** The aim of this study was to evaluate the possibility of monitoring the clinical course of dental erosion using a spectrophotometer.

**Material and Methods:** We conducted an in vitro study under standardized conditions using 11 adult bovine teeth. The study was divided in six stages (T0-T5) and conducted at a standard temperature of 22°C. T0: Teeth were cleaned by ultrasonic scaler and soft brushing. T1: Teeth were demineralized using lemon juice (5 min.). T2: A first immersion (15 min) in a mouthwash whose stated purpose is to stop the progression of the erosion process (Elmex Erosion Protection®). T3: A second demineralization phase in lemon juice (5 min.). T4: A second immersion in mouthwash (45 min.). T5: A third demineralization in lemon juice (5 min.). After these experimental phases we compared photographs and data obtained in phase T0 with those found after phase T1, then we compared these with values recorded after phase T3 firstly and T5 secondly.

**Results:** Collected data were analyzed with inferential (student T test) and descriptive statistic. In both statistical analysis chromatic data (L.a.b. System) have showed significant results.

**Conclusion:** The measurements obtained in the various stages showed us that it is possible to monitor the clinical course of dental erosion and the effectiveness of any treatment aiming to its arrest.

Topic: Clinical Research: Diagnosis and risk factors

## P0237

### EFFECT OF SMOKING ON PERIODONTAL STATUS ON HEALTY YOUNG POPULATION

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Istanbul/Turkey

**Aim:** It has been shown that tobacco is a significant risk factor for periodontal disease. The purpose of this study was to examine the effect of tobacco consumption on the periodontal condition of a young and healthy population.

**Material and Methods:** The study population consisted of 80 young Turkish dental students. All the subjects completed a questionnaire on age, oral hygiene habits, previous dental examinations, and quantity and of tobacco use. The periodontal examination consisted of gingival index (GI), plaque index (PI); periodontal bleeding index (PBI); probing depth (PD); and clinical attachment level (CAL)

**Results:** 27,5% of the subjects were smoking more than 10 cigarettes per day, 25% were smoking between 5 and 10 cigarettes per day and 47,5% were non-smokers. The mean PI, PBI and CAL were significantly higher in smokers. PI, GI and CAL values were high on maxillary teeth of smokers. Mean PD and GI were not statistically different in smokers and non-smokers.

**Conclusion:** Smoking produces an adverse effect on clinical periodontal variables and alveolar bone, acting as a potential risk factor for future alveolar bone loss, even at an early age with low tobacco consumption. It is very important to inform young smokers about the risk of this habit in relation to periodontal health and organize cessation program.

Topic: Clinical Research: Diagnosis and risk factors

## P0238

### Salivary levels of antibacterial peptide (LL-37/hCAP-18) in periodontitis patients

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**Aim:** The purpose of this study was to examine the relationship between salivary LL-37 levels and clinical condition in chronic periodontitis (CP) patients. The presence of four periodontopathic bacteria and salivary cotinine levels were also examined in order to assess the impact of these factors on LL-37 production.

**Material and Methods:** Forty-five CP patients with periodontitis were given instructions regarding oral hygiene, then thoroughly treated by conventional scaling and root planing. Unstimulated salivary samples and clinical data including probing pocket depth (PPD), clinical attachment level (CAL), bleeding on probing (BOP) were collected at baseline and after therapy. Salivary concentrations of LL-37 and cotinine were measured by ELISA. *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis*, *Tannerella forsythia* and *Treponema denticola* in saliva were detected by PCR.

**Results:** At baseline, mean salivary LL-37 concentration was  $224.9 \pm 214.1$  ng/ml, and a high prevalence of periodontopathic bacteria was observed. High salivary LL-37 levels were significantly associated with presence of *T. denticola* and higher percentage of teeth with PPD  $\geq 5$  mm. In addition, higher salivary cotinine levels ( $\geq 8$  ng/ml) were negatively associated with salivary LL-37 levels. After the initial periodontal therapy, mean PPD, CAL and percentage of BOP were significantly improved, and salivary LL-37 concentration was decreased ( $83.4 \pm 123.1$  ng/ml).

**Conclusion:** Salivary LL-37 level was positively correlated with severe periodontal destruction. The negative correlations between salivary LL-37 and cotinine levels also suggest that smoking or long-term exposure to environmental tobacco smoke can lead to lower LL-37 levels in the oral cavity and increased risk of periodontitis.

Topic: Clinical Research: Diagnosis and risk factors

## P0239

### DETECTING EARLY ENAMEL EROSIONS THROUGH A SPECTROPHOTOMETER

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**Aim:** The aim of this study was to see if it was possible to detect early enamel erosions through the use of a spectrophotometer. (Spectroshade® MHT, Italy).

**Material and Methods:** The study was carried out with extracted bovine and human series of teeth, treated with different acid substances and exposures. Teeth were analyzed with spectrophotometer and optic microscope before and after each acid exposure. The study was divided into Pilot study (10 bovine teeth) and In vitro Study (30 bovine and 30 human teeth). Phase 0: teeth were cleaned by soft brushing and their surfaces analyzed. Phase 1: teeth were exposed to different cycles of immersion in acid substance (Lime and Sprite® for pilot study and Sprite® for in vitro). Phase 2: chromatic variations were evaluated both with chromatic assessment and optic microscope. Collected data were analyzed with Anova tests.

**Results:** Chromatic data (CIE L.a.b system) obtained showed a significant difference between enamel surfaces after short and medium term acid exposure.

**Conclusion:** The technique used in this study allowed us to study the development of erosion in an in vitro environment. Dental erosion might be intercepted in an earlier phase thanks to a chromatic analysis.

Topic: Clinical Research: Diagnosis and risk factors

## P0240

### INTERRELATIONSHIP BETWEEN THE THICKNESS OF PALATAL MASTICATORY MUCOSA AND BODY MASS INDEX: A PILOT STUDY

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**Aim:** The palatal masticatory mucosa is the main donor site of connective tissue in periodontal plastic surgery during soft tissue grafting. The donor site are important factors in determining the appropriate periodontal plastic surgery method and for predicting the prognosis. The aim of this study is to determine relationship between the thickness of palatal masticatory mucosa and body mass index (kg/m<sup>2</sup>).

**Material and Methods:** Five measurement points which starts from the level of the bottom of the sulcus and have distance 2 mm between, determined by periodontal probe under local anesthesia and measured by endodontic reamer after 20 min. from injection of local anesthesia.

**Results:** There is no relationship between BMI and the thickness of the palatal masticatory mucosa and first incisive tooth gingiva ( $p>0,05$ ).

**Conclusion:** In conclusion, more researches should consider age, gender, dental arch, genetic factors and body weight together with more sample to determine the thickness of the palatal masticatory mucosa.

Topic: Clinical Research: Diagnosis and risk factors

## P0241

### Comparison of HNP-1 and TNF- $\alpha$ in in Smoker and Non-smoker Patients

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**Aim:** Antimicrobial peptides are an important part of the innate host defense. Neutrophil defensins (HNPs) are antimicrobial peptides. HNP-1 is a member of the family of small cationic antimicrobial peptides. The purpose of this study was to evaluate gingival crevicular fluid HNP-1 and tumor necrosis factor-alpha (TNF- $\alpha$ ) levels at patients with and without smoking habit.

**Material and Methods:** Sixty patients were divided into 4 groups: group 1 included non smokers 15 patients with a healthy periodontium; group 2 included non smokers 15 patients with gingivitis; group 3 included non smokers 15 patients with chronic periodontitis; group 4 included smokers 15 patients with chronic periodontitis. An enzyme linked-immuno-sorbent assay was performed for HNP-1 and TNF- $\alpha$  levels in gingival crevicular fluid.

**Results:** The smoker group had a higher clinical parameters compared to non-smokers. TNF- $\alpha$  levels of periodontally healthy patients were found statistically lower than of other groups. TNF- $\alpha$  levels in gingival crevicular fluid of smoker chronic periodontitis patients were statistically higher compared to non-smoker chronic periodontitis and gingivitis patients ( $p<0.05$ ). Levels of HNP-1 levels were higher in smokers chronic periodontitis patients compared to non smokers chronic periodontitis patients but was not statistically significant ( $p>0.05$ ).

**Conclusion:** Subjects with smokers had significantly higher tumor necrosis factor-alpha levels in our study. This may indicates cigarette smoking affects local and systemic host defense systems. Levels of HNP-1 higher smokers chronic periodontitis patients. HNP-1 and TNF- $\alpha$  play a crucial role in the maintenance of gingival health and prevention of periodontal disease.

Topic: Clinical Research: Diagnosis and risk factors

## P0242

### Gingival tuberculosis: a case report

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Casablanca/Morocco

**Aim:** Tuberculosis is a systemic disease with a worldwide distribution and its occurrence is well documented in the literature.

Tuberculosis can affect any part of body and oral cavity is no exception. Tuberculous lesions of oral cavity had become so infrequent that it was virtually a forgotten entity and may pose a diagnosis problem. Further, tuberculosis is considered as a problem of public health in developed countries as well as in underdeveloped countries due to emergence of antibacillaire resistance and to the increase of hiv infections.

**Material and Methods:** We report a case of gingival enlargement which had been diagnosed on the basis of histopathology as a tuberculous lesion of gingiva. The patient had been treated by antituberculous

(combination chemotherapy) therapy and periodontal therapy.

**Results:** The review of literature concerning clinical, histological and oral health considerations, as well as the proper management concerning this lesion is included in this work.

**Conclusion:** we will compare this case with others cases seen in morroco for extracting commun diagnosis criteria.

Topic: Clinical Research: Diagnosis and risk factors

## P0243

### Evaluation of C-reactive protein levels in serum and gingival crevicular fluid in systematically healthy patients with periodontitis

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Istanbul/Turkey

**Aim:** This study aimed to evaluate gingival crevicular fluid (GCF) CRP levels and its correlation between periodontal disease and systemic CRP levels.

**Material and Methods:** A total of 60 patients who were systematically healthy and quit smoking at least 6 months ago were included in the study. The periodontal measurements included plaque index (PI), bleeding on probing (BoP), gingival index (GI), probing depth (PD), clinical attachment level (CAL). GCF was collected using filter paper strips (Periopaper, Oraflow Inc. NY) from the deepest preselected inflamed non-adjacent pocket sites of at least 4mm depth of the incisors and premolars. GCF samples were obtained one week after the clinical measurements. Serum CRP samples were collected and analyzed in Biochemistry department of Istanbul University, Faculty of Medicine. The amount of CRP in the GCF were measured by enzyme-linked immunosorbent assay (ELISA). The CRP levels and clinical parameters were compared by using spearman regression analysis.

**Results:** The mean clinical results were ; PI: 1.44+ 0.34, GI: 1.39+ 0.32, BOP (%): 47.00+25.43, PD: 3.28+0.87 and CAL: 3.89+1.11. The PD and GCF-CRP levels were significantly correlated. (r:0.288, p:0.02) There were no significant correlation between GCF-CRP level and GI (r: -0.009, p: 0.94), CAL (r: 0.20, p: 0.11) and BOP(%) (r:-0.03, p: 0.78). There were correlation between GCF-CRP (0,35+0,52) and serum-CRP (3,31+2,27) .(r: 0.229, p: 0.012)

**Conclusion:** Serum-CRP levels were correlated with GCF-CRP levels. However, serum or GCF CRP levels do not reflect periodontal disease severity.

Topic: Clinical Research: Diagnosis and risk factors

## P0244

### The difference in plaque/bleeding score ratios before and after initial phase therapy in patients with periodontal disease

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St Augustine/Trinidad And Tobago

**Aim:** To determine the change between IR (pre-treatment initial ratio) and FR (post-treatment final ratio) of plaque/bleeding scores for periodontal patients and the subgroups of Diabetics and Smokers.

**Material and Methods:** This was a retrospective study of periodontal patients treated via initial phase therapy by undergraduate DDS students at UWI, Trinidad (2004-2006). Mean differences in IR and FR ratios (IR-FR) for group A (Smokers), group B (Diabetics), group C (both Smokers and Diabetics) and group D (non-Smokers, non-Diabetics) were determined.

**Results:** Ninety-eight patients (32.7% male; 67.3% female) were included with 93 (94.9%) being Chronic Periodontitis and 5 (5.1%) being Aggressive Periodontitis patients. There were 57.1% Afro-Trinidadians and 35.7% Indo-Trinidadians. The numbers per group were group A: 9 (9.2%), group B: 12 (12.2%), group C: 3 (3.1%), group Dc (Chronic Periodontitis): 69 (70.4%) and group Da (Aggressive Periodontitis): 5 (5.1%). The IR-FR per group were group A: -0.29, group B: -1.75, group C: +0.14, group Dc: -0.04 and group Da: 0.00. Gold standards achieved post-treatment of pocket depth reduction and bleeding scores <20% were for group A: 5 (55.5%), group B: 6 (50%), group C: 3 (100%), group Dc: 25 (36.2%) and group Da: 5 (100%). Initial bleeding score was a predictor of final bleeding score via linear regression (p =0.00).

**Conclusion:** The marked deviation of IR-FR from 0 for group A (Diabetics) compared to the other groups may be due to systemic effects on periodontal disease and therapy. Indirectly this may indicate Diabetic control status. Future research should include increased patient numbers and Diabetic control status.

Topic: Clinical Research: Diagnosis and risk factors

## P0245

### Discrepancy in the level of probing depth by using different probes for controlling implant sides

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Zürich/Switzerland

**Aim:** The aim of our study was to measure clinically probing depths around implants by comparing 5 different probes with the Plast-o-Probe (Dentsply) in order to determine the differences between these probes.

**Material and Methods:** 36 patients with 99 implants were divided in three groups. In each group 2 probes (metal and plastic) were compared to a flexible plastic probe (Plast-o-Probe). The experimental groups were as follows: Plast-o-Probe compared to Michigan-Probe (Deppeler), Perio-Probe (Kerr-Hawe); Perio-Probe(Deppeler), ColorvueProbe(Hu-Friedy); Click-Probe (Kerr-Hawe) and halved Plast-o-Probe. Probing depths were collected by one examiner on six sides of each implant. The probe tip was guided along the crown structur to the clinical pocket by using no force and without pain-movement. The length marking of each probe was used to dictate the measured probing depth.

**Results:** The difference in probing depths measured with the Plast-o-Probe and other probes were in all three groups statistical significant. The mean pocket depth measured in the first group was 3.4mm for the metal Michigan-steel probe, 4.2mm for the Perio-Probe (Kerr-Hawe) and 4.5mm for the Plast-o-Probe, in the second group 3.8 for the Colorvue (Hu-Friedy), 3.6 mm for the Perio-Probe (Deppeler) and 4.5 mm for the

Plast-o-Probe and in the third group 4.25mm for Clickprobe (Kerr-Hawe), 5.56mm for Plast-o-Probe and 6.02mm for the halved Plast-o-Probe. The Plast-o-Probe showed the deepest mean measurement and the metal unflexible WHO probe the smallest mean value. Differences in the measured pocket depth up to 7mm were observed.

**Conclusion:** There are major differences in the measured probing depths between the tested probes.

Topic: Clinical Research: Diagnosis and risk factors

## P0246

### 24 h plaque formation rate on artificial crowns of teeth and osseointegrated implants

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**Aim:** The purpose of this study was to compare the 24h Plaque Formation Rate (PFR) after professional tooth cleaning on artificial crowns attached to teeth vs. osseointegrated implants.

**Material and Methods:** 35 patients suffering from mild to moderate periodontitis and displaying at least 1 osseointegrated implant restored with a single crown abutment as well as a matching number of teeth restored with a single crown in the same or contralateral sextant participated in the study. After complete removal of supragingival plaque on all teeth and implants by air polishing with glycine powder patients were asked to refrain from oral hygiene for the next 24h. 24 h after professional plaque removal teeth and implants were stained with a plaque-disclosing solution and on the apical third of the crown surfaces divided into 6 sextants the extent of plaque regrowth was recorded.

**Results:** The observed 24 h plaque regrowth score on crown abutments of implants was 32.6 %  $\pm$  20.1 compared to 51.6 %  $\pm$  21.5 recorded on identical surfaces of the crowns of matching teeth ( $p < 0.001$ )

**Conclusion:** In patients suffering from mild to moderate periodontal disease the observed difference in 24 h plaque formation rate between teeth and implants suggest a significant influence of sulcular fluid rate on the extent of 24h plaque regrowth. Further studies are required for clarification.

Topic: Clinical Research: Epidemiology and delivery of care

## P0248

### Factors affecting sick leave prescribing by dentists

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**Aim:** No previous studies on the sick leave prescribing practices by dentists could be found so this study was conducted.

**Material and Methods:** A questionnaire study covering sick leave prescribing practice during the preceding year and in response to 16 hypothetical patient cases was conducted among 1132 Finnish dentists. The effects of both dentist-related and local structural background variables on sick leave prescribing

were studied.

**Results:** Dentists who prescribed more days of sick leave during the preceding year could be described as younger, male, and practising in large municipalities. The overall number of sick leave days prescribed by the dentists for the entire group of 16 patient cases was 31.6 on average, varying between 0 and 98 days. The economic consequence to society of the sick leave prescription would be 12,036 euro on average. The dentists who had a specialty degree in oral and maxillofacial surgery were prepared to prescribe longer sick leave than other dentists. Dentists working only in public dental services and older dentists would have prescribed significantly less sick leave than others.

**Conclusion:** There is considerable variation among dentists in sick leave prescribing practices. The most significant factors affecting this variation are having a specialty in oral and maxillofacial surgery, and working only in public dental services. The economic consequence of sick leave prescribing by dentists is considerable and further education and guidelines are needed.

Topic: Clinical Research: Epidemiology and delivery of care

## P0249

### Extrinsic dental stain reducing effect of whitening toothpastes

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**Aim:** The purpose of the present study was to compare the effectiveness of whitening toothpaste in reducing extrinsic stain with conventional fluoride paste.

**Material and Methods:** Total of 33 patients with visible extrinsic dental stains were surveyed. Participants were divided into 3 groups according to different toothpastes used. Lobene Stain Index was measured at baseline, after 2 and 4 weeks.

**Results:** Initially there was no significant difference in stain levels between the groups ( $p > 0.05$ ). A significant change in stain intensity was noted only for Elgydium® Whitening dentifrice ( $p = 0.04$ ). When comparing the stain level changes after 4 weeks, it was evident that Elgydium® Whitening group showed the greatest reduction in stain area and it was significant ( $p = 0.005$ ). Moreover, this paste exhibited significant reduction of stain intensity ( $p = 0.03$ ). Changes in stain intensity and area throughout a fourweek period were insignificant for Colgate Total® Advanced whitening and Colgate Total® toothpastes ( $p > 0.05$ ).

**Conclusion:** It was determined that whitening toothpastes can remove dental stains. Whitening toothpaste Elgydium® Whitening was more effective in reducing dental stains than conventional toothpaste Colgate Total® and whitening toothpaste Colgate Total® Advanced whitening. Longer periods of whitening dentifrice use helps to reach better extrinsic stain removal effect.



Topic: Clinical Research: Epidemiology and delivery of care

## P0250

### Preclinical and clinical differences in oral health attitudes and behaviour of dental students in Zagreb, Croatia

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**Aim:** The aim of this study was to investigate oral health behavior and attitude differences between preclinical and clinical dental students in Zagreb.

**Material and Methods:** Students of the School of Dental Medicine in Zagreb were asked to complete a Croatian version of the Hiroshima University-Dental Behavioral Inventory (HU-DBI). The HU-DBI inventory, developed by Kawamura in 1988, comprises 20 items regarding oral health attitude and behavior, and a total score of the questionnaire is derived from the 12 scored items.

**Results:** 503 students (22.3±2.6 mean age) completed a questionnaire, response rate was 85.1%, and 72.4% of respondents were females. Statistically significant differences among questionnaire were observed in 11 statements ( $P<0.05$ ). Preclinical students ( $n=255$ ) more often used toothbrushes with hard bristles, didn't feel they've brushed well unless with strong strokes, and agreed more frequently that they've never been taught professionally how to brush. Their gums tend to bleed more often while brushing, and only a small number of them feel it takes too much time to brush their teeth. Clinical students ( $n=248$ ) more often use child-sized toothbrushes and dye to see how clean their teeth are, but are less likely to check their teeth in a mirror after brushing. Finally, clinical students are significantly less worried about visiting the dentist. Preclinical and clinical students showed a low average HU-DBI score with a significant difference between these two groups (6.33±1.52 vs. 6.91±1.50,  $P<0.001$ ).

**Conclusion:** Since dental students should be oral health role models, there is a greater need for detailed preventative dentistry courses in our curriculum.

Topic: Clinical Research: Epidemiology and delivery of care

## P0251

### Evaluation of Periodontal Health of the Dental Students in Marmara University

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**Aim:** To assess the oral health behaviours and periodontal status of the dental students in Marmara University grouped according to gender, smoking habits and levels of education.

**Material and Methods:** Prior to a full-mouth periodontal examination, including plaque index (PI), gingival index (GI), probing depth (PD), bleeding on probing (BOP) and clinical attachment level (CAL), medical and dental histories were obtained from the 538 students willing to participate in the study.

**Results:** Brushing teeth  $\geq 2$  times a day was found 83% and everyday flossing only in 15% of the students. These behaviours were found in higher percentage in females, non-smokers, and in clinical students ( $p\leq 0.001$ ). Smoking percentage was 23% among all students. The percentage of smoking was higher in males and clinical students ( $p\leq 0.01$ ). The mean PI of all students was  $1.09\pm 0.22$ , GI  $0.91\pm 0.22$ , BOP%  $14.09\pm 10.18$ , probing depth PD  $2.17\pm 0.24$  mm, CAL  $0.12\pm 0.17$  mm, the number of missing teeth  $0.52\pm 1.05$  and the decayed teeth  $2.89\pm 2.79$ . The mean GI and PD were higher but BOP% and CAL levels were lower in the preclinical students than the clinical students ( $p\leq 0.05$ ). The mean PI, GI, BOP% and PD were lower in female than male students ( $p\leq 0.05$ ). The mean PI, BOP% and CAL levels were higher in smokers than in non-smokers ( $p< 0.01$ ).

**Conclusion:** Students should have a comprehensive programme on oral hygiene and negative effects of smoking starting from their first year of education in order to improve periodontal health and oral health behaviours for acting as a role model for their patients.

Topic: Clinical Research: Epidemiology and delivery of care

## P0252

### A computer program answering questions in preliminary periodontal consulting

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**Aim:** In periodontal consulting a lot of consultation time is spent discussing simple things that repeatedly occur in every periodontal conversation. The purpose of our research was to implement a computer program that could answer the basic questions of a patient in preliminary periodontal consultation.

**Material and Methods:** We gathered the questions that repeatedly occurred in every periodontal consultation. We used the language technology tools to implement a virtual periodontal consultant as a dialogue system and set it up on the homepage of our clinic. The patient could have a text-based chat in natural language and obtain the basic information from the computer 24h a day. We have collected 900 real patient-to-computer periodontal conversations with this system. These conversations were then analyzed and the weaknesses were addressed in order to improve the dialogue system. This virtual dental consultant is implemented as a human-assisted dialogue system, so a human consultant can provide assistance in case the computer fails to answer to the patient. The amount of human-assistance was constantly decreased by improving the program.

**Results:** The results show that a virtual consultant provides high user satisfaction and can be effectively used in a real dental clinic as an alternative communication channel. We still provide about 10% human-assistance to the system by assisting only those few that need unique service.

**Conclusion:** A virtual dental consultant has helped to improve the doctor-patient relationship as more time can be spent on examining the patient. The program is currently tailored for Estonian language, yet it can be adjusted for English language.

Topic: Clinical Research: Epidemiology and delivery of care

## P0253

### Oral-health related quality of Life (OHRQoL) in patients with HIV infection undergoing highly active anti-retroviral therapy correlated to periodontal conditions

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**Aim:** Periodontal diseases are considered an early oral symptom in natural HIV infection. Under highly active anti-retroviral therapy (HAART) both, the prevalence of acute oral lesions could decrease and the life expectancy could improve significantly. The aim of this study was to evaluate the periodontal conditions and OHRQoL in a German HIV-positive study population under HAART in a cross section study.

**Material and Methods:** A total of 117 subjects, mean age 44.8 years (min.24;max.76) visiting an HIV outpatient clinic were examined by a calibrated dentist recording probing pocket depths and bleeding on probing. Periodontal probing was performed manually using a PCP-12 probe at six sites per tooth (mesio-buccal, buccal, disto-buccal, disto-oral, oral, mesio-oral). All patients completed the Oral Health Impact Profile (OHIP-G-53) questionnaire. Statistical analysis calculated a Pearson correlation with  $p < 0.05$  for statistical significance

**Results:** Bleeding on probing was observed in a mean of 10.4 teeth (CI-95%:9.1-11.8). Distribution of initial (4-5mm), moderate (5-7mm) and deep (>7mm) pockets follows as a mean of tooth numbers/patient: 6.6, 0.7 and 0.3, respectively (5.5-7.6; 0.5-1.0; 0.1-0.4). There were 5.4 (4.1-6.6) teeth missing at mean. Mean OHIP-G was 28.1 (22.2-34.0) being dominated by psychological discomfort, physical pain and functional limitation. OHIP-G was significantly correlated with shallow ( $r=0.2$ ), moderate ( $r=0.3$ ) pockets and missing teeth ( $r=0.3$ ) through functional disorders, physical pain, psychological disabilities and discomfort ( $p < 0.05$ ).

**Conclusion:** Periodontal status affected OHRQoL even in the HAART era. HAART patients showed similar periodontal conditions as compared to HIV-negatives. Treatment of periodontal pockets and replacement of missing teeth turned out to be the key factors impairing OHRQoL.

Topic: Clinical Research: Epidemiology and delivery of care

## P0254

### Screening Periodontal Disease among Diabetic patients in an Endocrinology Department: Periodontal Self-assessment Questionnaires versus Clinical Examinations

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**Aim:** Periodontal disease is highly prevalent among the diabetic population and has been accepted as the sixth complication of the disease. However, the presence of periodontitis is often not recognized, and therefore left untreated, potentially jeopardizing other aspects of the diabetic condition. Self-reported measures have been used successfully for the surveillance of chronic

periodontal diseases in adult populations. The objective of this study was to investigate the practical value of self-assessment questionnaires in comparison to clinical examinations in a diabetic population, in an attempt to increase periodontal disease screening in a hospital environment.

**Material and Methods:** The investigation was performed on 777 Type 1 and 2 Diabetic patients from the University Hospital of Cantabria, Spain. Participants were asked to complete a written questionnaire investigating the signs of periodontal disease. The perceived periodontal assessments were then validated by clinical examination in 104 patients.

**Results:** The positive predictive value of the survey compared with the clinical examination varied between 58.6 % and 100% for the different parameters. Data from the written questionnaire showed that almost 20% of the diabetics surveyed were completely edentulous or had less than 6 teeth remaining. Of the examined patients, 65% presented periodontal disease whereas only 16% had received periodontal treatment in the past, and the level of understanding of the disease was low in 87%.

**Conclusion:** Self-assessment questionnaires were of high value in evaluating periodontal health status amongst a diabetic population. This study reflects a low level of periodontal awareness among the diabetic population and highlights the need for periodontal health education for health care providers.

Topic: Clinical Research: Epidemiology and delivery of care

## P0255

### Population based screening of periodontal disease and its effect on the health behavior of a community

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**Aim:** Our objective is to know the periodontal health condition and its related health behavior in a typical Japanese community (Itoshima city, Fukuoka, Japan; population 100,204 on 1st Oct, 2011) based on the questionnaire and to evaluate its effect on health behavioral change.

**Material and Methods:** The study population was 46,900 community-dwelling people aged 40 to 74 years and 20,707 of them were covered by the municipal public health check system in Itoshima city in 2011. Finally, 3,762 received a health check in 2011. By 27 July, 2,687 subjects attended the health check and the completed questionnaire was recovered from 2,395. At the conference completed data of all attendants will be presented. The questionnaire for screening of periodontal disease including 8 items was designed to classify 4 stages of periodontal health.

**Results:** The proportion of the subjects who were classified into (I) continuing dental care, (II) the need for detailed examination, (III) the need for receiving health instruction, and (IV) normal condition was 42%, 24%, 16%, and 18%, respectively. When we asked 956 subjects who were recommended a dental visit whether they visited a dental clinic, those who did not intend to go to a dental clinic were 313 (33%). The remainder of the subjects ( $n=643$ ) will be confirmed to have a dental visit in the follow-up study.

**Conclusion:** The self-reported questionnaire as a screening of periodontal disease would have some effect on dental visits for some people. According to the questionnaire, a different strategy

is required for the people who are not willing to have a dental visit.

Topic: Clinical Research: Epidemiology and delivery of care

## P0256

### Is professional experience a predictor of communicational quality? – A controlled study with simulated patients

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**Aim:** To compare the communicational skills of students and dentists by analysing medical interviews with simulated patients focusing on empathy, interview quality and professional experience of the interviewer.

**Material and Methods:** 11 experienced dentists (post-graduate participants of a periodontal MasterOnline program) and 7 dental students were randomly assigned to four simulated patients (SP) with different characters. Before the interviews both groups underwent the same amount of time with a theoretical lecture about communication in dentistry. Evaluation was conducted by means of questionnaires based on a revised concept of the Calgary-Cambridge approach (Haak et al. 2008) for the tutor, the consultation and relational empathy measure (Mercer et al. 2004) for the SP and a general questionnaire of acceptance for the interviewer.

**Results:** Students gained significantly higher scores regarding the total interview quality compared to the dentists ( $x^2=12.103$ ;  $p<0.1$ ). Both groups showed a wide acceptance and appreciation for the communicational training. The SP were perceived to be very realistic for the typical interview situations and the subsequent feed-back from SP, tutors and colleagues was rated as very valuable. For both groups could be shown that empathy has a significant impact on the quality of the dentist-patient conversation.

**Conclusion:** It could be shown that professional experience is no predictor for the communicational quality between the dentist and the patient. Empathy is a key factor for good communication. Both students and dentists are appreciating communication trainings very much.

Topic: Clinical Research: Epidemiology and delivery of care

## P0257

### Impact of occlusal scheme on gingival recession – a pilot study

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Zagreb/Croatia

**Aim:** Correlation between gingival recession and impact of occlusion is still inconclusive. Aim of this clinical study was to determine if occlusal scheme has an impact on gingival recessions on the buccal side in final year dental students of University of Zagreb.

**Material and Methods:** There were 35 participants in this pilot study (mean age 23,8 years). Their oral hygiene habits and periodontal indices were recorded (API, BOP, PD and GR). A comprehensive analysis of occlusion was done with shimstock foil (contacts during left and right laterotrusion on 3 mm). Canines and premolars during contact on working side while in laterotrusion movement in all quadrants were compared with same teeth that weren't in contact. Results are expressed as medians (interquartile range). Intergroup comparisons were made using Mann-Whitney U-test due to small sample size. P values  $<0.05$  was considered statistically significant.

**Results:** There were 12 defined groups (canines, first and second premolars in four quadrants). Statistically significant difference was found in one group (lower right canine,  $p<0,01$ ). 25 lower right canines in contact and in right laterotrusion showed higher value of gingival recession (0.5, 0-1) compared to 10 canines when not in contact (0, 0-0). The rest of groups showed differences, but they were not statistically significant.

**Conclusion:** There appears to be no significant evidence that the concept of occlusion has any impact on appearance of gingival recessions. It should be considered that this is a pilot study, and the result of lower right canine and relatively small number of participants indicate that further study is needed.

Topic: Clinical Research: Epidemiology and delivery of care

## P0258

### Association between Insulin-Like Growth Factor I (IGF-I) – related variables and Periodontitis.

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Greifswald/Germany

**Aim:** To evaluate the association of Insulin-like Growth Factor I (IGF-I) related variables with periodontitis in the population-based Study of Health in Pomerania (SHIP).

**Material and Methods:** From the cross-sectional SHIP, 2299 subjects with clinical attachment level (CAL) data and 2404 subjects with tooth count data aged 20-59 years were available for analyses. Serum IGF-I and IGFBP-3 levels were determined by chemiluminescence immunoassays. Linear and logistic regressions with fractional polynomials were used to study non-linear associations between IGF-related variables and mean CAL or high tooth loss.

**Results:** In fully adjusted models, high IGFBP-3 levels were significantly associated with low mean CAL in the overall sample ( $p=0.03$ ), females ( $p=0.02$ ), and 40-59-year-olds ( $p=0.04$ ). IGFBP-3 levels were inversely associated with increased tooth loss in the overall sample ( $p=0.007$ ), females ( $p=0.02$ ), and 40-59-year-olds ( $p=0.002$ ). No consistent relations were found for IGF-I and IGF-I/IGFBP-3 ratio. However, high IGF-I levels were inversely associated with high tooth loss ( $p=0.04$ ).

**Conclusion:** An inverse relationship between IGFBP-3 and periodontitis was found with higher IGFBP-3 levels being associated with lower mean CAL and low tooth loss. Neither IGF-I levels nor IGF-I/IGFBP-3 ratio were consistently associated with periodontitis.

## Topic: Clinical Research: Epidemiology and delivery of care

**P0259****Evaluation of education of patients with periodontitis by undergraduate dental students.**

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Nantes/France

**Aim:** The goal of this study was to evaluate by mean of questionnaire the way in which periodontitis and biofilm controls are explained to the patient by undergraduate dental students and what patients have retained from the explanation of students.

**Material and Methods:** 19 students and their 19 Patients were interviewed anonymously by mean of semi-structured framework filled by investigator. Four topics were evaluated: explanation of periodontitis, prescription and evaluation of oral hygiene material, explanation of periodontal therapy and awakening and representation of the biofilm control motivation.

**Results:** We noted many discrepancies between student and patient answers. 42 % of students present in overall periodontitis during the first consultation, while only 21% of patients reported having had the presentation of periodontitis. Explanations are mainly delivered orally by students, without demonstration with mirror or diagrams. The origins and the mechanisms of the disease are rarely explained by students. No reevaluation of competences acquired by patients were carried out by students.

**Conclusion:** This study highlights the limits of the methods used by students and the need for other educational strategy. Therapeutic Education is an alternative way to manage patient with a chronic pathology. It is proposed not only to help the patient to understand its disease and its treatment, but also to lead it to become autonomous. Therapeutic Education of patients with periodontitis could enhance knowledge and competences of patients and improve results of periodontal treatment in short and long term.

## Topic: Clinical Research: Epidemiology and delivery of care

**P0260****Trends in oral health in West and East Germany after reunification**S. Schützhold<sup>1</sup>, B. Holtfreter<sup>1</sup>, T. Hoffmann<sup>2</sup>, T. Kocher<sup>1</sup>, W. Micheelis<sup>3</sup><sup>1</sup>Greifswald/Germany, <sup>2</sup>Dresden/Germany, <sup>3</sup>Köln/Germany

**Aim:** The German reunification in 1990 resulted in huge social upheavals in East Germany involving changes in the health care system. Our study aimed to assess the potential effects of these changes on oral health from 1989 until 2005. We hypothesized that oral health improved in the whole republic and converged in West and East Germany during this period.

**Material and Methods:** We evaluated data from 843 East Germans and 1436 West Germans aged 35-44 years from three national cross-sectional studies (German Oral Health Studies) in 1989/92, 1997 and 2005.

**Results:** The probability of having CPI grade 4 diverged between East and West Germany between 1989/92 and 1997 (West: 15.3%-8.5%; East: 21.0%-31.6%) but converged between 1997

and 2005 (West: 8.5%-19.1%; East: 31.6%-26.2%). The effect of region on CPI was constantly significant within all survey years ( $p < 0.05$ ). The number of missing teeth (West: 3.8-2.4; East: 4.6-2.9) and of decayed teeth (West: 2.0-0.4; East: 1.0-0.4) decreased between the first and the last survey in both parts of Germany.

**Conclusion:** After the fall of the Berlin Wall periodontal status deteriorated slightly while caries status improved in West and East Germany from 1989/92 to 2005.

## Topic: Clinical Research: Epidemiology and delivery of care

**P0262****Oral hygiene habits in patients with coronary heart disease**J. Prpic<sup>1</sup>, D. Kuis<sup>1</sup>, A. Bosnjak<sup>1</sup>, M. Ivic Kardum<sup>2</sup>, I. Sciran<sup>1</sup>, S. Pezelj-Ribaric<sup>1</sup><sup>1</sup>Rijeka/Croatia, <sup>2</sup>Zagreb/Croatia

**Aim:** Infection – as a possible factor in development of arteriosclerosis, has been extensively investigated over the past years. It has also been the basis for investigating oral hygiene habits in people suffering from coronary heart disease (CHD). Several investigations proved that poor oral hygiene was related to higher prevalence of coronary heart disease, higher cholesterol and proinflammatory markers. Aim of this investigation was to compare oral hygiene habits of persons suffering from CHD with healthy individuals.

**Material and Methods:** We included 292 patients of both genders who formed a representative sample of western Croatian population – 149 patients were diagnosed with CHD and 143 were controls. Subjects were aged from 35 to 80 years. Oral hygiene habits were assessed by the means of a questionnaire. Questions were made regarding toothbrushing frequency, use of interdental brushes/floss, and frequency of dental check-ups.

**Results:** Majority of patients stated that they brushed at least 3 times a day (60% in control and 48% in CHD group); no significant differences were observed between the groups. When it came to approximal spaces, 65% of controls and 84% of patients with CHD never used interdental means; controls used interdental brushes/floss significantly more often, but rarely on daily basis (11% and 6% respectively). Significant differences were observed in dental check-ups: controls visited their dentists more often.

**Conclusion:** Patients suffering from coronary heart disease have worse oral hygiene habits and are therefore more likely to develop certain infectious oral diseases linked to microbial burden (particularly periodontal disease and caries).

## Topic: Clinical Research: Epidemiology and delivery of care

**P0263****Protective effect of topical *Cordia verbenacea* in a rat periodontitis model: immune-inflammatory, antibacterial and morphometric assays.**

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São Paulo/Brazil



**Aim:** The aim of this study was to evaluate the effects of *C. verbenacea* essential oil topically administered in a rat periodontitis model.

**Material and Methods:** Periodontitis was induced on Wistar rats: one of the mandibular first molars was randomly assigned to receive a ligature, whereas the contralateral molar was left unligated. Animals were randomly divided into two experimental groups: non-treatment group (NT) (n=18): animals received 1 mL of vehicle or *C. verbenacea* essential oil group (C.v.) (n=18): animals received 5 mg/Kg of essential oils isolated from *C. verbenacea*. The therapies were administered topically 3 times daily until the animals were killed on day 11. The specimens were processed for morphometric analysis of bone loss. The ligatures were used for microbiological assessment of the presence of *Aggregatibacter actinomycetemcomitans*, *Tannerella forsythia* and *Porphyromonas gingivalis* using PCR. The gingival tissue was collected to Elisa assay of interleukin (IL)-1 $\beta$  and IL-10 levels.

**Results:** Alveolar bone loss was significantly inhibited by *C. verbenacea* when compared to the NT group ( $p < 0.05$ ). A significant decrease in the levels of IL-1 $\beta$  and increase in the IL-10 amounts was observed in the C.v. group as compared to NT group ( $p < 0.05$ ). A lower frequency of *P. gingivalis* was found in C.v. group ( $p < 0.05$ ).

**Conclusion:** The present study showed that *C. verbenacea* essential oil topically administered might diminish alveolar bone resorption in rat periodontitis model, promoting a positive local imbalance in the pro/anti-inflammatory system and reducing the frequency of detection of *P. gingivalis*.

Topic: Clinical Research: Epidemiology and delivery of care

## P0264

### Effects of self-efficacy on oral health behaviors and gingival health in young people

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<sup>1</sup>Okayama/Japan, <sup>2</sup>Fukuoka/Japan

**Aim:** Although self-efficacy is known to affect various health-related practices, few studies have clearly examined how self-efficacy correlates with oral health behaviors or oral health condition. We examined whether or not self-efficacy affects oral health behaviors and/or gingival health in young people.

**Material and Methods:** A total of 2,111 students (1,197 men, 914 women; non-smoker) aged 18 and 19 years were examined. The degree of gingivitis was expressed as the percentage of bleeding on probing (%BOP). Additional information was collected by the questionnaire regarding oral health behaviors such as daily frequency of tooth-brushing, use of dental floss, and regular dental check-up. The self-efficacy was assessed using the Self-Efficacy Scale for Self-care which consists of 15 items divided into three subscales: self-efficacy for continuing treatment and regular dental check-ups (SE-DC), for brushing of the teeth (SE-BR), and for dietary habits (SE-DH). Path analysis was used to test pathways from self-efficacy to oral health behaviors, and to %BOP.

**Results:** In the final structural model, the three subscales of self-efficacy (SE-DC, SE-BR and SE-DH) were correlated to each other, all of which affected oral health behaviors. Good oral behaviors reduced dental plaque and calculus, and lower levels of dental plaque and calculus affected lower %BOP in young people.

**Conclusion:** The study revealed that higher self-efficacy correlated with better oral health behaviors and gingival health in young people. Improving self-efficacy would be valid for maintaining good gingival health in young population. To prevent gingivitis, the approach of enhancing self-efficacy may be useful in young people.

Topic: Clinical Research: Epidemiology and delivery of care

## P0265

### Gingival recession and dentine hypersensitivity in periodontal patients: Is it affecting their oral health related quality of life?

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Selangor/Malaysia

**Aim:** Gingival recession and dentine hypersensitivity seen in patients have shown to affect quality of life. To date there is little reference on how both conditions affecting the patients. **Aim:** 1. To determine if teeth with gingival recession would have dentine hypersensitivity and to assess their relationship.

2. To evaluate the impact of these conditions on oral health related quality of life physically, psychologically and socially.

**Material and Methods:** A convenient sampling method of 26 periodontal patients with 130 teeth presenting gingival recession buccally were selected for the study. The teeth were tested for dentine hypersensitivity. All patients were then subjected to Modified Oral Health Impact Profile (OHIP-14) questionnaires. The data was analysed with SPSS17.

**Results:** Out of 130 total teeth with gingival recession, 53.08% was positive when tested for dentine hypersensitivity and 46.92% was negative to test. 69.24% of patients perceived that they sometimes experienced pain in the gum while 69.23% also sometimes experienced sensitivity to the teeth. However only 26.92% often felt that the pain on the their teeth was because of the gum receding while the same number of patients never thought so. Both conditions affect their OHRQoL physically and psychologically, however there was no significant difference comparing the social aspects.

**Conclusion:** In half (53.08%) of the 130 teeth with gingival recession, patients showed symptoms of dentine hypersensitivity and that would affect their OHRQoL. Thus it is wise to anticipate problems and provide preventive treatment option for patients with gingival recession to improve their OHRQoL and health care service delivery.

Topic: Clinical Research: Epidemiology and delivery of care

## P0266

### Lower education level as a risk factor for tooth loss in a Swiss population (Krebs-cohort)

F. Rodriguez, R. Weiger, C. Walter  
Basel/Switzerland

**Aim:** To analyse risk factors for tooth loss in females and males in a cohort study in Switzerland.

**Material and Methods:** In a retrospective analysis, the records of patients from the pool of patients at the department were consecutively screened during January 2009 and October 2011. Gender, smoking habits, education, profession and dental variables were recorded. Tooth loss was assessed on full mouth periapical radiographs. Gender logistic regression models were applied in order to predict tooth loss.

**Results:** The sample consisted of 163 participants, 82 women and 81 men, with a mean age of 48.3 in women and 47.7 in men. Tooth loss increased from the front to the molar regions in the lower and in the upper jaw. Age more or equal 50 years ( $p < 0.001$ ), taking medication ( $p < 0.01$ ) and Plaque index more 25% ( $p < 0.01$ ) significantly predict tooth loss in females and males. A significant negative predictive value for tooth loss was obtained with increasing education level. Compared to no school graduation, school graduation without any vocational training ( $p < 0.05$ ), vocational school graduation ( $p < 0.01$ ) and advanced education ( $p < 0.001$ ) show a significantly lower risk for tooth loss in both gender.

**Conclusion:** The results from the present study demonstrate lower education level as a strong risk factor for tooth loss in this Swiss cohort.

Topic: Clinical Research: Epidemiology and delivery of care

**P0267**

### A Questionnaire-based Survey investigating the Interest in Periodontology and Preferences for the Treatment of Localized Gingival Recessions by Dentists in the UK: A Pilot Study

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London/United Kingdom

**Aim:** The aim of the present study was to evaluate, using a questionnaire, the interest and preferences of UK Dentists in 1) identifying lesions associated with periodontal defects in general and gingival recession more specifically and 2) to compare the results with findings from a previous questionnaire study performed by Zaher et al. (2005).

**Material and Methods:** Questionnaires were sent by post to 620 dentists from England, Northern Ireland and Scotland. The questionnaire consisted of 17 questions, which assessed the professional status of the Dentists; knowledge and interest in Periodontology as well as competence in assessing and treating periodontal and recession defects.

**Results:** 184 questionnaires were returned indicating a response rate of 29.6%. Mean age of respondents was 41 years and mean years since graduation was 17 years. 71.4% of the Dentists were General Dental Practitioners and 7% Periodontists. Interest and satisfaction in periodontics appeared to be moderate in nature (VAS: 5-6) whereas interest in periodontics was positively associated with satisfaction.

**Conclusion:** In conclusion it is evident from the present study that traumatic tooth brushing was the most popular reported cause of gingival recession (87.4%) whereas aesthetics proved to be the most significant indication for planning treatment for recession defects (81.9%) followed by Dentine Hypersensitivity (78%). Dentists, however, need to be more informed about recent innovations in techniques using up-to-dated regenerative materials which can be highly efficient in restoring aesthetics in both recession and periodontal defects.

Topic: Clinical Research: Epidemiology and delivery of care

**P0268**

### The role of dental education in improving dental students' periodontal health

S. Aslan, S. Sonmez

Izmir/Turkey

**Aim:** To examine the changes that occur in the oral health awareness and oral hygiene attitudes of dental students between the first and last year of their dental education.

**Material and Methods:** 47 students at the school of dentistry underwent an oral examination and completed a questionnaire including 35 multiple choice questions during their dental training both in the first and fifth academic years. Oral hygiene status was assessed by Plaque Index of Quigley and Hein (PI) and Periodontal Bleeding Index of Saxer and Mühlemann (PBI). The data was analyzed by Mc Nemar-Bowker and Wilcoxon tests.

**Results:** The brushing frequency (64.3 % vs 88.1 %) and the use of dental floss (50 % vs 85.7 %) was higher at the fifth year examination ( $p < 0.05$ ). Percentage of never experiencing halitosis increased at the fifth year ( $p < 0.05$ ). The mean PI score (2.32 vs 1.68) decreased and the mean PBI score (0.490 vs 0.504) increased in the fifth year; but the differences were not statistically significant.

**Conclusion:** A positive attitude and adherence to good oral hygiene behaviours is experienced as the students reach to fifth level of dental education.

Topic: Clinical Research: Epidemiology and delivery of care

**P0269**

### The influence of socio-demographic factors on self-perception of oral health in periodontal patients

A. Lomšek, B. Artnik, R. Gašperšič

Ljubljana/Slovenia

**Aim:** To estimate the association between self-rated oral health (SROH), the General Oral Health Assessment Index (GOHAI) and the severity of periodontal disease, and furthermore to identify socio-demographic factors that might affect the perception of oral health in periodontal patients.

**Material and Methods:** Before clinical examination, consecutive periodontal patients ( $n = 95$ ) answered socio-demographic questions, assessed their SROH on the five-step Likert scale and responded to the 12-item GOHAI questionnaire. The SROH responses were divided into two groups (the poor SROH of the very bad/bad responses; the fair SROH of the average/good/very good responses). Chi-square and Kruskal-Wallis tests were used to compare oral health indicators and socio-demographic factors between the poor and fair SROH groups. Statistically significant factors ( $p < 0.01$ ) were included into a multivariate logistic regression model. Chi-square and Kruskal-Wallis tests were also used to determine the variability of the GOHAI score with the degree of periodontal disease or socio-demographic factors. Additionally, more of these factors ( $p < 0.01$ ) were included into the multivariate linear regression model.

**Results:** Perception of oral health of periodontal patients,

assessed with SROH and GOHAI, was not related to the severity of periodontal disease ( $p>0.01$ ), but was related to the loss of teeth, the need for periodontal treatment, the presence of removable prosthesis, and also to many socio-demographic factors (smoking, personal satisfaction, educational level, social class, employment) ( $p<0.01$ ).

**Conclusion:** Perception of oral health among periodontal patients relates more to the socio-demographic factors than to the severity of periodontal disease.

Topic: Clinical Research: Epidemiology and delivery of care

## P0270

### A study of oral lichen planus in Lithuanian patients

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Vilnius/Lithuania

**Aim:** Oral lichen planus is a common mucocutaneous disease having potential for malignant transformation. The characteristics of oral lichen planus in Lithuanian patients were studied.

**Material and Methods:** Data was collected during 2009–2011 and included information about 79 patients from the Zalgiris Clinic of Vilnius University hospital. The follow-up was from 1 to 8 years. The diagnosis of patients with oral lichen planus was clinically and histopathologically confirmed.

**Results:** There was a statistically higher number of females (88.6%) than males (11.4%). The forms among the oral lichen planus were as follows: 3.8% papular, 44.3% reticular, 36.7% ulcerative-erosive, 1.3% plaque, 12.7% atrophic, and 1.3% bullous type. Most patients presented with multiple affected oral sites. Among all cases, the buccal mucosa was the single most common site of involvement in each form (92.4%), followed by the gingiva (50.6%), tongue (35.4%), floor of the mouth (10.1%), labial mucosa (6.3%) and palate (5.1%). Extraoral manifestations included skin (16.5%), genital areas (5.1%) and nails (3.8%). The most common symptom was roughness (50.6%), followed by pain (36.7%) and burning sensation (31.6%). Of all, four cases (5.1%) developed into squamous cell carcinoma, all patients with ulcerative-erosive type of disease and (10.1%) had family history of lichen planus.

**Conclusion:** Oral lichen planus related with family history. The risk for malignant transformation in a few cases was confirmed.

Topic: Clinical Research: Epidemiology and delivery of care

## P0271

### Health-related quality of life and utility values of patients newly-diagnosed with periodontitis

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**Aim:** To determine baseline health-related quality of life (HRQoL) and utility values of patients diagnosed with

periodontitis using EQ-5D-3L index

**Material and Methods:** Following ethics approval, one hundred and thirty-nine patients newly diagnosed with periodontitis were recruited from five government periodontics clinics over a period of seven months. Diagnosis was based on presence of periodontal pockets at least 4mm deep. Respondents completed a Euroqol EQ-5D-3L questionnaire which includes a visual analogue scale (VAS), recording their self-rated health status on a graduated (0–100) scale. It also includes a description of five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. The UK population weights were used to convert health states to an EQ-5D index score.

**Results:** A total of 107 (77%) of patients were diagnosed with chronic periodontitis while the remaining suffered aggressive periodontitis. EQ-5D scores demonstrated highest proportions for items related to pain/discomfort (55%) and anxiety/depression (33%). Mean VAS score was 68.9 [95% confidence interval: 65.4, 72.4]. Mean EQ-5D utility value was 0.82 [95% confidence interval: 0.79, 0.86]. Higher proportions of pain and anxiety were seen for patients with aggressive periodontitis, with significantly lower quality of life scores using EQ-VAS (t-test,  $P=0.027$ ) as compared to those with chronic periodontitis. Utility values of these patients were also lower than those with chronic periodontitis but the difference was not statistically significant (t-test,  $P=0.082$ ).

**Conclusion:** The use of a generic HRQoL instrument such as the EQ-5D-3L confirms that periodontitis can impact general health states and this suggests promising applications in economic evaluation studies.

Topic: Clinical Research: Epidemiology and delivery of care

## P0272

### Periodontal status and influence of socioeconomic factors among adults in Dalarna County, Sweden. A cross-sectional study.

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**Aim:** The objective of the study was to analyze relationship between periodontal disease and level of education, tobacco habits, marital status and medication in an adult population in the County of Dalarna Sweden.

**Material and Methods:** A cross-sectional study were conducted in 2008 with a random sample of inhabitants ( $n=1800$ ) evenly distributed in the age groups 35-, 50-, 65-, 75- and 85 year of age. The study comprised of a clinical examination including radiographs and a questionnaire. Complete data were obtained from 1158 individuals.

**Results:** The prevalence of advanced periodontitis was 10% and most prevalent in the age group 65. Moderate periodontitis occurred among 17% with highest prevalence in the three highest age groups. Logistic regression analyses revealed that daily smoking was a significant factor for periodontal disease in the age groups 50 and 65. In age group 85, individuals with low education, showed a higher prevalence of advanced periodontitis compared to those with higher education. In individuals above 65 year of age moist snuff use correlated to moderate periodontitis.



**Conclusion:** In conclusion the survey revealed higher prevalence of moderate and advanced periodontitis among smokers in the age groups 50 and 65 and higher prevalence of severe periodontitis among 85 year olds with low education. In individuals above 65 year of age moist snuff use correlated to moderate periodontitis.

Topic: Clinical Research: Epidemiology and delivery of care

## P0273

### Positive Oral Health and Well-being (POHW) in Periodontitis Patients - Preliminary Results

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**Aim:** Questionnaires as the Oral Health Impact Profile (OHIP-14) focus on health deficiencies and their negative consequences on body function, every-day life coping and social contacts. We created a new POHW-17 questionnaire in English, German and Hebrew versions to validate the impact of positive perception of oral health in periodontitis patients visiting one of three dental university centres (Witten, Jerusalem and New York).

**Material and Methods:** The anonymous cross sectional, explorative, multi-centre survey will finally include 200 patients per centre. It uses OHIP-14, BMLSS (Brief Multidimensional Life Satisfaction Scale) and POHW. For a first insight into the factorial structure of the first 70 questionnaires from Witten, we performed reliability (Cronbach's alpha) and explorative factor analysis (principal component analysis using Varimax Rotation with Kaiser normalisation).

**Results:** The preliminary results from 70 questionnaires from Witten are presented here. Male:female ratio was 44:56%; mean age was 57±13 years. So far it looms that four items are to be removed from the questionnaire due to insufficient reliability. The resulting POHW-13 version showed good quality (alpha = .92). The POHW sum-score showed a strong correlation with the subjectively perceived compromised oral health ( $r = -.59$ ;  $p < 0.001$ , Spearman rh), correlated moderately negative with the OHIP ( $r = -.45$ ) and moderately positive with general life satisfaction ( $r = .39$ ), while there was no association to the DMFT-score ( $r = -.01$ ).

**Conclusion:** Further patients have to be recruited for reliable analysis. The preliminary results indicate sufficient quality of the POHW recommending its use in clinical trials for analysing factors which are not available from negatively formulated questionnaires.

Topic: Clinical Research: Epidemiology and delivery of care

## P0274

### Prevalence of Methicillin-Resistant Staphylococcus aureus (MRSA) in the oral cavities of Greek subjects. A pilot study

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**Aim:** To assess the prevalence of the mecA gene (which characterizes MRSA) in periodontally healthy and chronic periodontitis subjects.

**Material and Methods:** The present cross-sectional study included 20 periodontally healthy (mean age 46.8) and 20 chronic periodontitis (mean age 48.9) subjects. Criteria for exclusion were antibiotic intake within the last 4 months, pregnancy, systemic diseases and periodontal treatment within the last 6 months. Inclusion criteria for the periodontally healthy were pocket depths (PD) <3mm, clinical attachment loss (CAL) <4mm and bleeding on probing <15%, while chronic periodontitis cases exhibited at least 6 teeth with PD>5mm, radiographic bone loss>30% and more than 20 teeth present. Ethical committee approval was obtained. The questionnaire included smoking, oral hygiene habits and previous antibiotic intake. A subgingival pooled sample was obtained from the mesiobuccal surface of the first molars, a supragingival one from the tongue and a subgingival pooled sample from the deepest pockets in periodontitis patients. Samples were analyzed with polymerase chain reaction (PCR) for mecA, using primers, controls and conditions described by the European Union Reference Laboratory for antibiotic resistance. Statistical analysis was performed using non-parametric tests.

**Results:** Significant differences were observed between groups concerning clinical parameters (Mann-Whitney test  $p < 0.05$ ). The mecA gene was not detected in either the healthy or the periodontitis group.

**Conclusion:** The small sample size might have prevented detection of the mecA gene indicating that the prevalence is low. Larger sample sizes are needed to assess the prevalence of the medically important pathogen MRSA in the oral cavity.

Topic: Clinical Research: Epidemiology and delivery of care

## P0275

### A pilot study on patient-centred outcomes after routine periodontal and implant surgical procedures.

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Singapore/Singapore

**Aim:** -to compare changes in patient-centred outcomes measured by Visual analogue scores (VAS) between crown lengthening (CL), open flap debridement (OFD) and implant stage 1 surgery (IMP) during the 1-week post-operative period -to report the incidence of post-operative complications

**Material and Methods:** 468 healthy patients were consecutively recruited from the National Dental Centre Singapore. Surgeries performed included CL (n=259), OFD (n=94), IMP (n=115). VAS on bleeding, swelling, pain and bruising were obtained from the patients on days 0 (day of surgery), 3, 5 and 7. Non-parametric Kruskal-Wallis test was used to statistically compare the VAS. All analyses were performed using SAS statistical software, version 9.2. Incidences of post-operative complications at 1 week were reported.

**Results:** On Day 0, IMP gave the lowest median VAS for bleeding (0.00), swelling (1.00), pain (1.00) and bruising (0.00). OFD gave the highest median VAS for bleeding (2.00), swelling (2.07), and bruising (1.09). All VAS decreased to zero with time. Bleeding VAS (Day 0) was significantly lower in IMP ( $p < 0.0001$ ) compared to the others. Swelling, pain and bruising VAS (Day 0, Day 3) were significantly lower in IMP. The drop



in swelling, bruising VAS with time was fastest for CL. The drop in swelling, pain, bruising was slowest for OFD. 85.3% of IMP, 92.0 % of CL, and 85.4% of OFD achieved flap closure. Incidence of tenderness on palpation were 11.6% for IMP, 8.9% for CL, and 12.2% for OFD.

**Conclusion:** The median VAS for all parameters were generally low for all procedures. Low incidences of post-operative complications were reported.

Topic: Clinical Research: Epidemiology and delivery of care

## P0276

### ORAL HEALTH-RELATED QUALITY OF LIFE OF A SELECTED MALAYSIAN ADULT POPULATION

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Kuala Lumpur/Malaysia

**Aim:** To assess Oral health-related quality of life (OHQoL) among the adult population attending the Faculty of Dentistry, University of Malaya and to compare the prevalence of impacts of OHQoL by periodontal status.

**Material and Methods:** This cross-sectional study comprised of fifty subjects selected from the Primary Care Unit, Faculty of Dentistry, University of Malaya. Subjects fulfilling the inclusion/exclusion criteria were selected based on convenient sampling method. OHQoL was assessed using Malaysian version of Oral Health Impact Profile-14 (OHIP-14) which was carried out as an interview administered questionnaire. Basic periodontal examination was performed on all subjects to determine their periodontal status.

**Results:** Psychological discomfort, physical pain and psychological disability domains were the most affected dimensions in this population. Subjects with income levels >RM2,500 had higher impacts on their OHQoL than subjects from other income levels ( $p < 0.05$ ). 78% of the subjects had some form of periodontitis (BPE scores 3, 4 or \*) but only 22% of them had a periodontium that was healthy or with gingivitis (BPE scores 0, 1 or 2). Subjects with periodontal disease experienced higher impacts on OHQoL as compared to healthy/ gingivitis subjects in nearly all domains. Periodontitis subjects demonstrated a higher trend for impacts on their OHQoL as compared to healthy/gingivitis subjects ( $p > 0.05$ ).

**Conclusion:** Income level was significantly associated with OHQoL in these subjects. Periodontitis subjects demonstrated a higher trend for impacts on their OHQoL as compared to healthy/ gingivitis subjects and these impacts come from a wide range of domains.

Topic: Clinical Research: Epidemiology and delivery of care

## P0277

### Oral hygiene practice in Croatian intensive care units

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Zagreb/Croatia

**Aim:** Due to qualitative and quantitative changes of saliva, the

lack of self-cleaning mechanisms and dysfunction of protective reflexes, critically ill patients can develop severe nosocomial infection known as VAP (Ventilator Associated Pneumonia). Appropriate oral hygiene in ICU (Intensive Care Unit) is crucial for prevention of VAP. Aim of this study was to assess the oral hygiene practice of ICU medical staff.

**Material and Methods:** The study was conducted among ICU nursing staff by a survey containing questions divided into two groups: demographical data and oral hygiene practice. The study included 249 members of ICU nursing staff from 14 Croatian hospitals.

**Results:** 94,7% of respondents declared they were familiar with the VAP. Most frequently used oral hygiene agent is gauze soaked in paraffin oil (75,1%). 63,1% of respondents perform oral hygiene measures as recommended by American Association of Critical-Care Nurses (AACN) - brushing and rinsing with chlorhexidine. Most common factors that limit medical staff in the implementation of adequate oral hygiene are: lack of time (47,1%), lack of staff (39,6%) and the lack of resources (36,6%).

**Conclusion:** This study indicates diversity of ICU oral hygiene measures, as well as the relatively weak enforcement of preventive measures recommended by the AACN. Introduction of a standardized written protocol, improved education and increased number of ICU nurses provided with sufficient resources are required for improvement of oral hygiene performed in ICUs.

Topic: Clinical Research: Periodontal Therapy

## P0278

### Effect of platelet-derived growth factor-BB on periodontal healing after tooth reimplantation in dog

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Chiba/Japan

**Aim:** To investigate the effect of PDGF -BB on periodontal healing following tooth reimplantation in dog.

**Material and Methods:** Mandibular third and fourth premolars of 15 healthy female dogs were endodontically treated and then extracted. The coronal portion of each root was carefully scaled and planed. The roots on the right side of the mandible were treated with PDGF-BB and reimplanted, while the roots on the left side served as controls. After 2, 4 or 8 weeks, specimens were collected and processed for histopathological examination.

**Results:** By the 4th week after reimplantation, new PDL-like tissue had formed around the PDGF-BB treated root surfaces and new bone. By the 8th week, healing of the PDGF-BB treated roots was characterized by newly formed periodontal ligament with inserting attachment formation. In contrast, control roots showed multiple areas of replacement resorption. Immunohistochemical staining of proliferating cell nuclear antigen (PCNA) performed at 2 weeks after reimplantation showed that the number of PCNA-positive cells in the connective tissue area was statistically significantly greater in the PDGF-BB treated group than in the control group ( $P < 0.001$ ). The application of PDGF-BB resulted in a significantly lower occurrence and extent of root resorption.

**Conclusion:** These results suggested that the use of PDGF-BB enhances periodontal healing and reduces occurrence of root resorption in tooth reimplantation in this dog model.

## Topic: Clinical Research: Periodontal Therapy

**P0279****Clinical comparison between coronally advanced flap with amniotic membrane or subepithelial connective tissue in treatment of Miller class I and II gingival recessions**A. Lafzi<sup>1</sup>, N. Abolfazli<sup>2</sup>, M. Faramarzi<sup>2</sup>, M. Eivazi<sup>3</sup><sup>1</sup>Tehran/Iran, <sup>2</sup>4113340310/Iran, <sup>3</sup>8317277717/Iran

**Aim:** The aim of the present study was to compare coronally advanced flap with amniotic membrane or connective tissue graft (CTG) in the treatment of Miller's class I and II gingival recessions.

**Material and Methods:** 11 systemically healthy patients, with 30 Miller's class I and II gingival recessions of  $\geq 3$  mm, were selected and randomly divided into two equal groups. Gingival recessions in the control group were treated with coronally advanced flap (CAF) and CTG, and in the test group with CAF and amniotic membrane. The clinical parameters including: probing depth (PD), clinical attachment level (CAL), recession depth (RD), recession width (RW), keratinized tissue width (WKT), were measured (at baseline and 1, 3, and 6 months postoperative).

**Results:** RD, RW, CAL, and MGJ position changed significantly between baseline and 1 month postoperatively ( $p < 0.01$ ) in both groups but remained stable at 3 and 6 month follow ups. There were no statistically significant differences in PD and WKT between baseline and 1, 3, and 6 months postoperatively. The mean root coverage at 6 month period was  $75\% \pm 26\%$  and  $63\% \pm 40\%$  for the control and test groups, respectively. The mean RD reduction of  $2.63 \pm 0.63$  mm and  $2 \pm 1.4$  mm were achieved for the control and test groups respectively.

**Conclusion:** The findings of the present study demonstrated that although use of amniotic membrane resulted in decreasing surgical time and patient morbidity, but superior results were achieved by using CTG.

## Topic: Clinical Research: Periodontal Therapy

**P0280****Single session of antimicrobial photodynamic therapy in association with scaling and root planning for the non-surgical treatment of aggressive periodontitis.**

A.B. Novaes Jr, A.M. Marcaccini, S.L. Souza, F.S. Oliveira

Ribeirao Preto/Brazil

**Aim:** The objective was to evaluate clinical and immunological effects of a single session of antimicrobial photodynamic therapy (aPDT) associated to scaling and root planning (SRP) in aggressive periodontitis (AgP) patients.

**Material and Methods:** Clinical data and levels of inflammatory markers in the gingival crevicular fluid of 18 AgP patients were evaluated after therapy in a split-mouth design. The teeth were randomly treated with SRP or SRP associated with an aPDT. The aPDT was performed in single session associated with SRP with hand instruments. Clinical data of bleeding on probing (BOP), probing pocket depth (PPD), gingival recession (REC) and clinical attachment level were obtained at 0 and 90

days. GCF samples were collected, and the concentrations of MMP-8, IL-8, IL-1 beta and IL-10 were determined by ELISA at baseline, 7-, 30- and 90 days after treatment

**Results:** Both groups demonstrated similar improvements in most parameters over time. Clinical improvement was statistically significant for PPD in both groups ( $p < 0.0001$ ). REC was higher in the SRP group.

**Conclusion:** There was more pronounced improvement of PPD, BOP and suppuration in the association group, suggesting a potential clinical effect of aPDT combined with SRP. However, a single session of the aPDT associated with SRP was not enough to modify the parameters observed with SRP. Sponsored: CNPq, FAPESP 2008/06399-4 and Helbo Photodynamics

## Topic: Clinical Research: Periodontal Therapy

**P0283****Effect of ozone on the viability of fibroblasts in vitro**

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Dresden/Germany

**Aim:** Bactericidal effects of Ozone are already used in dentistry. Another application could be in periodontitis therapy. The aim of this in vitro study was to investigate whether ozone damages periodontal fibroblasts and if yes under which circumstances.

**Material and Methods:** Periodontal fibroblasts were harvested from extracted third molars. The cells were incubated at  $37^\circ\text{C}$  for 21 days. Three cell preparations with a high proliferative capacity were used. 10,000 fibroblasts were cultured per well and incubated for 5 days. For experiments under dry conditions the culture medium was removed for 60s. Ozone was applied for 0, 20s, 40s, 60s. For tests under wet conditions 100  $\mu\text{l}$ , 30  $\mu\text{l}$ , 20  $\mu\text{l}$ , 10  $\mu\text{l}$  culture medium were applied on the cells. Ozone application lasted 120s and 60s. After 24 hrs storage, the cell viability was determined using the lactate dehydrogenase test. Each experiment was repeated three times. The effect of ozone was calculated (ANOVA, post hoc Tukey tests,  $p < 0.05$ ).

**Results:** 95.9% of fibroblasts exposed to dry conditions survived. After ozone application of 20s, the number of fibroblasts was reduced to 52.1%, after 40s to 30.8%, and after 60s to 11.8%. The differences between the groups were statistically significant. Under wet conditions no ozone effect was seen. Viability of fibroblasts was on average 95%. Compared to the reference groups no statistically significant difference was observed.

**Conclusion:** Ozone kills periodontal fibroblasts in vitro when the cells are exposed to a dry environment. As long as the fibroblasts are covered in a culture medium no negative effect is observed.

## Topic: Clinical Research: Periodontal Therapy

**P0284****Results of full-mouth disinfection in aggressive and chronic periodontitis**

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Frankfurt/Germany

**Aim:** Analysing factors influencing treatment results in aggressive (AgP) and chronic (ChP) periodontitis.

**Material and Methods:** Methods: ChP (probing depth [PD]  $\geq 3.5$  mm, attachment loss  $\geq 5$  mm at  $> 30\%$  of sites; age  $> 35$  years) and AgP (clinically healthy; PD  $\geq 3.5$  mm at  $> 30\%$  of sites, radiographic bone loss  $\geq 50\%$  at 2 teeth; age  $\geq 35$  years) were examined prior and 3 months after nonsurgical therapy.

**Results:** In 31 ChP (12 female, 10 smokers; 4,808 sites) and 28 AgP (16 female, 9 smokers; 4,769 sites) PD reductions and PAL-V gain were more favorable at sites with initial PD  $\geq 6$  mm, BOP, and for adjunctive systemic antibiotics. Further, PD reductions were more favorable for increased baseline tooth mobility and maxillary teeth, whereas, AgP, female sex, and multi rooted teeth were associated with less favorable PD reduction.

**Conclusion:** Regarding PD reduction AgP responded less favorably to nonsurgical treatment than ChP. This study was supported by the German Society for Periodontology (DGP), the German Society of Dental, Oral, and Maxillofacial Medicine (DGZMK), and by a DGP DIU Master of Periodontology and Implant Therapy scholarship donated by Nobel Biocare Germany.

Topic: Clinical Research: Periodontal Therapy

P0285

### The Influence of Periodontal Dressing on Clinical Results after Scaling and Root Planing

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**Aim:** The aim of this prospective clinical study was to compare the clinical results after scaling and root planing (SRP) with and without periodontal dressing.

**Material and Methods:** 28 volunteers (mean age  $50.6 \pm 10.5$  years) with moderate chronic periodontitis were treated by full-mouth SRP. In a randomised split-mouth design a periodontal dressing was applied in the test area for 3 days. A CHX-mouthrinse was used in both groups for two weeks. Attachment level (AL), probing depth (PD), bleeding on probing (BOP) were recorded at baseline before the SRP (0) as well as after 6(1) and 12(2) weeks. The Mann-Whitney U- and the Friedman/Wilcoxon tests were used for statistical analysis.

**Results:** The baseline conditions were equally for test- and control-sites. Clinical variables were significantly improved after 6 and 12 weeks in both groups. E.g., in the test group AL (mm, 0-2) was improved from  $3.6 \pm 0.7$  to  $3.0 \pm 0.7$  ( $p < 0.001$ ), in the control group AL decreased from  $3.6 \pm 1.0$  to  $3.1 \pm 1.0$  ( $p < 0.001$ ). PD (mm, 0-2) decreased significantly from  $3.3 \pm 0.4$  to  $2.8 \pm 0.4$  ( $p < 0.001$ ) in the test group, in the control group from  $3.3 \pm 0.4$  to  $2.8 \pm 0.4$  ( $p < 0.001$ ). In the test group BOP (% , 0-2) decreased from  $34.8 \pm 19.3$  to  $10.0 \pm 12$  ( $p < 0.001$ ) and in the control group from  $30.2 \pm 17.2$  to  $11.7 \pm 13.5$  ( $p < 0.001$ ). There were no significant differences between the groups at any time.

**Conclusion:** The application of a periodontal dressing does not influence the clinical outcome after SRP.

Topic: Clinical Research: Periodontal Therapy

P0287

### Effects of L-ascorbic acid 2-phosphate magnesium salt on gingivitis: a blinded, randomized-control clinical trial

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**Aim:** To determine the effect of L-ascorbic acid 2-phosphate magnesium salt (APM), a long-acting ascorbic acid derivative with antioxidant properties, on gingival inflammation and salivary antioxidant status.

**Material and Methods:** The clinical effects of AMP added to a toothpaste were investigated in a randomized, parallel-group, controlled clinical trial comprising 300 individuals with gingivitis at four dental facilities. Clinical scores including gingival index (GI) and the total antioxidant activity of saliva (TAO) measured as the ferric reduction ability of plasma (FRAP) were assessed at baseline and after one and three months of using the toothpaste.

**Results:** An intent-to-treat analysis showed that GI scores did not significantly differ between groups given the APM or a control toothpaste at three months ( $p = 0.1217$ ). However, a per-protocol analysis that excluded patients who had received treatment that affected gingival inflammation such as antibacterial agents, found a significantly lower GI score in the APM group at three months ( $p = 0.0128$ ). The FRAP score in saliva was also significantly higher in the APM group at that time ( $p = 0.0280$ ).

**Conclusion:** These findings indicated that APM could reduce gingival inflammation. Moreover, since APM ameliorated salivary TAO, antioxidant activity might have played an important role in improving gingival inflammation.

Topic: Clinical Research: Periodontal Therapy

P0288

### Application of osteotropic materials for the treatment of periodontal disease in patients with chronic periodontitis.

G. Runova, E. Vibornaya

Moscow/Russian Federation

**Aim:** To determine the timing of bone tissue regeneration of patients with chronic periodontitis after surgical treatment with the use of osteoplastic materials in combination with the platelet plasma by means of x-rays.

**Material and Methods:** Clinical efficacy of the material was evaluated at different surgical procedures on the periodontal tissues, whose purpose was to restore the bone pockets in patients with chronic periodontitis. At the clinic of our department of "Moscow State University of Medicine and Dentistry" 47 patients were operated with varying degrees of severity. The aim of our

study was to determine the timing of bone tissue regeneration after filling of postoperative defects jawbone material Easy Graft by means of X-ray.

**Results:** X-ray examination was conducted in patients after surgery 2, 6 and 12 months. Within 2 months after surgery the growth of bone tissue was found, mainly in the periphery, and the center of the defect structure of the bone was not uniform, with numerous inclusions of bone density. 6 months after surgery on the radiograph clearly traced completely restored bone tissue.

**Conclusion:** Thus, the new osteoplastic material Easy Graft can be recommended for use in the recovery of bone defects in dental surgery.

## Topic: Clinical Research: Periodontal Therapy

### P0289

#### Effect of angiogenic growth factor of platelet plasma on recovery of microcirculation in periodontal tissues after surgical treatment of patients with chronic periodontitis

G. Runova, E. Vaitsner, I. Abalakina

Moscow/Russian Federation

**Aim:** To assess changes in the microcirculation of the periodontal tissues of the patients with chronic periodontitis after surgical treatment using growth factors of platelet plasma.

**Material and Methods:** Laser Doppler Flowmetry (LDF) to assess blood flow. LDF is implemented using a laser analyzer of capillary blood flow - LACK-02. At Visual Computer microangiography gums (VCM) are visually observed as well as the capillaries, their size, shape, flow of blood in them. The linear velocity of blood flow is counted either. We examined 36 people in age from 18 to 55 with chronic generalized severe periodontitis before treatment and after surgery using the combination of xenogenic hydroxyapatite and platelet plasma (group 1), using the platelet plasma (group 2) and using only the xenogenic hydroxyapatite (group 3). The control group consisted of students with intact periodontium (10 people).

**Results:** The Studies have revealed that the patients with chronic generalized severe periodontitis have capillary blood flow rate at 3-4 times higher than in the control group. This is the evidence of the significant stagnation in the blood supply of the periodontium. After 3 months in the group 1 of patients their was reduction of capillary blood flow by 61%; in the group 2 of patients by 60%. In the group 3 the level of capillary blood flow decreased by 50%. The results were appropriate to the state of microcirculation in the control group and were associated with the reduction of inflammation in the periodontal tissues and with the absence of stagnation.

**Conclusion:** Our results confirm the effectiveness of combination of platelet plasma and xenogenic hydroxyapatite in treatment of chronic periodontitis for recovery microcirculation in periodontal tissues.

## Topic: Clinical Research: Periodontal Therapy

### P0290

#### Enoxaparin to treat Recurrent Aphthous stomatitis: an Exploratory Clinical Trial

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**Aim:** : Low molecular weight derivatives of heparin have been recently suggested for the treatment of different diseases including oral lichen planus (OLP) due to their effectiveness and limited side effects. However, no studies have concerned the effectiveness of these agents in the treatment of recurrent aphthous stomatitis (RAS). The present study then aimed to assess this effectiveness in vivo.

**Material and Methods:** Included were 30 RAS patients consecutively referred to our centers without any systemic diseases. The ulcers were examined in terms of size and number. Recurrence intervals were recorded by the patients. 1 U/0.002 ml Enoxaparin was injected subcutaneously (3 mg). Injections were repeated once a week for 8 weeks. The patients were followed monthly for three months. To determine the level of pain, Visual Analogue Scale (VAS) from 0 to 10 was used. The data were statistically analyzed to determine the difference between the number, size, and pain using Wilcoxon test.

**Results:** It was shown that 8-stage injection of Enoxaparin is associated with significantly reduced number, size, recurrence intervals, and the intensity and duration of pain of the lesions in 21 males (70%) and 9 females (30%) of the present study.

**Conclusion:** According to the limitations of the present study, systemic Enoxaparin seems successful in reducing the number, size, recurrence frequency and the duration of pain and discomfort in RAS patients without significant side effects

## Topic: Clinical Research: Periodontal Therapy

### P0291

#### The use of enamel proteins and bovine porous bone mineral in the treatment of infrabony defects

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**Aim:** The purpose of this study was to compare the clinical effectiveness of Enamel Matrix Proteins (EMPs) used alone or in combination with Bovine Porous Bone Mineral (BPBM) in the treatment of periodontal infrabony defects

**Material and Methods:** 21-paired defects were surgically treated using a split mouth design. Infrabony defects were treated either with EMPs (EMPs group) or with EMPs combined with BPBM (EMPs/BPBM group). Re-entry surgeries were performed after 6 months

**Results:** The EMPs/BPBM group presented with significantly more attachment gain than the EMPs group. Surgical re-entry of the treated defects revealed a significantly greater amount of defect fill in favour of the EMPs/BPBM group as compared to the EMPs group



**Conclusion:** The results of this study indicate that BPBM has the ability to augment the effect of EMPs in reducing pocket depth, improving clinical attachment levels and promoting defect fill when compared to pre-surgi-cal levels

Topic: Clinical Research: Periodontal Therapy

## P0292

### Combination use of bone materials, enamel matrix proteins and membrane in therapy of infrabony defects

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**Aim:** The purpose of this study was to evaluate the effectiveness of a combination of enamel matrix proteins (EMP), bovine porous bone mineral (BPBM), and a bioabsorbable membrane for guided tissue regeneration (GTR) as regenerative therapy for intrabony defects in humans and compare it to an open flap debridement (OFD) technique

**Material and Methods:** 36 intrabony defects were treated with surgical procedure. Experimental sites were treated with EMP, grafted with BPBM, and received a collagen/polylactic acid membrane for GTR. Control sites were treated with OFD. The primary outcomes evaluated in the study included probing depth resolution, clinical attachment gain, and bony defect fill

**Results:** Postsurgical measurements taken at 6 months revealed a significantly greater reduction in probing depth in the experimental group ( $4.95 \pm 1.52$ ) when compared to the control group ( $2.83 \pm 0.83$  mm). The experimental sites also presented with significantly more attachment gain ( $3.89 \pm 1.16$  mm on buccal sites and  $3.78 \pm 1.14$  mm on lingual sites) than the control sites ( $1.52 \pm 0.83$  mm on buccal sites and  $1.48 \pm 0.78$  mm on lingual sites)

**Conclusion:** The results of this study indicate that a combination technique including BPBM, EMP, and GTR results in better clinical resolution of intrabony defects than treatment with OFD

Topic: Clinical Research: Periodontal Therapy

## P0293

### Enamel matrix protein adsorption to root surfaces in the presence or absence of human blood

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**Aim:** The clinical use of an enamel matrix derivative (EMD) has been shown to promote periodontal regeneration. At the time being it is unknown to what extent the bleeding during periodontal surgery may compete with EMD adsorption to root surfaces. The aim of this study was to evaluate the effect of blood interactions on EMD adsorption to root surfaces mimicking various clinical settings and to test their ability to influence human periodontal ligament (PDL) cell attachment and proliferation.

**Material and Methods:** Teeth extracted for orthodontic reasons were subjected to ex vivo scaling and root planing, treated with 24% ethylenediaminetetraacetic acid (EDTA), EMD and/or human blood in 6 clinically related settings to determine the ability for EMD to adsorb to root surfaces. Surfaces were analyzed for protein adsorption via scanning electron microscopy and immunohistochemical staining with an anti-EMD antibody. Primary human PDL cells were seeded on root surfaces and quantified for cell attachment and cell proliferation.

**Results:** Plasma proteins from blood samples altered the ability for EMD to adsorb to root surfaces on human teeth. Samples coated with EMD lacking blood demonstrated a consistent even layer of EMD adsorption to the root surface. In vitro experiments with PDL cells demonstrated improved cell attachment and proliferation in all samples coated with EMD (irrespective of EDTA) when compared to samples containing human blood.

**Conclusion:** Based on these findings, it is advised to minimize blood interactions during periodontal surgeries in order to allow better adsorption of EMD to root surfaces.

Topic: Clinical Research: Periodontal Therapy

## P0294

### Interdisciplinary approach to rehabilitation chronic periodontitis

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**Aim:** Chronic periodontitis (CP-Chronic periodontitis) is the most common periodontal inflammation.

The progress of CP is different. It depends on the activities of local irritation and tissue resistance. Prognosis in most cases depends on the control and prevention of etiologic factors.

The number and distribution of remaining teeth is an important factor in determining prognosis, because occlusal forces must be properly spaced to prevent further deterioration of periodontal gum.

**Material and Methods:** The patient (50 years old) from the case report is orthodontic patient for years (periodontal patient occasionally). Orthodontic treatment has been completed and the patient wears splint at night to maintain the status quo. The patient noticed movement 25 (3) and states that she often bites the cheek mucosa (on that side).

#### METHODS:

Treatment plan:

1. Instructions in oral hygiene and taking the index (RVG 24.25)
2. Initial Therapy
3. Selective grinding (study model)
4. Setting ribbon strips 24-26
5. A modified flap operation (Kirkland flap)
6. Control after 1 month, 3 months, 6 months

Orthodontist is familiar with the treatment plan and supports it with regular controls.

**Results:** RVG indicates that there has been the creation of new

spongiosis, crista alveolaris interdental septum is much closer to the enamel-dentin juncture (bone tissue is constantly in the process of remodeling).

**Conclusion:** The patient is no longer biting cheek mucosa after selective grinding and goes for regular orthodontist check-ups. Orthodontist is satisfied with improvement and proposes termination of wearing the splint. View of this case demonstrates that with an interdisciplinary approach and a motivated patient success is inevitable.

## Topic: Clinical Research: Periodontal Therapy

### P0295

#### The effect of nonsurgical periodontal therapy on the level of HNP 1-3 in GCF in aggressive periodontitis patients.

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**Aim:** Aggressive periodontitis (AP) is frequently associated with the specific periodontal pathogens and neutrophil function abnormalities.  $\alpha$ -defensins (HNP 1-3) belong to the azurophilic granules of neutrophils and play important role in innate immunity. The aim of the study was to assess the presence of  $\alpha$ -defensins in the GCF in AP patients before and after nonsurgical periodontal therapy.

**Material and Methods:** Twenty generally healthy patients with AP were included in the study. Prior to therapy, 3 and 6 months post treatment, each patient underwent periodontal examination with a PCPUNC 15 probe to determine PPD, GR, CAL, PI and BOP as well as GCF collection from the pocket (PPD  $\geq$  4mm) chosen on the first visit. Sulcus fluid flow rate (SFFR) was determined in relative Periotron-units. The level of HNP 1-3 in GCF was determined by means of a commercially available ELISA kit. All the patients received periodontal treatment involving SRP with additional systemic antibiotic therapy (Amoxicillin 3x 375 mg/d + Metronidazole 3 x 250 mg/d for 7 days).

**Results:** The periodontal therapy caused a statistically significant decrease in all the clinical parameters studied at the sites of sample collection. The level of  $\alpha$ -defensins per measure point did not show statistically significant changes. SFFR showed statistically significant decrease.

**Conclusion:** The study did not show changes in the overall amount of  $\alpha$ -defensins in GCF after SRP using additional systemic antibiotic therapy in aggressive periodontitis patients. The collected evidence is difficult to interpret and therefore further studies are needed to fully elucidate the role of HNP1-3 in aggressive periodontal diseases.

## Topic: Clinical Research: Periodontal Therapy

### P0296

#### Evaluation of adjunct effect of the antimicrobial photodynamic therapy to scaling and root planning in smokers. A controlled clinical study.

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Ribeirao Preto/Brazil

**Aim:** This study evaluated the adjunct effect of antimicrobial photodynamic therapy (aPDT) associated to scaling and root planing in smokers with chronic periodontal disease (CPD), in a split-mouth model, analyzing clinical and laboratorial parameters.

**Material and Methods:** Twenty smokers (10 or more cigars/day for at least 5 years) with CPD and at least 20 teeth, without systemic diseases and presenting contralateral teeth with bleeding on probing and probing depth  $\geq$  5 mm, were selected. Each tooth of the pair was randomly assigned to Control Group (CG), which received scaling and root planing (SRP), or Test Group (TG), which received SRP + aPDT. Clinical parameters of plaque index (PI), bleeding on probing (BOP), probing depth (PD), relative attachment level (RAL) and gingival recession (GR) were recorded at baseline, 1 week, 30 days and 3 months after periodontal treatment, at the deepest site of each tooth. In these periods of time, gingival crevicular fluid (GCF) was also collected for quantification of Interleukin 1-beta and Metalloproteinase-8, using ELISA test.

**Results:** Baseline values for PI, BOP, PD, GR and RAL were not different between groups ( $p > 0.05$ ). There was a significant PD reduction and RAL gain for both groups ( $p < 0.05$ ). Differences between groups were not statistically significant for any clinical parameter ( $p > 0.05$ ). Regarding cytokines, TG presented lower concentration of IL-1 $\beta$  at 1-week evaluation ( $p = 0.019$ ) and of MMP-8 at 3-month evaluation ( $p = 0.036$ ).

**Conclusion:** aPDT was able to decrease GCF levels of IL-1b immediately after SRP and of MMP-8 after 3 months, suggesting that aPDT may favor periodontal healing in smokers.

## Topic: Clinical Research: Periodontal Therapy

### P0297

#### Evaluation of clinical and microbiological parameters in the treatment of chronic periodontitis: scaling and root planing vs scaling and root planing + Nd:YAG laser.

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**Aim:** The aim of this study was to assess the clinical outcome of SRP alone or combined with Nd:YAG laser therapy, in chronic periodontitis.

**Material and Methods:** It was a double blind split mouth design study, involving patients with generalized chronic periodontitis. A quadrant was submitted to SRP and Nd:YAG laser (test) while other quadrant was only subject to SRP alone (control). The clinical parameters recorded were Plaque Index, Bleeding on Probing Index, Probing Depth, Attachment Loss and Gingival Recession. The bacteria tested by real-time PCR were: *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis* and *Prevotella intermedia*. Clinical measurements and microbiological samples were taken, at baseline and 40 days after treatment.

**Results:** An obvious clinical and microbiological improvement was found in both groups. BOP index and probing depth decreased in the test and control group. In our study, we found a gain of clinical attachment of 1,04mm in SRP group and 0,61mm in Nd:YAG group. A microbiological analysis indicated significant decreases in *Porphyromonas gingivalis*,

Prevotella intermedia and Aggregatibacter actinomycetemcomitans in the Nd:YAG and SRP group. However, no significant group differences, could be detected for the clinical and microbiological parameters analysed; except for PD, it was the only parameter that revealed statistically differences in the mean values after treatment, with advantage for SRP group (3,49 mm) comparatively to laser group (4,07 mm).

**Conclusion:** Our data suggest that scaling and root planing alone or with adjunctive Nd:YAG laser showed significant improvements regarding clinical and microbiological parameters, but no significant difference was observed between the 2 groups, except for probing depth.

Topic: Clinical Research: Periodontal Therapy

**P0298**

### The effect of individual stress coping strategies on supportive periodontal therapy - A follow-up over a period of 10 years

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**Aim:** The purpose of this study was to investigate the effect of different stress coping strategies on the success of periodontal maintenance therapy over a period of 10 years.

**Material and Methods:** At 59 patients mean clinical attachment loss (CAL) as well as number and frequency of teeth were measured over 2, 5 and 10 years. Changes in mean CAL over treatment period were measured using repeated measures ANOVA. Associations between the clinical parameters and stress coping groups were tested by Pearson's correlation coefficient.

**Results:** Periodontal treatment resulted in a significant decrease of mean CAL after 2 years. From that point up the level of mean CAL remained constant. The data analyses showed a significant correlation between defensive coping style and the number of teeth with CAL of more than 6 mm after 2 years, but no further correlations was found between coping styles and CAL for the maintenance period.

**Conclusion:** As periodontal treatment was less efficient over 2 years in patients who were coping with a more defensive style, supportive periodontal therapy seems to have more beneficial effects on clinical parameters in that patient group subsequently. Thus controlled maintenance programs seem to result in removal of inequalities in disease progression between patients threatened by individual inadequate coping styles. Further studies investigating the effect of various coping strategies on the long-term outcome of periodontal treatment in a more comprehensive study population are desirable.

Topic: Clinical Research: Periodontal Therapy

**P0299**

### Utility of air polishing devices in non-surgical periodontal treatment – a systematic review

J. Bühler, R. Weiger, C. Walter  
Basel/Switzerland

**Aim:** Instrumentation of the root surface, using curettes or ultrasonics, in supportive periodontal treatment may cause adverse effects. The aim of the present systematic review was to analyze the utility of potentially less invasive air polishing devices in clinical studies in humans.

**Material and Methods:** A MEDLINE search was performed for publications published by November 2011 using suitable validated keywords; this search was complemented by a manual search. The study selection, data preparation and validity assessment were conducted by two reviewers.

**Results:** Out of the 399 abstracts screened, thirteen studies were included in the analysis. Different air polishing devices based on Sodium bicarbonate or Glycine were used in different settings. A deterioration of the periodontal tissues, including removal of cementum and increased gingival erosion was reported for Sodium bicarbonate use. No major adverse effects were reported for Glycine based devices. Data from short term clinical studies show similar results regarding subgingival biofilm removal or probing pocket depth reduction. In addition, patient satisfaction after non-surgical therapy was significantly greater using Glycine based devices compared to conventional instrumentation of the root surface.

**Conclusion:** Air-polishing devices based on Glycine may be an alternative for supportive periodontal treatment. Further evidence with respect to long term clinical outcome parameters is required.

Topic: Clinical Research: Periodontal Therapy

**P0300**

### Non-contact biofilm removal - a reality? A systematic analysis of in vitro studies on sonic toothbrushes

J. Schmidt, R. Weiger, C. Walter  
Basel/Switzerland

**Aim:** Powered toothbrushes have been developed to facilitate oral hygiene and to improve efficacy in difficult to access areas. The aim of the present review was to evaluate the current evidence regarding the efficacy of sonic toothbrushes in non-contact biofilm removal in in vitro studies.

**Material and Methods:** In vitro studies published by July 2011 were systematically screened using the MEDLINE database, complemented by a manual search. The studies subjected for inclusion were examined by two reviewers.

**Results:** A total of three articles from the electronic search of the MEDLINE database were included. Thirteen additional publications were identified by screening the references of the studies evaluated for inclusion. The finally included 16 studies represent data from seven different sonic toothbrushes. A great heterogeneity was observed regarding biofilm models and brushing protocols. Non-contact biofilm removal exceeds 50% in most of the analysed papers. Hydrodynamic phenomena in terms of shear forces, air bubbles and acoustic pressure waves were discussed to cause reduction of the biofilm.

**Conclusion:** Hydrodynamic effects of some sonic toothbrushes may lead to a non-contact biofilm reduction in vitro. Sonic toothbrushes may have the potential to improve self-performed oral hygiene.

## Topic: Clinical Research: Periodontal Therapy

**P0301****Comparison of variations and the dimensional stability of periodontal tissues following surgical crown lengthening between traditional techniques and perio surgery: a 6-month clinical study**

G. Cristofaro, B. Rossi, R. Pignatelli, A. D'Addona

Rome/Italy

**Aim:** Evaluate the variations and the dimensional stability of periodontal tissues following surgical crown lengthening and over a 6-month healing period between traditional techniques and perio surgery

**Material and Methods:** 13 Teeth were submitted to surgical crown lengthening. Following parameters were evaluated: plaque and gingival index, probing depth, free gingival margin, attachment level, interproximal bone level and direct bone level before and after osseous resective procedure. To obtain these parameters an acrylic stent was used with a fixed reference point, vertical grooves to standardize probe placement and a superior guide to standardize the placement of the x-ray positioning training module. Reexamination 7, 30, 45, 90, 180 days postoperatively

**Results:** All the patients completed the study. No significant change in probing depth ( $0.15 \pm 0.12$  mm). After surgery PGM (position of gingival margin) was apically displaced ( $2.24 \pm 0.44$  mm), after 6 months there was a rebound of  $0.82 \pm 0.28$  mm (mean). At 56% of treated sites  $\geq 2$  mm of bone was removed. Following analysis of the periapical X-ray, the variations in interproximal bone dimension from bone resection to 6 months was  $0.86 \pm 0.92$  mm. **COMPARISON BETWEEN TRADITIONAL TECHNIQUE AND PIEZO SURGERY:** In two cases was used Piezo Surgery. These cases were compared with 2 traditional cases with t-test. The results had shown no differences in CAL, PD and PGM after 6 months. Differences only for the variations in interproximal bone dimension with an increase of apical displacement with the Piezo Surgery technique after 6 months (Mean  $1.32 \pm 0.34$ )

**Conclusion:** The results demonstrated progressive coronal displacement of gingival margin for both techniques. The bone level obtained by osseous resective tend to be apical displaced with Piezo Surgery. This is a preliminary study. The increase of cases will give us more definite answers.

## Topic: Clinical Research: Periodontal Therapy

**P0302****Clinical Effectiveness of Platelet-Rich Fibrin and Anorganic Bovine Bone Mineral in the Treatment of Intrabony Defects**

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Istanbul/Turkey

**Aim:** INTRODUCTION: Periodontal therapy with the combination of platelet concentrates and different grafting materials is becoming an ultimate goal of the regeneration of soft and hard tissues. Platelet-rich fibrin (PRF) is an immune

and platelet concentrate. It collects all the constituents of a blood sample favorable to healing and immunity. **Aim:** The aim of this clinical study is to evaluate the healing of intrabony defects treated with PRF + xenograft materials.

**Material and Methods:** 16 intrabony defects were selected each having intrabony component  $\geq 3$  mm. In test group, 8 defects were treated with PRF + ABBM graft and PRF membrane. Control group was treated with ABBM graft and PRF membrane. Plaque index (PI), gingival index (GI), probing depth (PD), clinical attachment level (CAL), gingival marginal level (GML) and transgingival bone level (TGBL) were measured at baseline and 6 months post-surgery. Clinical parameters recorded with using customized acrylic stents with grooves to ensure a reproducible placement of periodontal probe.

**Results:** Reduction in the PI and GI were statistically significant in both groups at 6 months postoperatively. The difference between the groups was statistically insignificant. Both groups presented with a significant greater PD and CAL reduction at 6 months. Test sites presented with a significantly greater CAL gain than control sites. Gingival recession was similar in the two groups. Reduction in the TGBL was statistically significant in both groups at 6 months. The difference between the groups was statistically insignificant.

**Conclusion:** The two therapies tested seemed to be effective in the treatment of intrabony defects. Further studies using a larger sample size are necessary to confirm the results.

## Topic: Clinical Research: Periodontal Therapy

**P0303****Study on novel tissue regenerative therapy using bone marrow-derived mesenchymal stem cells and FGF/collagen complex**

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Nagano/Japan

**Aim:** The aim of this study was to evaluate the kinetics of bone marrow-derived mesenchymal stem cells cultured in a FGF-collagen complex as a regenerative scaffold in vitro.

**Material and Methods:** The cells ( $6.0 \times 10^4$  cells/mL) were seeded into the collagen gel culture plate. After confirming collagen gel formation, 0.5 mL of growth medium containing the specified concentration of FGF was added gently. The plate was incubated in 5% CO<sub>2</sub> at 37°C for up to 21 days. FGF was added to culture medium to obtain final concentrations of 1, 10 and 100 ng/mL. Quantitative measurements of Calcium and DNA concentrations and ALP activity were performed using a commercial kit.

**Results:** Cells showed good growth in the collagen gel culture. The effect of FGF in promoting cell growth is exhibited at the early stage of culture. The ALP activity has already passed the peak when assayed at 21 days culture at FGF concentrations of 10 ng and 100 ng. The ALP activity decreased in the presence of FGF in a dose-dependent manner at 21 days.

**Conclusion:** The present study sheds light on the development of an optimal biomaterial that forms the basis of calcified hard tissue formation, suggesting the feasibility of applying the 3-D collagen gel cell culture system for the construction of a scaffold that controls the amount of regenerating tissue.



## Topic: Clinical Research: Periodontal Therapy

## P0304

**The effect of Conical and Cylindrical interdental brushes – A randomized clinical trial –**

H.C. Larsen<sup>1</sup>, D.E. Slot<sup>2</sup>, C. Van Zoelen<sup>1</sup>, D.S. Barendregt<sup>1</sup>, F. Van Der Weijden<sup>2</sup>

<sup>1</sup>Rotterdam/Netherlands, <sup>2</sup>Amsterdam/Netherlands

**Aim:** The purpose of the study was to evaluate the effect of conical and cylindrical shaped IDB on approximal plaque scores and bleeding upon pocket probing (BOPP).

**Material and Methods:** In total 60 periodontal maintenance patients volunteered to participate in this parallel randomized controlled examiner blind study. They were selected from those consulting the Clinic for Periodontology in Rotterdam, the Netherlands. The subjects regularly visited the clinic with 3 monthly intervals. At baseline a plaque and BOPP assessment was performed. The type of IDB (conical or cylindrical) was randomly assigned and individually instructed to the volunteers. After 3 months the same parameters as at baseline were assessed.

**Results:** In total 52 subjects completed all the clinical assessments appointments. No significant difference were observed for the approximal plaque and bleeding scores at any time between the two types of IDB. The impact of a personalized reinstruction of IDB was evident in plaque score at the 3 months assessment. A 4 – 10% reduction in plaque scores was observed. For bleeding scores there was a 2 – 4% difference between groups at baseline and 3 months. This difference was not significant.

**Conclusion:** Within the limitations of this experiment there appears to be no difference between conical and cylindrical IDB with respect to approximal plaque removal.

## Topic: Clinical Research: Periodontal Therapy

## P0305

**Efficacy of adjunctive subantimicrobial dose doxycycline in diabetic patients – randomized study**

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**Aim:** Diabetes mellitus is one of the risk factors for periodontitis. Since collagenase production is often elevated in diabetic patients, Subantimicrobial dose doxycycline (SDD) is a logical choice for study. This study was designed to investigate the effectiveness of adjunctive SDD treatment in patients with type 2 diabetes mellitus and chronic periodontitis (CP).

**Material and Methods:** 34 patients with CP and type 2 diabetes mellitus were included in the study. After scaling and root planing (SRP) patients were randomly assigned to two groups, receiving either SDD or placebo bid for 3 months. The probing depth (PD), clinical attachment level (CAL), bleeding on probing (BOP) approximal plaque index (API), glycated hemoglobin (HbA1c) level were recorded and GCF (gingival crevicular fluid) samples were collected at baseline and after three months therapy.

**Results:** CAL and PD improved significantly ( $P < 0.05$ ) in both groups after the therapy. SRP+SDD group demonstrated greater clinical improvements but significant ( $P < 0.05$ ) difference between the two groups was observed only in probing depth in tooth sites with initial  $PD \geq 4$  mm (SRT:  $3.41 \pm 0.6$  mm vs. SRP+SDD:  $2.92 \pm 0.5$  mm). GCF matrix metalloproteinase-8 levels were significantly reduced only in SRP+SDD group. There were no changes in the HbA1c levels after therapy.

**Conclusion:** Efficacy of nonsurgical periodontal therapy in diabetes mellitus patients is more effective when combined with subantimicrobial dose doxycycline. SDD therapy was effective in reducing MMP-8 levels and also in improving clinical measurements at tooth sites with severe disease ( $PD \geq 4$  mm).

## Topic: Clinical Research: Periodontal Therapy

## P0306

**Effects of Near-Infrared LED Treatment on Experimental Periodontitis**

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<sup>1</sup>Singapore/Singapore, <sup>2</sup>Taipei/Taiwan

**Aim:** The purpose of this study was to evaluate the histologic change of experimental periodontitis under near-infrared LED treatment.

**Material and Methods:** 96 Sprague-Dawley rats were utilized. The experimental periodontitis was induced by submerging the silk ligature in the sulcus of maxillary molars for 14 days, and half of animals received inter-papillary P. gingivalis LPS injection twice a week. LED emitters were inserted intraorally after local debridement of the periodontal sockets. The dosage of irradiation was 0, 5 (low-dose), 10 (medium-dose), and 15 (high-dose) joules respectively. Animals were euthanized after 3, 7, and 14 days of LED treatment for histologic assessments.

**Results:** Without LPS injection, significant fiber re-alignment and matrix re-organization was noted at day 7 under medium- and high-dose LED treatment, and deposition of bundle bone was not evident until day 14. With LPS injection, significant reduction of attachment loss was noted in medium- and high-dose LED treated specimens at day 3 and 7, and rapid deposition of bundle bone was seen in medium-dose group from day 3. Matrix re-organization was delayed in all specimens, and significant fiber re-alignment was noted under medium- and high-dose LED treatment at day 14.

**Conclusion:** The near-infrared LED treatment appeared beneficial for the repair of experimental periodontitis by accelerating the recovery of matrix and collagen matrix, preventing progressive attachment loss, and deposition of bundle bones and may be suitable as an adjunct modality for post-operative care. We will further seek the appropriate dose of LED irradiation for human use.

## Topic: Clinical Research: Periodontal Therapy

**P0307****The effect of sugar-free chewing gum on plaque and clinical parameters of gingival inflammation: a systematic review**

R.S. Keukenmeester, D.E. Slot, F. Van Der Weijden  
Amsterdam/Netherlands

**Aim:** The aim of this study was to systematically review the present literature on the clinical effects of sugar-free chewing gum on plaque indices and parameters of gingival inflammation.

**Material and Methods:** The MEDLINE-PubMed, Cochrane-CENTRAL and EMBASE databases were searched through November 2011 to identify any appropriate studies. Plaque indices and parameters of gingival inflammation were selected as outcome variables.

**Results:** An independent screening of the 365 unique titles and abstracts identified 5 non-brushing and 4 brushing studies that met the eligibility criteria. In the non-brushing studies, the use of chewing gum did not significantly affect the parameters of interest. In the descriptive analysis of the brushing studies, 4 out of 5 comparisons showed a statistically significant effect in favor of the sugar-free chewing gum with respect to plaque scores. The meta-analysis for the Quigley & Hein (1962) plaque index scores in the brushing studies also showed a significant difference (DiffM -0.24, 95% CI [-0.41; -0.08]). For bleeding tendency, the descriptive analysis showed that 1 out of 2 comparisons identified a significant difference in favor of chewing gum. The meta-analysis, however, did not substantiate this difference.

**Conclusion:** Within the limitations of this systematic review, it may be concluded that the use of sugar-free chewing gum as an adjunct to toothbrushing provides a small but significant reduction in plaque scores. In the absence of brushing, no effect could be established.

## Topic: Clinical Research: Periodontal Therapy

**P0308****A retrospective longitudinal study on aggressive periodontitis in young individuals**

J. Zakrisson, B. Sjödin  
Örebro/Sweden

**Aim:** The aim of the present retrospective study was to evaluate the long-term result of conventional periodontal treatment in young patients with localized aggressive periodontitis and relate the outcome to the amount of periodontal maintenance treatment given over time.

**Material and Methods:** 37 individuals, 13-23 years old, showing vertical bone-loss >3 mm and probing pocket depth of >5 mm at >1 site, were included in the study. Data on periodontal measurements from baseline and revaluation after treatment were collected from the dental records. The patients were re-examined 14,7 yrs (mean) after revaluation and the number of annual appointments during the last 5 years before re-examination was recorded.

**Results:** Significant improvements in mean values regarding PI %, BoP % and number of bone loss teeth, could be shown between baseline and revaluation. At the present re-examination PI % and BoP % was comparable to revaluation-values, but the number of teeth with loss of marginal bone had risen from 5 to 7 and the number of pathological pockets were significantly higher. Patients with more frequent appointments to dentist or dental hygienist showed none or minor deterioration of the periodontal status.

**Conclusion:** Localized aggressive periodontitis in young individuals can be successfully treated. The importance of regular maintenance care is emphasised.

## Topic: Clinical Research: Periodontal Therapy

**P0309****Clinical and microbiological longitudinal monitoring of patient with aggressive periodontitis treated by systemic antibiotic and laser or ultrasonic debridement**

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Nantes/France

**Aim:** our aim was to analyze during 18 months, the clinical and microbiological effects, of antibiotic therapy and to compare laser to ultrasonic debridement in the treatment of generalized aggressive periodontitis.

**Material and Methods:** Patient is aged 31 years, suffering from generalized aggressive periodontitis. we have prescribed antibiotics for 8 days, then we have achieved a full-mouth debridement in a split mouth technique after randomization with laser ER-yag kavo (160mj,10Hz), or ultrasonics debridement.

Clinical and microbiological data were recorded on days 0, 7, 14, 2 months and 1 year.

**Results:** The bacterial analysis showed a complete absence of Aa and Pg

After 7 days, antibiotic therapy decrease significantly the pocket depth, the total bacterial load, and periodontopathogens load.

The ultrasonic debridement shows a decrease in probing depth from 70% to 2 months and 58% in 1 year and in total bacterial load of 50% at 1 year and in reduction of periodontopathogens 98% 1 week after debridement, and 54% at 1 year.

The laser debridement show a decrease in probing depth of 53% at 2 months but 52% at 1 year and in bacterial load of 84% 1 week after and 66% at 1 year and a reduction of periodontopathogens 98% 1 week after 93% at 1 year.

**Conclusion:** The absence of Aa and Pg on this type of aggressive periodontitis is rather unusual.

Antibiotic therapy alone show a real impact.

Microbiological clinical outcomes show that the results of laser treatment is best maintained after one year. The mode of action of the laser seems to provides better stability of the results.

## Topic: Clinical Research: Periodontal Therapy

**P0310****Oral Rehabilitation of a Patient with Generalized Aggressive Periodontitis**

H.S. Bostancı, B. Gergin

Ankara/Turkey

**Aim:** Generalized aggressive periodontitis is defined as the involvement of at least three permanent teeth other than first molars and incisors. We aimed to present comprehensive treatment planning of a 20-year-old female patient who was diagnosed as GAP with radiographical and clinical findings.

**Material and Methods:** A 20-year-old female was applied with gingival bleeding, mobility and pain. Her mother was reported to have a history of early tooth loss. Intraoral examination revealed inadequate oral hygiene. Mean PI and GI scores were 2, mean PD was 7 mm and BOP + at all sites. Mobility scores were 3 at the teeth #13, 14, 15, 26, 36 and 2 at the teeth #16, 12, 21, 22, 31, 41, 44. Radiological evaluation revealed advanced generalized bone loss. Extraction of the teeth #16, 15, 14, 13, 26, 36, 31 and SCRP for the remaining teeth under local anesthesia was performed in 24 hour period. Patient received systemic antibiotic therapy (amoxicillin+potassium clavulanate, 2x1000 mg/day) for five days; rinsed twice daily with 0.2% chlorhexidine digluconate for 2 weeks and was given oral hygiene instructions (i.e. modified Bass brushing technique, and interdental brush). Patient recalled once a month for the remaining 2-year observation period. Then, prosthodontic rehabilitation with dental implants and fixed restorations was performed.

**Results:** Clinical results were satisfactory and better than expectations of the patient.

**Conclusion:** Accurate diagnosis, treatment planning and careful follow-up of the patient's development are prerequisites to successful therapy. Functional, phonetic, and esthetic aspects must be addressed to treat the patient efficaciously within the limits of the case.

## Topic: Clinical Research: Periodontal Therapy

**P0311****Er:YAG laser in the treatment of periodontal sites with recurring chronic inflammation: a 12-month randomized, controlled clinical trial**

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Bergen/Norway

**Aim:** The aim of this randomized, controlled clinical trial was to compare the clinical and microbiological effects of pocket debridement using erbium-doped:yttrium, aluminium, and garnet (Er:YAG) laser to conventional debridement in maintenance patients.

**Material and Methods:** Fifteen patients, all smokers, having at least four teeth with probing depth (PD)  $\geq 5$  mm were recruited. Two pockets in each of two jaw quadrants were randomly assigned to subgingival debridement using an Er:YAG laser (test) or ultrasonic scaler/curette (control) at 3-month intervals. Probing attachment level (PAL), PD, bleeding on probing, and

dental plaque were recorded at baseline and at 6 and 12 months. Microbiological samples were taken at the same time points and analysed using a checkerboard DNA-DNA hybridisation technique.

**Results:** A significant decrease in PD took place in both treatments from baseline to 12 months ( $p < 0.01$ ). In the control group, the mean initial PD decreased from 5.4 mm to 4.0 mm at 12 months. For the test group, a similar decrease occurred from baseline to 12 months, from 5.3 mm to 3.4 mm. No significant between-treatment differences were shown. The mean PAL showed no overall significant inter- or intratreatment differences ( $p > 0.05$ ). No significant between-treatment differences were observed in microbiological composition or total pathogens.

**Conclusion:** The results failed to support that Er:YAG laser may be superior to conventional debridement in the treatment of smokers with recurring chronic inflammation. This appears to be the first time that repeated Er:YAG laser instrumentation has been compared with mechanical instrumentation of periodontal sites with recurring chronic inflammation over a clinically relevant time period.

## Topic: Clinical Research: Periodontal Therapy

**P0312****Salivary pH in adult periodontitis before and after treatment with hyaluronic acid gel.**M.C. Giurgiu<sup>1</sup>, S. Paunica<sup>1</sup>, G. Maniu<sup>2</sup>, A.S. Dumitriu<sup>1</sup><sup>1</sup>Bucharest/Romania, <sup>2</sup>Ploiesti/Romania

**Aim:** The objective of the study was to evaluate the salivary pH after periodontal treatment with hyaluronic acid gel.

**Material and Methods:** 34 subjects aged between 36 and 59 with adult periodontitis were selected. Three parameters were monitored before and after periodontal treatment with hyaluronic acid gel: pH, PI and BI. PH was determined on unstimulated saliva with GC Saliva-Check Buffer. The data was analyzed by statistical package (SPSS, CHICAGO, IL, USA) using T-paired test and Chi square test.

**Results:** Before treatment pH was normal [6.7-7.8] 64.7% and moderated acid [6-6.6] 35.3%. After treatment the difference is statistically non significant in the case of pH, but significantly lower ( $p < 0.0001$ ) for both PI and BI. The results showed that the value of PI has a significant influence on the value of the pH ( $p < 0.01$ ) only before the treatment. After the treatment, in 83% of the cases of patients that had a moderately acid pH, the level of the pH became normal and, for the others, the level of pH increased towards the lower edge of the interval of the pH normal values. There is no significant influence of BI over pH before the treatment, and also no significant influence of PI or BI over pH, after the treatment.

**Conclusion:** The study shows that after periodontal treatment with hyaluronic acid the value of pH tends to neutral and also supports the efficacy of hyaluronic acid in periodontal regeneration.

## Topic: Clinical Research: Periodontal Therapy

**P0313****Efficacy of diode laser as an adjunct to non-surgical treatment of chronic periodontitis**H. Ozdemir<sup>1</sup>, A..B. Altan<sup>2</sup>, A. Akpınar<sup>1</sup>, H. Toker<sup>1</sup>, H. Aydın<sup>1</sup><sup>1</sup>Sivas/Turkey, <sup>2</sup>Kocaeli/Turkey

**Aim:** The aim of this study is to evaluate the effect of low-level laser therapy as an adjunct to nonsurgical periodontal therapy of patients with chronic periodontitis.

**Material and Methods:** 30 systemically healthy adults (fifteen nonsmoking and smoking) with untreated chronic periodontitis were assigned in a split-mouth design to receive SRP with or without one course of low-level laser therapy within 1 month. A diode laser (820 nm, 4 J/cm<sup>2</sup>) was applied to the gingival surface after periodontal treatment on the baseline, first, second, and third weeks. GCF samples and serum (Total Oxidant Status (TOS) and Total Antioxidant Status (TAS) levels) were collected from all patients and clinical parameters were recorded on baseline, and four weeks after treatment.

**Results:** The primary outcome in present study was change in gingival bleeding and inflammation. After 1 months, the LLLT group showed significantly more improvement in Gingival Index (GI), clinical attachment level (CAL), and probing depth (PD) levels compared to the control group ( $P < 0.005$ ). There were clinically significant improvements in the laser-applied smokers' PD and GI levels compared to smokers to whom a laser was not applied, between the baseline and 1 month. ( $P < 0.05$ ) Nonmarker level change (TAS and TOS) showed significant differences between the groups ( $P < 0.05$ ). TAS levels significantly increased in both groups and TOS levels significantly decreased in both groups in the first month after the treatment.

**Conclusion:** The present study showed that associated therapy was suitable for non-surgical periodontal treatment. A low-level laser therapy could be a beneficial adjunct to nonsurgical treatment of chronic periodontitis.

## Topic: Clinical Research: Periodontal Therapy

**P0314****The effect of the alcohol vehicle solution in essential oil mouthrinses on plaque and parameters of gingival inflammation. a systematic review and meta analyses**

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Amsterdam/Netherlands

**Aim:** The purpose of this review was to systematically evaluate the effects of the alcohol vehicle solution (VS) in essential oils mouthwash (EOMW, Listerine brand) with respect to plaque, parameters of gingival inflammation and probing depth.

**Material and Methods:** PubMed-MEDLINE, Cochrane-CENTRAL and EMBASE databases were searched to identify appropriate papers. The effects VS in comparison to EOMW. The mouthwashes were either used as monotherapy or as adjunct to self-performed daily oral hygiene. For experimental gingivitis, plaque and gingivitis were the parameters of interest. Parameters in long-term studies (two months or more) were

plaque, gingivitis, stain and probing depth. Where appropriate, meta-analysis were performed and weighted mean differences (WMD) were calculated.

**Results:** In total 594 unique titles and abstracts were found, of which 4 met the eligibility criteria. Meta-analysis of 2 long-term studies showed that EOMW provided significantly better effects regarding plaque control than the vehicle control (WMD=-0.45,  $P=0.00001$ ; I<sup>2</sup>=0%,  $P=0.32$ ). No significant difference with respect to reduction of gingival inflammation was found between EOMW and its vehicle control (WMD=-0.27,  $P=0.18$ ; I<sup>2</sup>=92%,  $P=0.004$ ).

**Conclusion:** Limited data was available to address the review question. Within these limitations EOMW appears to provide a larger effect on plaque scores than its vehicle control. For control of gingival inflammation, essential oils have no additional benefit, however significant heterogeneity was observed. The data retrieved for this review suggested that with EOMW there is an effect beyond the vehicle control which needs further studies to substantiate its extend.

## Topic: Clinical Research: Periodontal Therapy

**P0315****Adjunctive Photodynamic Therapy in Patients with Generalized Aggressive Periodontitis**

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Istanbul/Turkey

**Aim:** Generalized aggressive periodontitis (GAgP) is a periodontal disease characterized by rapid loss of alveolar bone in young individuals. The aim of this study was to investigate the effect of photodynamic therapy (PDT) adjunctive to scaling/root planing (SRP) in patients with GAgP.

**Material and Methods:** In this study, 24 systemically healthy nonsmoking subjects with GAgP were enrolled. Subjects were randomly assigned to a control group treated with SRP only or to a test group treated with SRP and PDT. Plaque index, sulcus bleeding index (SBI), probing depth (PD), relative attachment level, recession and mobility were recorded at baseline and day 63. Subgingival plaque samples were collected from the sites with PD $\geq$ 5 mm at the same time points and evaluated for *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis*, *Prevotella intermedia*, *Tannerella forsythia* and *Treponema denticola* using micro-IDent test.

**Results:** Clinical and microbiological parameters reduced significantly in both groups after treatment ( $p < 0.01$ ). Only the reduction in full mouth SBI of the test group was significantly better than the control group ( $p < 0.05$ ). Although the reduction of periodontopathogens of the test group was greater than that of the control group, there were no significant differences between the groups.

**Conclusion:** Within the limits of this study, it can be concluded that PDT adjunctive to SRP does not lead to a beneficial effect on the microbiological parameters in the treatment of GAgP. Nevertheless, the significant difference in the SBI score demonstrated that PDT may have an additional effect on the reduction of gingival bleeding and inflammation.



## Topic: Clinical Research: Periodontal Therapy

**P0316****The effect of the non-surgical periodontal therapy on the serum and salivary 8-OHdG and 8-iso-PGF2 $\alpha$  levels**

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Isparta/Turkey

**Aim:** The aim of the present study is to evaluate the effect of the non-surgical periodontal therapy on serum and salivary 8-OHdG and 8-iso-PGF2 $\alpha$  levels in chronic periodontitis (CP) patients.

**Material and Methods:** Twelve generalized chronic periodontitis patients have completed the study. The clinical periodontal parameters (gingival index, plaque index, bleeding on probing, pocket depth, clinical attachment level) were recorded, and serum and salivary samples were provided to evaluate the levels of 8-OHdG and 8-iso-PGF2 $\alpha$  at the baseline. All of the patients have received one stage full mouth debridement (FMDEB) procedure within 24 hours. The recording of the clinical periodontal parameters, serum and salivary sampling were repeated after two months.

**Results:** The clinical parameters were found significantly decreased after FMDEB ( $P < 0.05$ ). The serum and salivary 8-OHdG and 8-iso-PGF2 $\alpha$  levels were significantly lower after two months when compared to the baseline values ( $P < 0.05$ ).

**Conclusion:** The decreased serum 8-OHdG and 8-iso-PGF2 $\alpha$  levels after non-surgical periodontal therapy in CP patients should be evaluated as the most important result of the present study, in terms of the commitment of 8-OHdG and 8-iso-PGF2 $\alpha$  to the systemic inflammatory burden and their role in cardiovascular disease risk.

## Topic: Clinical Research: Periodontal Therapy

**P0317****Histological and profilometric evaluation of root surface after instrumentation with a new piezoelectric device - ex vivo study**

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Coimbra/Portugal

**Aim:** An ultrasound device designed for piezoelectric surgery (VarioSurg®, NSK, Japan) recently appeared in the market, with an application on periodontal therapy. Using an ex vivo model, we set out to assess root changes arising from using this device (profilometric and histologic evaluation), comparing with periodontal curettes.

**Material and Methods:** Prior to extraction, three groups of 10 hopeless teeth each were subjected to different root instrumentation: Group CUR - Gracey Curettes; Group US50 - VarioSurg® device Surg 50% setting; Group US100 - VarioSurg® device Perio 100% setting. After extraction, all teeth were photographed to visually assess the presence of dental calculus. The treated root surfaces of each group were profilometrically evaluated (Perthometer®, Germany). Non decalcified histological sections

were prepared in order to assess changes in cementum. Statistical analysis was carried out using the Kolmogorov-Smirnov and ANOVA-one way tests, with a significance level of 95%.

**Results:** All tested instruments proved to be effective in the complete removal of calculus. The profilometric results were the following - Group CUR: Ra=2,28 $\mu$ m( $\pm$ 0,578), Rz=15,34 $\mu$ m( $\pm$ 3,327), Rmax=20,70 $\mu$ m( $\pm$ 6,417); Group US50: Ra=3,01 $\mu$ m( $\pm$ 0,614), Rz=19,79 $\mu$ m( $\pm$ 3,345), Rmax=27,19 $\mu$ m( $\pm$ 5,584); Group US100: Ra=2,65 $\mu$ m( $\pm$ 0,734), Rz=17,94 $\mu$ m( $\pm$ 4,039), Rmax=25,14 $\mu$ m( $\pm$ 5,231). No statistical significant differences were observed. Histologically, between test and control surfaces, there was a cementum thickness reduction in all groups. However this reduction was higher and more irregular in group US50.

**Conclusion:** This instrument proves to be as effective as curettes in calculus removal, in both settings. However, within the limits of this study, the US device in Surg 50% setting causes more histological damage to the root surface than curettes and Perio 100%.

## Topic: Clinical Research: Periodontal Therapy

**P0318****Regenerative therapy of infrabony defects with and without doxycycline: early wound healing and postsurgical pain. A randomized placebo-controlled clinical trial.**

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**Aim:** Many studies on regenerative therapy report post- or perisurgical antibiotic regimens. However, only a few trials have investigated the additional effect of adjunctive antibiotics in regenerative periodontal surgery. Up to now tetracycline derivatives have not been evaluated for their additional benefit. Thus, this study was designed to compare regenerative therapy of intrabony defects with and without postsurgical systemic doxycycline.

**Material and Methods:** In each of 60 patients one intrabony defect (depth  $\geq 4$  mm) was treated regeneratively at 2 centres (Frankfurt/Main, Heidelberg). By random assignment patients received either 200 mg doxycycline per day (DOXY) or placebo (PLAC) for 7 days after surgery. Prior to and 6 months after surgery clinical parameters were obtained (probing depths: PPD; vertical attachment level: PAL-V). One week after surgery the early wound healing index (EWHI) and postsurgical pain (yes/no, intensity, duration, number of pain killers taken) were assessed.

**Results:** 58 patients (DOXY: 27; PLAC: 31) were re-examined 6 months after surgery (mean age 51.6 $\pm$ 10.4 years; 33 female, 14 smoker). In both groups statistically significant ( $p < 0.001$ ) PPD reduction (DOXY: 3.87 $\pm$ 1.20 mm; PLAC: 3.69 $\pm$ 1.13 mm) and PAL-V gain (DOXY: 3.11 $\pm$ 1.23 mm; PLAC: 3.40 $\pm$ 1.34 mm) were observed. Analysis failed to find statistically significant differences between the groups regarding EWHI. Also 7 days after surgery DOXY patients reported less pain than PLAC patients.

**Conclusion:** 200 mg systemic doxycycline for 7 days after

regenerative therapy of intrabony defects failed to result in better early wound healing or clinical results compared to placebo, however, resulted in less postsurgical pain.

## Topic: Clinical Research: Periodontal Therapy

### P0319

#### Clinical Effects of Nd:YAG Laser Applications during Nonsurgical Periodontal Treatment in Smoker and Non-Smoker Patients with Chronic Periodontitis

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**Aim:** The purpose of this study was to compare the clinical efficiency scaling and root planning (SRP) plus Nd:YAG laser (NDL) applications in the treatment of periodontal pockets in smoker and non-smoker patients.

**Material and Methods:** The study population consisted of 52 patients with generalized moderate chronic periodontitis (CP) (26 smokers, 26 non-smokers). The study compared the clinical effects of SRP and SRP plus NDL in periodontal pockets between 4-6 mm of CP smoker and non-smoker patients. The present study included four groups: group 1—test teeth in smoker patients (ST; n=52); group 2—placebo teeth in smoker patients (SP; n=52); group 3—test teeth in non-smoker patients (NST; n=52); and group 4—placebo teeth in non-smoker patients (NSP; n=52). Clinic examinations were performed immediately before SRP (the baseline) and 1 (R1) and 6 (R2) months after treatment.

**Results:** At R1 and R2 from the baseline, the mean changes in PPD (probing pocket depth), GI (gingival index), and GCF (gingival crevicular fluid) volume in the NST group were higher than in the SP and ST groups ( $p > 0.05$ ), whereas the NSP group was only higher than the SP group ( $p > 0.05$ ). The average changes in PPD, GI, and GCF volume were similarly between the ST and NSP groups ( $p < 0.05$ ).

**Conclusion:** Our results supported the idea that NDL applications provide additional benefits in the periodontal treatment of smokers via greater effects upon pigmented tissue or pigmented bacteria.

## Topic: Clinical Research: Periodontal Therapy

### P0320

#### The usnic acid, an alternative for periodontal therapy

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Bucharest/Romania

**Aim:** In senior plants there were found many antiseptics which keep down or destroy the activity of microorganisms. One of these substances is the usnic acid, a vegetable extract with germicidal action, similar with the antibiotics. We think that this substance could be used for periodontal therapy, too.

**Material and Methods:** Were ingathered sterile samples from periodontitis diseases (25 patients) during 2008-2011. The samples were set beside a suspension of usnic acid for 1 minute, 2 minutes, 5 minutes and 15 minutes. Every sample was put in Brain Heart Infusion in order to determine the decrease curve for Total Number of Germs, developed at different periods of time from incubation: 3 hours, 6 hours, 16 hours and 24 hours. The establishment of Total Number of Germs was realised through the use of microdilution and blood-gelose medium.

**Results:** The usnic acid selectively inhibits the development of biofilms mould by bacteria from periodontitis. The multiplication was affected by the connection with usnic acid. The usnic acid could induce the change of the bacteria features through the involvement of the wall cell structure.

**Conclusion:** The germicidal action of usnic acid prove the possibility of using it for obtaining dental products able to prevent the development of dental plaque, as a new ecologic anti-infectious strategy which could be an alternative for the conventional antibiotic therapy.

## Topic: Clinical Research: Periodontal Therapy

### P0321

#### Healing of periodontal fenestration defects treated with PRP derived from bone marrow aspirate

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**Aim:** This study histomorphometrically analyzed the influence of platelet-rich plasma (PRP) derived from bone marrow aspirate (BMA) on the healing of surgically created periodontal fenestration defects in rats.

**Material and Methods:** Forty rats were divided into two groups: C (control) and PRP-BMA. A periodontal fenestration defect was surgically created on the buccal aspect of the right mandibular first molar of each animal. In Group C, the defect was filled by a blood clot only. In Group PRP-BMA, the defect was filled with PRP derived from BMA. Animals were euthanized at either 10 or 30 days postoperative. The percentages of new cementum (NC), new bone (NB) and density of new bone (DNB) were histometrically evaluated. Data were statistically analyzed (ANOVA, Tukey,  $p < 0.05$ ).

**Results:** At 10 days, groups C and PRP-BMA presented similar amounts of NB ( $39.67 \pm 25.83\%$  and  $49.68 \pm 22.63\%$ , respectively) and DNB ( $29.59 \pm 17.84\%$  and  $32.69 \pm 12.34\%$ , respectively). At 30 days, groups C and PRP-BMA also presented similar amounts of NB ( $75.53 \pm 13.48\%$  and  $81.34 \pm 11.76\%$ , respectively) and DNB ( $64.51 \pm 9.99\%$  and  $68.35 \pm 10.16\%$ , respectively). Cementum formation was not observed in any specimen of Group C at either period of evaluation. New cementum was observed in most specimens of Group PRP-BMA at 30 days ( $74.94 \pm 13.93$ ).

**Conclusion:** It can be concluded that PRP-BMA promoted cementum formation in periodontal fenestration defects in rats. Bone formation was similar in both groups.

## Topic: Clinical Research: Periodontal Therapy

**P0322****Azithromycin as an adjunctive treatment of generalized severe chronic periodontitis: Clinical, microbiological and biological parameters.**

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**Aim:** To study the efficacy of azithromycin in combination with nonsurgical periodontal therapy on clinical, microbiological parameters and gingival crevicular fluid (GCF) matrix metalloproteinases-8 (MMP-8) levels over 6 months in severe generalized chronic periodontitis patients.

**Material and Methods:** Twenty eight out of 36 severe generalized chronic periodontitis patients were included in this randomized, double-blind, placebo-controlled, parallel-arm study. They were randomly assigned to azithromycin or placebo groups (500 mg once daily for 3 days). Clinical parameters were recorded. GCF samples were obtained from one, while microbiological samples collected from two single-rooted teeth with PD $\geq$ 6 mm. Microbiological parameters were analyzed by quantitative real-time polymerase chain reaction for *Aggregatibacter actinomycetemcomitans* (*A. actinomycetemcomitans*), *Porphyromonas gingivalis* (*P.gingivalis*), *Tannerella forsythia* (*T. forsythia*), *Fusobacterium nucleatum* (*F. nucleatum*), *Prevotella intermedia* (*P.intermedia*) and total bacteria. GCF MMP-8 levels were determined by IFMA.

**Results:** Azithromycin and placebo groups demonstrated similar, but significant improvements in all clinical parameters ( $p<0.05$ ). *A. actinomycetemcomitans*, *P. gingivalis*, *T. forsythia*, *P. intermedia* and total bacteria significantly decreased over the 6 months period in both groups, while *F.nucleatum* significantly reduced in all visits in azithromycin group, which was also lower compared to those of the placebo group ( $p<0.05$ ). Azithromycin and placebo groups exhibited significant reduction in GCF MMP-8 levels at post-treatment visit and at 2 weeks ( $p<0.05$ ).

**Conclusion:** On the basis of the present findings, it can be concluded that adjunctive azithromycin provides no additional benefit over nonsurgical periodontal treatment on parameters investigated in severe generalized chronic periodontitis.

## Topic: Clinical Research: Periodontal Therapy

**P0323****The longitudinal survey on alveolar bone alterations of patients with chronic periodontitis**

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**Aim:** To evaluate the effect of supportive periodontal therapy on maintaining alveolar bone level.

**Material and Methods:** A longitudinal study over a period of at least 2 years was conducted. The total of 39 patients with chronic periodontitis recruited in the study and divided into non-maintenance group ( $n=22$ ) and maintenance group ( $n=17$ ). The patients were monitored for average of 5.09 years and 7.53 years

in non-maintenance group and maintenance group. The alveolar bone height were measured at proximal sites of each tooth in full month radiographs by a radiographic computerized method and was expressed as % of the root length.

**Results:** There were 9 patients with general pattern of bone height reduction over time (7 in the non-maintenance group and 2 in the maintenance group). Their mean bone loss at individual level was more than 5% of the root length. Furthermore, the proportion of site with bone loss more than 10% or 20% of the root length was 21.72%, 7.96% in non-maintenance group versus 11.74%, 2.3% in maintenance group. In maintenance group, 39.36% of molar sites showed bone loss more than 5% of the root length and 4.13% showed bone loss more than 20%, non-molar sites were 25.33%, 2.3% respectively. In the non-maintenance group, 48.28% of molar sites showed bone loss more than 5% of the root length, 10.61% showed more than 20%. And non-molar sites were 34.79%, 6.96%.

**Conclusion:** Supportive periodontal therapy prevented alveolar bone loss in individual and site level. Molar sites in both group showed more bone loss compared to the non-molar site.

## Topic: Clinical Research: Periodontal Therapy

**P0324****Alpha Lipoic Acid was induced the epithelial Apoptosis Proliferation and Thickness during Periodontitis**

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Erzurum/Turkey

**Aim:** Apoptosis or programmed cell death, and it is essential for the normal functioning in living body. Alpha-Lipoic acid (ALA) is one of powerful antioxidant and can alter the redox status. The present study was conducted to examine the relationship between periodontal disease and apoptosis, as well as possible underlying mechanism related periodontal disease.

**Material and Methods:** 18 male Wistar rats were selected and divided into three groups (Control, PED and PED+ALA). The rat's mandibular first molar teeth were ligatured for 4 weeks to induce periodontitis and then 4 weeks after the ligature was removed. Periodontitis induction was applied to only PED+ALA group. Alpha-Lipoic acid was given intra-gastric dose of 120 mg/kg for 2 weeks.

**Results:** Biochemical Myeloperoxidase activity was increases in PED group. Although expression of bax protein was decreased, expression of bcl-2 protein level was increased in periodontitis group to compared control and ALA treated groups. PCNA expression and epithelial thickness also increased in control and ALA group sections.

**Conclusion:** The results of study revealed that ALA-administration can induce the apoptosis of gingiva epithelial cells. The mechanism by which alpha lipoic acid inactivate the Akt (PKB) pathway and inactivation of AKT could result in activating caspase-9 and then apoptosis was induced in periodontal tissues. In this way, apoptosis can also accelerate the cell regeneration and migration in the periodontitis during ALA-treatment.

## Topic: Clinical Research: Periodontal Therapy

## P0325

**Effect of Alpha Lipoic Acid and Vitamin C on Periodontal oxidative stress in Periodontitis induced Rats**

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Erzurum/Turkey

**Aim:** Alpha-Lipoic acid (ALA) and Vitamin C (Vit-C) are vitamin and powerful antioxidant which have been used clinically for treatment of many diseases. Many recent studies show that imbalances of pro-oxidants and antioxidants may play a major role in the beginning of periodontal diseases, the present study aim to investigate the role of ALA against the oxidative stress in periodontitis as well possible underlying mechanism that relates periodontitis

**Material and Methods:** 36 Wistar male rats were selected and divided into four groups (Control, PED, PED+ALA and PED+ALA+Vit-C). The rats mandibular first molar teeth was ligatured for 4 weeks to induce periodontitis and then 4 weeks after the ligature was removed. Periodontitis induction was applied to just PED, PED+ALA and PED+ALA+Vit-C groups. ALA was given intra-gastric dose of 100 mg/kg for 2 weeks and Vitamin C was injected intra peritoneal dose of 150 mg/kg for 2 weeks.

**Results:** The results of our histopathologic and biochemical analyzing show that ALA and Vit-C prevent the chemotaxis and reduce the oxidative damages of periodontal tissue, therefore administration of ALA, Vit-C and both ALA and Vit-C have a preventive effect against oxidative stress and collagen synthesis, in addition, protect from oxidative stress mediated DNA damages.

**Conclusion:** Therefore, our data provide evidence that reactive oxygen species plays an important role in periodontal diseases and both the antioxidant ALA and Vit-C has therapeutic potential effects on the inhibition of periodontal tissue destruction and oxidative stress.

## Topic: Clinical Research: Periodontal Therapy

## P0326

**Effectiveness of regenerative periodontal therapy with Emdogain – a practice-based case control study**

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Goettingen/Germany

**Aim:** Aim was to investigate the effectiveness of regenerative periodontal therapy with enamel matrix proteins (Emdogain: EMD) in the treatment of intra-osseous defects, under conditions of a dental practice, and to compare the outcome with a control.

**Material and Methods:** In patients with chronic periodontitis (CP), who had received conservative periodontal therapy, different teeth were treated indication-related regeneratively with EMD (EMD-group). A matched control: age, gender, smoking habit, periodontal state (CP), only conservative periodontal therapy was formed (C-group). The following parameters were recorded as initial and final findings: pocket probing depth (PPD), bone reduction based on x-rays, and the bone reduction index (BRI). Statistical evaluation: t-test, chi-squared test and non-parametric analysis of variance ANOVA ( $p < 0.05$ ).

**Results:** Both groups consisted of 19 patients ( $f=6$ ,  $m=13$ ; mean age: EMD-group =  $48.37 \pm 10.89$  years, C-group =  $9.95 \pm 11.08$  years). The average observation period was  $63.26 \pm 14.97$  months (EMD-group) and  $50.42 \pm 16.3$  months (C-group). In both groups, a significant reduction in PPD was found ( $p=0.000$ ; EMD-group: 1.8mm, C-group: 1.1mm). The difference between the two groups was significant ( $p < 0.0001$ ). The BRI showed in both groups a statistically significant improvement: 0.19 in the EMD-group ( $p=0.000$ ) and 0.13 in the C-group ( $p=0.002$ ). Within the EMD-group, the radiologically determined bone reduction of the EMD-treated teeth showed no significant change over the observation period ( $p=0.046$ ), whereas the not EMD-treated teeth showed significant bone reduction ( $p=0.001$ ).

**Conclusion:** The results of the study show that the indication-related use of EMD in dental practice results in a moderately improved reduction in PPD and can prevent further bone loss.

## Topic: Clinical Research: Periodontal Therapy

## P0327

**Periodontal risk assessment following conservative periodontal therapy with an ultrasonic device – a practice-based, cross-sectional study with recall patients**M. Jablonski, K. Lange, E. Hornecker, R.F. Mausberg, D. Ziebolz  
Goettingen/Germany

**Aim:** Aim was to analyze the change of patient-related periodontal risk and single tooth prognosis following periodontal treatment with ultrasound.

**Material and Methods:** Patients with chronic periodontitis (CP), who had undergone periodontal therapy with ultrasound (Piezon Master 400®, EMS) and consecutive supportive periodontal treatment (SPT:  $\geq 1$ x/year) for at least three years were included. The findings at baseline (BL) were obtained from patient records (smoking, SPT-frequency), periodontal chart (dental status, pocket probing depth) and x-ray (bone reduction). The clinical follow-up (endpoint=EP) comprised the intermediate tooth loss, pocket probing depth and bone reduction (current x-ray). The patient-related periodontal risk assessment (low/average/high) and single tooth prognosis (very good/good/moderate/questionable/poor) at BL and EP were compared. Statistical evaluation: non-parametric analysis of variance ANOVA ( $p < 0.05$ ).

**Results:** 92 patients ( $55 \pm 12.6$  years;  $f=54$ ,  $m=38$ ) were examined. The average SPT was  $6.7 \pm 2.1$  years. The periodontal risk could be significantly reduced during the observation period ( $p < 0.05$ ): “low risk” increased from 12 to 42 patients, “average risk” and “high risk” were reduced from 63 to 43 or from 17 to 7 patients, respectively. Regarding single tooth diagnosis a significant shift in the direction to better prognosis was found ( $p < 0.05$ ): the prognosis was improved in 66% of front teeth, 64% of premolars, and 51% of upper and lower jaw molars. Smoking habits were identified to be a significant influencing factor ( $p < 0.05$ ).

**Conclusion:** The results show that, in case of chronic periodontitis a conservative periodontal therapy with ultrasound and consequent SPT the periodontal risk is reduced in the long run and the single tooth prognosis can be improved.



## Topic: Clinical Research: Periodontal Therapy

**P0328****Short-Term Clinical Effects of KTP Laser Therapy in Non-Surgical Periodontal Treatment of Chronic Periodontitis**

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Erzurum/Turkey

**Aim:** The main goal of periodontal treatment is to control infection and thereby curb disease progression. Recent studies have suggested that the use of laser as an adjunct to scaling and root planing (SRP) might improve the effectiveness of conventional periodontal treatment. The aim of this study was to evaluate the clinical effects of potassium-titanyl-phosphate (KTP) laser therapy for SRP in the treatment of chronic periodontitis.

**Material and Methods:** Twenty-two patients with untreated chronic periodontitis were treated using a split-mouth study design in which each side was randomly treated by SRP alone (control group) or KTP laser (0.8W, time on 50ms, time off 50ms, 30s, 532nm) followed by SRP (test group). The selected teeth were probed with a pressure-controlled probe, guided by stents. Clinical periodontal parameters including plaque index (PI), bleeding on probing (BOP), probing pocket depth (PPD), and probing attachment level (PAL) were recorded at baseline and at 8 weeks following therapy.

**Results:** Statistical analysis demonstrated no differences between groups at baseline for all parameters ( $P>0.05$ ). Both treatments yielded significant improvements in terms of BOP and PPD decrease and PAL gain compared to baseline values ( $p<0.05$ ). The test group showed a greater reduction in PPD compared to the test group ( $p<0.05$ ). In addition, the test group showed a greater probing attachment gain compared to the test group ( $p<0.05$ ).

**Conclusion:** In patients with chronic periodontitis, clinical outcomes of conventional periodontal treatment can be improved by using adjunctive KTP laser.

## Topic: Clinical Research: Periodontal Therapy

**P0329****Surface Quality of Ceramic after Air Powder Treatment in Dental Hygiene Procedures - an in vitro study -**

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Graz/Austria

**Aim:** Air-powder abrasive instruments are used in dental hygiene and periodontology. With reference to the relevant literature it is shown, that air-polishing devices can cause substance loss and surface damage. The aim of this in-vitro study was to investigate the effects of the air-powder abrasive instrument on ceramic surfaces.

**Material and Methods:** Ceramic:

Sample discs ( $n=40$ ) from two commercial industrial fabricated ceramic blocks were fabricated (MarkII-VITABLOCS®, Vita, and IPS Empress®-CAD).

**Pre-treatment:** The pre-treatment method of the ceramic was either glazing or polishing. The ceramic surfaces were subjected to the spray from the air powder device (Air Flow® Handy, Prophylaxis Powder Air-Flow Classic, EMS-Switzerland, 5mm distance, 90°) for 15 or 30 seconds.

**Analysis:**

The possible defect depths were analysed with an optical 3D measurement device for quality assurance in the micro- and nano-range and compared to the untreated surfaces.

**Results:** All ceramic surfaces treated with an air-powder abrasive system resulted in substance loss (0,711 µm to 1,265 µm).

Time had an influence on defect depth. There was a significant difference between 15 and 30 seconds of air powder treatment ( $p<0,05$ ).

No significant difference between glazed and polished ceramic surfaces ( $p>0,8$ ).

No moderate pitting or surface cracking.

**Conclusion:** With the results of this in-vitro study it was clearly stated that air-powder instruments cause substance loss in ceramic surfaces. Air powder treatment could also cause enhanced biofilm formation in the following. It is recommended that the air powder instrument not be used on ceramic surfaces.

## Topic: Clinical Research: Periodontal Therapy

**P0330****The influence of wear of different electrical toothbrushes on oral hygiene assessed over a 6-month observation period**

V. Hrasky, S. Wurbs, K. Lange, E. Hornecker, R.F. Mausberg, D. Ziebolz

Goettingen/Germany

**Aim:** Aim was to investigate whether wear of electrical toothbrushes has an influence on plaque removal and gingival state.

**Material and Methods:** Two types of electrical toothbrushes (TB) with different operating modes: rotary-oscillating (ProfessionalCare 7000, Procter&Gamble) and sonic-active (Sonicare, Philips) were randomly divided into two groups according to duration of use: 6 months continuously and 4 weeks (change of brushhead) over 6 months. 48 subjects were allocated on the basis of their oral hygiene (QHI) at the start by drawing lots to 4 groups A-D ( $n=12$ ). At baseline, 14 days, 8, 12, 16 and 24 weeks QHI and gingival state (PBI) were documented. After 24 weeks, each subject received a new brushhead; in week 26, QHI and PBI were finally recorded. Statistical evaluation: analysis of covariance ( $p<0.05$ ).

**Results:** With the 4-week use, the changes in QHI and PBI were independent of the TB (QHI:  $p=0.354$ ; PBI:0.358). While the QHI showed an improvement compared to baseline ( $p<0.05$ ), there was no significant change for PBI. With 6-month use, there was a significant interaction for QHI and PBI between TB and date (QHI:  $p=0.01$ ; PBI:  $p=0.003$ ). For QHI, after 16 (rotating) or 24 weeks (sonic), respectively, there was no significant difference compared to baseline. In PBI was a significant worsening with the rotating TB ( $p=0.02$ ) after 24 weeks.

**Conclusion:** With increasing wear, the effectiveness of the electrical TB regarding plaque removal declined, and gingival inflammations appeared increasingly. Nevertheless, the sonic TB showed a better result compared to the rotating TB over the 6-month observation period.

Topic: Clinical Research: Periodontal Therapy

## P0331

### Experimental study in vitro of the teeth air polishing treatments: different powders and different timing on hard tissue (enamel; cementum; dentine)

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Milano/Italy

**Aim:** : the aim of this study was been to evaluate certain in vitro effects of the AirPolishing (AP) powders (bicarbonate; glycine powders) on different surfaces of the teeth.

**Material and Methods:** In context, the enamel and root surfaces of 22 teeth (18 PERMANENT / 4 deciduous) newly-extracted teeth have been treated with AP Bicarbonate or 2 glycine powder, observing exposure criteria of the surfaces (time 5"; 10"; 20"). For the study we used an air polishing device made by EMS SA – Nyon with the highest setup.

**Results:** In the assessment of the various treatment timings (5"; 10"; 20"), we have gone on to perform a micro-morphological and structural analysis by means of an electronic scanning microscope. Perio powder, together with shorter time exposures, 5 sec, has shown to be least aggressive and abrasive on root surfaces of treatment conditions. Bicarbonate, Soft (glycine) powders, used within a time-scale > 5sec. also if not necessary, have shown to be however no aggressive and abrasive on enamel surface while Perio powder time-scale ≤ 5 sec, have shown compatibility for all surfaces which are the object of the study.

**Conclusion:** Air Polishing permit to reduce the debridement time. AP with Bicarbonate, Soft and Perio powders, together with shorter time exposures, 5 sec per each surface, (Bicarbonate and Soft for enamel- Perio for root surface) has shown to be the no aggressive and abrasive on teeth surfaces of treatment conditions.

Topic: Clinical Research: Periodontal Therapy

## P0332

### Periodontal Therapy Of Vertical Bone Loss In Molar Region

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Zagreb/Croatia

**Aim:** Periodontal therapy deals with many aspects of the supporting structures of the tooth, including the prevention and repair of lesions of the gingival sulcus, whereas endodontics deals

primarily with disease of the pulp and periapical tissues. The success of periodontal and endodontic therapies depends on the elimination of both disease processes. The relationship between periodontal and endodontic diseases and clinical procedures has been a subject of speculation for many years.

**Material and Methods:** This case report deals with therapy of vertical bone loss in molar region. Patient J. B. was referred to our Department for periodontal therapy. The estimated diagnosis was chronic periodontitis with deepest pockets around teeth 26, 36 and 46. The treatment plan included initial therapy and three separate surgical regenerative procedures around teeth 36 and 46, while the tooth 26 was endodontically retreated before regenerative surgical treatment because of persistent pain and radiologically inadequate filling of a root canal

**Results:** The periodontal and combined periodontal and endodontic treatments resulted in significant formation of the new bone and reduction of pocket depths around all three teeth.

**Conclusion:** After adequate endodontic and periodontal therapy with implementation of regenerative surgery, the teeth were fully functional with visible restitution of periodontium.

Topic: Clinical Research: Periodontal Therapy

## P0333

### Alternative Treatment Plane For Osseous Defect - Case Report

N. Karimi

Shiraz/Iran

**Aim:** Introduction: To emphasize the importance of treatment plan when dealing with a hopeless tooth showing a bone defect and to demonstrate the healing potential of periodontal aspect without advanced therapies.

**Material and Methods:** Case report: Mrs. N.M, a 51-year old housewife, attended the periodontology department of Shiraz Dental School. Due to socioeconomic problems, advanced treatment plans such as: 1.Tooth extraction, socket preservation and implantation 2.Tooth hemisection and orthodontic displacement of the premolar-like remaining structure in order to gain space for interdental papilla. Were not possible.

**Results:** Discussion: After several years from root canal therapy and a poor amalgam filling with overhang, a moderate bone osseous distal to first molar and furcation involvement appeared. Thus, in this case, scaling and root planing, soft tissue flap of the region and administration of amoxicillin 500mg (Tid) for 2 weeks was done to regain the periodontal structure respectively.

**Conclusion:** Conclusion: After 6 months, there was a successful regeneration and gain of bone just by using scaling and root planning, shaping of the defect and removal of granulation tissues. In addition, there was a reduction of probing pocket depth and gingival inflammation. This successful and simple treatment appeared to have a positive effect on the patient's general well-being. Key learning points: Simple treatment plans could be effective ;Avoiding extraction of teeth may improve quality of life of patients

## Topic: Clinical Research: Periodontal Therapy

**P0334****Effects of LLLT and aPDT on immunolocalization of proliferating cell nuclear antigen in gingival keratinocytes and fibroblasts in ovariectomized rats.**

L.H. Theodoro, E.C. Gualberto Junior, L.A. Fernandes, M.J.H. Nagata, A.F. Bosco, C.A. Casatti, E. Ervolino, V.G. Garcia

*Araçatuba, Sp/Brazil*

**Aim:** This study investigated the local effect of Low Level Laser Therapy (LLLT) and Antimicrobial Photodynamic Therapy (aPDT), as adjunctive therapies to scaling and root planing (SRP), on epithelial and fibroblast cells proliferation in gingival tissue, using proliferating cell nuclear antigen (PCNA) as a proliferation marker by immunohistochemical analysis in ovariectomized rats.

**Material and Methods:** A total of 270 female rats were divided into 3 groups: N, normal; O, OVX; and OE, OVX with estrogen replacement. Periodontal disease was induced through the introduction of a cotton thread around the first left mandibular molar. After 7 days, the ligature was removed, and animals were randomly divided into the following treatment groups: SRP, SRP plus saline solution; LLLT, SRP plus LLLT (660nm; 4.94 J/cm<sup>2</sup>/point; 24 seconds); and aPDT, SRP plus toluidine blue-O (100 µg/ml) irrigation followed by LLLT. Ten animals from each group were euthanized at 7, 15, and 30 days. The analysis of fibroblast and keratinocytes proliferation in the gingival tissue was performed by measuring the number of PCNA-positive. Data were statistically analyzed (P <0.05).

**Results:** In intergroup analysis, N group showed more proliferating cell nuclear antigen-positive keratinocytes than O and OE groups. At 7 days post-treatment, the animals of N and O groups treated with LLLT and all animals treated with aPDT showed more keratinocytes proliferation. Animals of group O treated with LLLT and aPDT had increased proliferating cell nuclear antigen-positive fibroblast compared to SRP treatment.

**Conclusion:** LLLT and aPDT positively affected, in vivo, the proliferation of keratinocytes and fibroblast in gingival tissue of ovariectomized rats.

## Topic: Clinical Research: Periodontal Therapy

**P0335****The influence of wear of manual toothbrushes on oral hygiene assessed over a six-month observation period**

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*Goettingen/Germany*

**Aim:** Aim was to investigate whether wear of manual toothbrushes influences plaque removal and gingival state.

**Material and Methods:** Four types of toothbrush (TB) with different hardness (soft/moderate) and head size (normal/short head), all Dr. Best Flex plus, GSK, were randomly divided into two groups for each type corresponding to the duration of use: 6 months continuously and 4 weeks (change of TB) over 6 months. 96 subjects were allocated on the basis of their oral hygiene (QHI) at the start by drawing lots to 8 groups A-H (n=12). At

baseline, 14 days, 8, 12, 16 and 24 weeks QHI and gingival state (PBI) were documented. After 24 weeks, each subject received a new toothbrush; in week 26, OHI and PBI were finally recorded. Statistical evaluation: analysis of covariance (p<0.05).

**Results:** QHI and PBI showed a significant difference between 4-weeks and 6-months use (QHI: p=0.0165; PBI: p=0.0396). In QHI, the difference between 4-weeks and 6-months use was independent of TB type. While with 4-weeks use QHI showed an improvement compared to baseline (each p<0.002), with 6-months use (24 weeks) was no significant difference. Independent of TB type, PBI showed no change compared to baseline at any time with 4-week use; with 6-month use, there was only a significant worsening in Group E (soft/normal head) in week 24 (p=0.02).

**Conclusion:** With increasing wear, the effectiveness of the TB was reduced in terms of plaque removal, and gingival inflammation appeared increasingly. It was not possible to demonstrate the superiority of one of the TB types (hardness/head size).

## Topic: Clinical Research: Periodontal Therapy

**P0336****Effect of the antimicrobial photodynamic therapy in the treatment of the induced periodontal disease in rats.**

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*Araçatuba, Sp/Brazil*

**Aim:** The aim of this study was to evaluate antimicrobial photodynamic therapy (aPDT), using photosensitizers with different concentrations, as an adjunctive therapy to scaling and root planing (SRP) for the treatment of experimentally induced periodontitis in rats.

**Material and Methods:** Periodontal disease was induced through introduction of a cotton thread around the first mandibular molar in 162 rats. After seven days, ligature was removed and animals were divided into nine groups: G1- scaling and root planning (SRP); G2- SRP and irrigation with methylene blue (MB) (100 µg/ml); G3- SRP and irrigation with MB (10 mg/ml); G4- SRP and irrigation with toluidine blue (TBO) (100 µg/ml); G5- SRP and irrigation with TBO (10 mg/ml); G6- SRP and irrigation with MB (100 µg/ml) and Laser; G7-SRP and irrigation with MB (10 mg/ml) and Laser; G8- SRP and irrigation with TBO (100 µg/ml) and Laser; G9- SRP and irrigation with TBO (10 mg/ml) and Laser. The laser used was InGaAlP (660 nm; 4.94 J/cm<sup>2</sup>/point; 24 seconds). Six animals from each group were euthanized at days 7, 15, and 30. The area of bone loss in the furcation region was histometrically analyzed. Data were analyzed statistically (P<0.05).

**Results:** The animals of G1 presented more bone loss (2.17±0.54) compared to animals of G6 (0.55±0.14), G7 (0.77±0.17) and G8 (0.73±0.17) at 7 days (p<0.01).

**Conclusion:** It was concluded that aPDT was effective as an adjunct to SRP in reducing bone loss in periodontitis induced in rats, when used MB (10 mg/ml and 100 µg/ml), and TBO with 100 µg/ml.

## Topic: Clinical Research: Periodontal Therapy

**P0337****Papain in the treatment of chronic periodontitis**

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Rio De Janeiro/Brazil

**Aim:** Subgingival scaling may cause dentin hypersensitivity by excessive removal of cement, leaving residual calculus, whilst the whole root surface cannot be reached. A papain- and chloramine-based gel (Papacárie®) was introduced to remove carious dentin and may help to remove subgingival calculus with reduced consumption of cement. The objective of this study was to verify the effectiveness of a papain- and chloramine-based gel and analyze the root surface in the region associated with subgingival root planning.

**Material and Methods:** Eighteen chronic periodontitis patients (6 women/ 12 men, mean age of 51 years  $\pm$  8) were treated using a split-mouth model. The test treatment was established by applying the gel to the subgingival area for 1 minute, followed by root planning. The control treatment was established by subgingival scaling/root planning. Clinical examinations were performed at baseline, after 1 and 3 months. Four previously untreated teeth with indication for extraction were treated as test and control and analyzed by scanning electron microscopy (SEM) following extraction.

**Results:** After 3 months, there were significant improvements in clinical parameters on test and control sides. However, there were no significant changes between two forms of therapy. The SEM analysis showed that the test treatment left a larger amount of residual calculus on the root surface, but areas free of calculus were also observed. In the control treatment, deeper areas unaffected by the scaling and root planning and areas free of calculus were found.

**Conclusion:** Test and control treatments were effective in the treatment of chronic periodontitis after 3 months.

## Topic: Clinical Research: Periodontal Therapy

**P0338****The Clinical Effect of Different Desensitizing Agent in the Treatment of Dentin Hypersensitivity After Periodontal Therapy**

Ö. Şimşek, A. Uraz, A.B. Bal, Y. Sezgin

Ankara/Turkey

**Aim:** The aim of this study was to evaluate the efficacy of 1.23%NaF-gel, 8%Arginine-CaCO<sub>3</sub> and fluorid-containing varnish on dentine hypersensitivity.

**Material and Methods:** Forty-two subjects were entered into the study. The volunteers with history of dentin hypersensitivity caused by periodontal therapy were selected and required to have at least one teeth with DH. 97 teeth included in this study were randomly divided into three groups: group-1, who received 8%Arginine-CaCO<sub>3</sub>, group-2, who received 1.23%NaF-gel and group-3, who received 11.3 mg fluorine-containing varnish. The clinical indices were recorded at first visit. DH was evaluated by using tactile, air blast, and thermal stimuli. The subject's

response was recorded on the visual analog score (VAS) scale following periodontal therapy at baseline, immediately (Day-0) and one month after the application.

**Results:** The clinical parameters showed no significant differences during experimental period. The results were statistically analyzed, and it was found that fluorine-containing varnish treatment was most effective on DH. Furthermore 8%Arginine-CaCO<sub>3</sub> was more effective than 1.23%NaF-gel at time intervals. Sensitivity score differences between the groups were statistically significant at Day-28. Group-3 exhibited statistically significant reduction in dentin hypersensitivity on three stimuli at baseline to Day-28.

**Conclusion:** It was concluded that fluorine-containing varnish is more effective than 8%Arginine-CaCO<sub>3</sub> and 1.23%NaF-gel.

## Topic: Clinical Research: Periodontal Therapy

**P0339****Hereditary gingival fibromatosis: Report of five cases with a 5-year follow-up**

A. Dilsiz, V. Canakci, M. Yavuz, M. Terzi

Erzurum/Turkey

**Aim:** Hereditary gingival fibromatosis (HGF) is an uncommon oral condition characterized by a slow, progressive overgrowth of the gingiva that surrounds the teeth, resulting in functional and esthetics problems. HGF is most frequently reported to be transmitted as an autosomal dominant trait, however, the disease may be found as an autosomal recessive disorder. HGF is usually symmetrical but may be unilateral and generalized or localized. The aim of this article was to present the clinical and histopathologic features of gingival overgrowth of genetic origin.

**Material and Methods:** Five clinical cases (2 female, 3 male) of gingival fibromatosis were reported and a 5-year follow-up scheduled for periodontal therapy described. The diagnosis of gingival fibromatosis suggested clinically was confirmed by the histopathological study of the gingival tissue. Periodontal treatment consisted of oral hygiene instruction, mechanical debridement and surgical therapy included internal bevel gingivectomy combined with open flap debridement procedures.

**Results:** Hereditary gingival fibromatosis can exhibit various clinical features such as poor oral hygiene, dense coarse gingival tissue, delayed tooth eruption, displacement of teeth, supernumerary teeth, delayed root resorption and anterior open/deep bite. Following the completion of the treatment, no signs of recurrence were observed over 5-year follow-up. The patients and clinicians were satisfied with the result.

**Conclusion:** Combined treatment comprising removal of fibrotic gingival tissue represents a unique treatment approach in periodontal therapy. Five-year follow-up revealed that gingival overgrowth was successfully treated. The dental clinicians should be alert for dental and developmental abnormalities such as supernumerary teeth and delayed tooth eruption.



Topic: Clinical Research: Periodontal Therapy

## P0340

### Odontogenic Cysts of Oral Cavity: Lateral Periodontal Cyst; A case report with a 3-year follow-up

A. Dilsiz, O. Köse, D. Özkal, E. Kermen

Erzurum/Turkey

**Aim:** Lateral Periodontal Cysts are defined as non-keratinized and non-inflammatory developmental cysts located adjacent or lateral to the root of vital teeth. There have been a few cases reported of outcomes of treatment of lateral periodontal cysts. The purpose of this study was to illustrate the case of lateral periodontal cyst in a patient and to describe the successful treatment of this case.

**Material and Methods:** A 19-year-old Turkish boy was referred by his dentist to the periodontology clinic of the Faculty of Dentistry in July 2008, for the treatment of cyst in the lower right premolar region. The diagnosis of lateral periodontal cyst suggested clinically and radiographically was confirmed by the histopathological study. Treatment consisted of oral hygiene instruction, periodontal treatment and enucleation of cyst.

**Results:** Four weeks after surgery healing was occurred and three years later area of the lesion appeared completely normal as clinical and radiographically.

**Conclusion:** The lateral periodontal cyst was treated successfully by surgical treatment.

Topic: Clinical Research: Periodontal Therapy

## P0341

### Effect of supportive periodontal therapy on tooth mortality

H. Um, S. Kim, J. Lee, B. Chang

Gangneung/Korea

**Aim:** The aim of this retrospective study was to evaluate the effect of patient compliance with supportive periodontal therapy (SPT) on tooth loss in Korean adults.

**Material and Methods:** Periodontal records of 134 patients were reviewed for this study. They have completed courses of active periodontal therapy from January 1999 to December 2001, and were placed on schedule of periodic recall visits for SPT. The patients were classified into one of the three groups: complete compliance (CC), erratic compliance (EC), and non-compliance (NC) group. Re-examinations were carried out 11.0±0.8 years after active treatment. Prognosis for each tooth was determined as good, questionable or hopeless according to bone loss by pre-treatment radiographs.

**Results:** The rate of tooth loss of CC group was significantly lower than that of NC group. Tooth loss/patient and tooth loss/patient/year were not significantly different between three groups. For the teeth with good prognosis, the rate of tooth loss of CC group was significantly lower than that of NC. For the teeth with questionable prognosis, CC group showed significantly lower rate of tooth loss than EC or NC group. For the teeth with hopeless prognosis, rates of tooth loss were not significantly different between three groups.

**Conclusion:** The present results suggest that patients having poor compliance with SPT are more likely to lose teeth than regularly compliant patients. However, the risk of tooth loss with hopeless prognosis was high regardless of compliance.

Topic: Clinical Research: Periodontal Therapy

## P0342

### Therapy of a patient with Acute Streptococcal Gingivitis: a case report

A. Dilsiz, S. Akman, N. Ilday, N. Celik

Erzurum/Turkey

**Aim:** Acute streptococcal gingivitis is an acute infection of the oral mucosa. Specific bacterial infections such as neisseria gonorrhea, streptococcal gingivitis and the others are very important, but little attention is given to these diseases because they are rarely seen. The purpose of this study was to report the case of an acute streptococcal gingivitis in a patient and to describe the successful treatment of this case.

**Material and Methods:** The patient was a 20-year old female who presented herself to the Atatürk University, Faculty of Dentistry, Department of Periodontology, with the complaints of pain, refractory gingival reddish, severe bleeding gums on the upper and lower anterior region, and halitosis. The diagnosis of acute streptococcal gingivitis suggested clinical and radiographically was confirmed by the anaerobic-culture technique of the gingival samples. The treatment plan included oral hygiene instruction, non-surgical periodontal therapy (scaling and root planing and dental polishing) and antimicrobial therapy.

**Results:** Healing was uneventful after 14 days at the recall visit. There was no sign of gingival bleeding and reddish. Acute streptococcal infection was responsive to non-surgical periodontal treatment plus systemic antibiotic.

**Conclusion:** The treatment of acute streptococcal gingivitis is of importance because of the possibility of serious complications, which can endanger the systemic health of the patient.

Topic: Clinical Research: Periodontal Therapy

## P0343

### Phototoxic effect of blue light on planktonic and biofilm state of anaerobic periodontal pathogens: in vitro study

H. Song, K. Cho, J. Lee, H. Um

Gangneung/Korea

**Aim:** The purpose of this study was to compare the phototoxic effect of periodontal pathogens in both planktonic and biofilm cultures under blue light exposure.

**Material and Methods:** Strains of *Aggregatibacter actinomycetemcomitans*, *Fusobacterium nucleatum*, *Porphyromonas gingivalis* in planktonic or biofilms state were exposed to visible light at wavelengths of 400-520 nm. Quartz-tungsten-halogen lamp at power densities 500 mW/cm<sup>2</sup> was used for light source. Every sample was exposed to 15, 30, 60, 90 or 120 seconds to

each bacterial strain in planktonic or biofilm state. A confocal scanning laser microscopy (CSLM) was used to observe the distribution of dead/live bacterial cells in biofilms. After light exposure, bacterial killing rate was calculated from colony forming unit (CFU) counts.

**Results:** CLSM images that were obtained from biofilms showed a mixture of dead and live bacterial cells extending to a depth of 30-45 µl. Obvious difference about live/dead bacterial cell ratio was found in *P. gingivalis* biofilm according to light exposure time. In planktonic state, almost all bacteria were killed at 60 seconds of light exposure in *F. nucleatum* (99.1%), at 15 seconds in *P. gingivalis* (100%). In biofilm state, however only *P. gingivalis* demonstrated decreasing tendency of CFU according to increase of light exposure time. And lower efficacy of phototoxicity on *P. gingivalis* biofilm compared to planktonic was found.

**Conclusion:** Blue light exposure using dental halogen curing unit is available for reducing periodontal pathogens in planktonic state. It is recommended to use of adjunctive exogenous photosensitizer when visible light exposed for clinical antimicrobial periodontal therapy.

Topic: Clinical Research: Periodontal Therapy

**P0344**

### The effect of rinsing or drinking water on the Morning Bad Breath

- a single blind randomized clinical trial -

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Amsterdam/Netherlands

**Aim:** The effect of drinking a glass of water as compared to rinsing with water on Morning Bad Breath (MBB) in periodontally and systemically healthy subjects.

**Material and Methods:** The study is a single - blind (examiner) two-arm parallel clinical trial.

In total 50 subjects were recruited and randomly divided into two equal groups. One Group drank 200ml water within 30secs (drink) and another group rinsed with 15ml water for 30secs (rinse). Clinical examination was carried out during one visit, in a time slot between 7.30am and 12am. Pre- and post measurements were assessed with the Halimeter® and Oral Chroma™ evaluation Volatile Sulphur Compounds (VSC), Hydrogen Sulphide (H<sub>2</sub>S), Dimethyl Sulphide ((CH<sub>3</sub>)<sub>2</sub>S) and Methyl Mercaptan (CH<sub>3</sub>SH).

**Results:** All subjects completed the clinical assessments. At pre- and post- measurement, the Oral Chroma™ and Halimeter® readings were not significant different between the groups (*p* >0.05). For both regimens a significant decrease was obtained for the Oral Chroma™ H<sub>2</sub>S and CH<sub>3</sub>SH readings after the intervention. For CH<sub>3</sub>SH both regimens resulted in approximately a 60% reduction, where as for H<sub>2</sub>S, the reduction was between 30-50%. Overall, no difference was noted between the drinking or rinsing group for any of the parameters.

**Conclusion:** Drinking a glass of water or rinsing with 15ml water had a statistically significant effect on the MBB outcome. There was no significant difference between the regimens. The

practical implication of this conclusion is that prior to a MBB examination the use of water should be considered as a variable that will significantly impact the outcome of the assessment.

Topic: Clinical Research: Periodontal Therapy

**P0345**

### IMMUNE MODULATORY AND ANTIOXIDANT EFFECTS OF MELATONIN IN PERIODONTITIS INDUCED RATS

C.F. Canakci, S. Akman, S. Yildirim, H.H. Alp, A. Kara

Erzurum/Turkey

**Aim:** Melatonin is a hormone (N-acetyl-5 methoxytryptamine) synthesis from pineal gland especially in night. Periodontal disease causes of the oxidative stress to periodontal tissues. We aim to investigate the immune modulatory and antioxidant role of melatonin in treatment of periodontitis.

**Material and Methods:** The rat's mandibular first molar teeth were ligatured in submarginal position for 4 weeks to induce periodontitis and then 4 weeks after the ligature was removed. 24 animals were randomly divided into 3 groups (Control, PED, MEL+PED). Therefore, the melatonin administration were applied to only MEL+PED group at a i.p. dose of 10 mg/kg of body weight for 2 weeks in the night.

**Results:** The results of present study suggest that administration of melatonin prevent oxidatively modified DNA and oxidative damages in periodontal tissues. In histologic examination, melatonin administration group collagen density and epithelium structure nearly were similar to control group tissues.

**Conclusion:** According to our data, melatonin has reduced the oxidative damage in the periodontitis-induced rats periodontal tissue via inhibition of inflammatory effects and activate ascorbic acid-mediated glutathione.

Topic: Clinical Research: Periodontal Therapy

**P0346**

### IMMUNE MODULATORY AND ANTIOXIDANT EFFECTS OF MELATONIN IN PERIODONTITIS INDUCED RATS

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**Conclusion:** According to our data, melatonin has reduced the oxidative damage in the periodontitis-induced rats periodontal tissue via inhibition of inflammatory effects and activate-ascorbic acid mediated glutathione.

Topic: Clinical Research: Periodontal Therapy

## P0347

### Retrospective evaluation of non-surgical periodontal therapy in undergraduate education in Switzerland – an extended case series

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Basel/Switzerland

**Aim:** Periodontal treatment conducted by dental students may be a suitable approach for patients with lower socioeconomic status. Objective was to analyse the efficacy of non-surgical treatment of moderate to advanced periodontal diseases in undergraduate education.

**Material and Methods:** In a retrospective analysis, the records of patients treated by undergraduate dental students at the University of Basel, Switzerland, were consecutively screened during February 2010 and October 2011. Patients  $\leq 40$  years of age, treated for moderate to advanced periodontal diseases with complete documentation and at least one reevaluation appointment after non-surgical periodontal treatment were included. Periodontal, medical and socioeconomic variables were analysed.

**Results:** The sample consisted of 19 participants, with 10 women (average age  $34.2 \pm 5.2$  yrs) and 9 men ( $34.2 \pm 5.2$  yrs). Eight patients received an adjunctive antibiotic medication after mechanical instrumentation of the diseased sites. The number of multirrooted teeth did not differ significantly between baseline and the second reevaluation ( $p=0.474$ ). The mean number of sites with probing pocket depth (PPD)  $<5$ mm increased ( $p<0.001$ ), while sites with PPD  $\geq 5$ mm ( $p<0.001$ ),  $\geq 6$ mm ( $p=0.001$ ), or  $\geq 7$ mm ( $p<0.01$ ) decreased significantly between baseline and the second reevaluation.

**Conclusion:** Provided that a systematic periodontal treatment concept is applied, undergraduate dental students were able to improve the periodontal conditions. Particularly patients with low socioeconomic status benefit from non-surgical periodontal treatment in the undergraduate curriculum.

Topic: Clinical Research: Periodontal Therapy

## P0348

### Effect of Melatonin on Epithelial Cell Proliferation and Apoptosis of Periodontal Tissue during Periodontitis

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25240/Turkey

**Aim:** Oxidative stress mediated reactive oxygen species have

an important role for apoptosis of epithelial tissues. Recent studies suggest little knowledge of cellular synthetic activity and proliferation of gingiva epithelial cells. In this study, we aim to investigate potential effects of melatonin in periodontal tissue's proliferation and apoptotic activity during periodontal diseases.

**Material and Methods:** 24 healthy male-rats were selected and divided into three groups (Control, PED and MEL+PED, n:8). PED and MEL+PED group animal's mandibular first molar teeth were ligatured for 4 weeks to induce periodontitis. After the ligature removing melatonin administration started to be given at intra peritoneal dose of 10 mg/kg for 2 weeks. All groups' animals were sacrificed after 2 weeks melatonin administration period and the tissues were removed mandibles were removed.

**Results:** Apoptotic levels were remarkably increased in the melatonin-treated animal sections compared with their respective controls. Bax activity was up-regulated, while bcl-2 activity was down-regulated following melatonin treatment. 8-OHdG was indicated the melatonin has protective effects against the oxidative stress mediated DNA modifications, also PCNA activity and epithelium thickness were increased with melatonin-administration.

**Conclusion:** The results suggested that melatonin treatment induces the apoptosis, prevents DNA damages from oxidative stress and gingival epithelial cell proliferation in periodontal diseases. Gingival epithelial thickening is associated with increased proliferative activity.

Topic: Clinical Research: Periodontal Therapy

## P0349

### Influence of periodontal maintenance on DMF-T and DMF-S over a 10 year follow-up time of SPT

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<sup>1</sup>Heidelberg/Germany, <sup>2</sup>Neuherberg/Germany, <sup>3</sup>Frankfurt/Germany

**Aim:** To assess the influence of supportive periodontal therapy (SPT) on DMF-T and DMF-S in periodontally treated patients during a follow-up time of 10 years.

**Material and Methods:** 136 patients were re-examined after 10 years  $\pm 6$  month of SPT. DMF-T and DMF-S were surveyed and the factors: sex, age, smoking status, diagnosis, Interleukin-1 composite genotype, regularity of SPT, mean GBI and mean PCR, BMI, and educational as well as social status were determined. Differences of DMF-T and DMF-S between start SPT and re-examination after 10 years were calculated and multilevel regression analyses performed to identify factors contributing to decline of DMF-T and DMF-S.

**Results:** 37 patients with moderate chronic periodontitis, 69 with severe chronic periodontitis and 30 patients with aggressive periodontitis could be included (87 women, mean age 54.5 years). Mean difference between first visit for SPT and re-examination on DMF-T was 2.19 (SD 2.94, range 0-20 teeth), mean difference of DMF-S 15.1 (SD 15.8, range 0-88 surfaces). Regression analysis identified regularity of SPT as only factor significantly accounting for preventing elevation of DMF-S ( $p=0.017$ ). Concerning the DMF-T no factor showed significant impact.

**Conclusion:** SPT has a positive influence on avoiding decline

in DMF-S in periodontally compromised patients during a follow-up time of 10 years. For all other included factors no statistically significant impact could be demonstrated.

Topic: Clinical Research: Periodontal Therapy

## P0350

### The clinical effect of scaling and root planing and the concomitant administration of systemic amoxicillin and metronidazole: a systematic review

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<sup>1</sup>Amsterdam/Netherlands, <sup>2</sup>Kansas City/Netherlands

**Aim:** The treatment of periodontitis frequently begins with a non-surgical phase that includes scaling and root planing (SRP) and, on occasion, the use of systemic antibiotics. The goal of this review was to systematically evaluate the data concerning the effect of the concomitant administration of amoxicillin and metronidazole adjunctive to SRP in otherwise healthy adults.

**Material and Methods:** The PubMed-MEDLINE, Cochrane-CENTRAL and EMBASE data bases were searched through 15 September 2011 to identify appropriate studies. Probing Pocket Depth (PPD), Clinical Attachment Level (CAL), Bleeding on Probing (BOP) and Plaque Index (PI) were selected as outcome variables. Based on the extracted mean values and number of subjects, weighted means changes were calculated and a meta-analysis conducted.

**Results:** The search yielded 504 unique titles and abstracts. Ultimately, 29 papers were selected, describing 23 clinical trials meeting the eligibility criteria. The full-mouth weighted mean change for PPD showed an improvement of 1.41 mm. The full-mouth weighted mean change for CAL showed a gain of 0.91 mm.

**Conclusion:** From this review it is concluded that systemic anti microbial therapy using a combination of amoxicillin and metronidazole as an adjunct to SRP can enhance the clinical benefits of non-surgical periodontal therapy in otherwise healthy adults.

Topic: Clinical Research: Periodontal Therapy

## P0351

### The Adjunctive Chlorhexidine Mouthrinse in Untreated Plaque-associated Gingivitis: Effect on Gingival Crevicular Fluid MMP-8 and TIMP-1 Levels

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<sup>1</sup>Izmir/Turkey, <sup>2</sup>Helsinki/Finland

**Aim:** To examine the effectiveness of chlorhexidine mouthrinse (CHX) in addition to daily plaque control on both gingival inflammation and gingival crevicular fluid (GCF) MMP-8 and TIMP-1 levels in patients with untreated plaque-associated gingivitis.

**Material and Methods:** Fifty gingivitis patients were randomized to CHX or placebo groups. In addition to daily plaque control, CHX group rinsed with CHX, while placebo group rinsed with

placebo mouthrinse for 4 weeks. GCF samples were collected and clinical periodontal parameters including plaque index, papillary bleeding index, calculus index and probing depth were recorded at baseline and repeated at 4 week. Enzyme-linked immunosorbent assay was used to determine the MMP-8 and TIMP-1 levels in GCF.

**Results:** Whole mouth clinical parameters were significantly improved in both groups at 4 weeks. CHX group showed greater reduction in the mean PI scores than placebo group at 4 weeks ( $p < 0.05$ ). In both groups, GCF MMP-8 levels at 4 weeks were not significantly different from baseline levels ( $p > 0.05$ ). GCF TIMP-1 levels in both groups increased at 4 weeks compared to baseline ( $p < 0.05$ ). The alterations of GCF MMP-8 and TIMP-1 levels in CHX group was not significantly different than those of placebo group at 4 weeks.

**Conclusion:** CHX mouthrinse as adjuncts to daily plaque control did not have any effect on GCF MMP-8 and TIMP-1 levels. Although CHX mouthrinse had suppressive effect on accumulation of dental plaque, no beneficial effect of CHX could be shown on studied GCF biomarkers.

Topic: Clinical Research: Periodontal Therapy

## P0352

### The Effect of Cigarette Smoking on Gingival Crevicular Fluid MMP-2 and MMP-9 Levels in Chronic Periodontitis Patients

B. Tekin, M. Gürsel, S. Haliloğlu

Konya/Turkey

**Aim:** The aim of this study was to evaluate the effect of cigarette smoking on gingival crevicular fluid (GCF) matrix metalloproteinase (MMP)-2 and MMP-9 levels in chronic periodontitis patients.

**Material and Methods:** The study population consisted of smokers and non-smokers aged  $\geq 35$ , 39 volunteers, 4 females and 35 males, who were diagnosed with chronic periodontitis. Before non-surgical periodontal treatment, probing depth (PD), clinical attachment level (CAL), plaque index (PI) and gingival index (GI) were recorded. GCF samples were obtained from the four deepest pockets of all patients. Following baseline measurements and GCF sampling non-surgical periodontal treatment including scaling and root planning (SRP) was performed on all patients. Clinical measurements and GCF sampling were repeated in 1st, 3rd and 6th months following non-surgical periodontal treatment. GCF MMP-2 and MMP-9 levels were determined by ELISA method.

**Results:** Statistical analyses of data revealed that non-surgical periodontal treatment improved clinical parameters ( $p < 0.05$ ). After treatment, GCF MMP-2 and MMP-9 levels reduced in the cigarette smoking and non-smoking groups ( $p < 0.05$ ) but MMP-2 and MMP-9 total amounts in both groups were not different statistically ( $p > 0.05$ ). But the concentration amounts of MMP-9 were different in 1st and 3rd months ( $p < 0.05$ ). The concentration amounts of MMP-2 were not different ( $p > 0.05$ ).

**Conclusion:** Within the limitations of the present study, it can be concluded that non-surgical periodontal treatment has been effective in smoking and non-smoking chronic periodontitis patients but smoking has not been effective on levels of GCF MMP-2 and MMP-9.



## Topic: Clinical Research: Periodontal Therapy

**P0353****Retrospective Analysis of Three Parameters on the Outcome of Periodontal Therapy**S.B. Maisch<sup>1</sup>, F. Faber<sup>2</sup>, I. Nergiz<sup>1</sup>, U. Platzer<sup>1</sup>, P. Schmage<sup>1</sup><sup>1</sup>Hamburg/Germany, <sup>2</sup>Köln/Germany

**Aim:** This retrospective study aimed to evaluate the outcome of periodontal therapy of undergraduate students regarding the effects of the parameters local anesthesia, antibiotics and amount of appointments.

**Material and Methods:** The treatment outcome of periodontal therapy performed by dental students has been studied retrospectively over six years. 167 patients with 3951 teeth fulfilled the including criteria. One tooth of each group (anterior teeth, premolar, molars) of each patient was selected in a random procedure (n=883). The respectively deepest pocket probing depths (PPD) of each tooth was taken. Differences of PPD were formed between initial and final measurements. 93 of the patients received local anesthesia and 16 patients got antibiotics on the basis of a microbiological test. The amount of appointments for therapy was counted. Statistical analysis was carried out (ANOVA, Duncan post-hoc-test,  $\alpha=0.05$ ).

**Results:** Anesthesia had a significant influence on the PPD differences. Pockets with initial PPD of 4-5mm were reduced 0.89mm with anesthesia/ 0.81mm without and for initial PPD >6mm 2.24mm with anesthesia/ 1.96mm without. Additional antibiotic therapy revealed a highly significant effect ( $p < 0.0001$ ) on the reduction of PPD. Pockets with an initial PPD of 4-5mm were reduced 0.92mm with antibiotics/ 0.84mm without and for initial PPD >6mm 2.77mm with anesthesia/ 2.01mm without. The treatment was significantly ( $p < 0.008$ ) more successful when more than one appointment took place (PPD reduction 1 appointment: 1.18mm $\pm$ 1.12mm, 2-4 appointments 1.68mm $\pm$ 1.66mm).

**Conclusion:** Periodontal treatment is more effective if carried out over several appointments and with the application of local anesthesia. The effect of taking antibiotics where indicated was proved.

## Topic: Clinical Research: Periodontal Therapy

**P0354****Influence of regular intake of Periobalance® lozenges on plaque control and gingivitis in pregnant women.**

L. Kleinhans, Y. Jockel-Schneider, M. Rehn, U. Schlagenhauf

Wuerzburg/Germany

**Aim:** This investigation was designed to evaluate the influence of regular consumption of Periobalance® lozenges, containing probiotic *L. reuteri* strains, on plaque scores and gingivitis in pregnant women during the third trimester of pregnancy.

**Material and Methods:** 45 pregnant women seeking routine gynecological examinations at the end of the second trimester of pregnancy gave informed consent for study participation. At baseline Plaque Index (PII) and Gingival Index (GI) scores were recorded for teeth 16, 21, 24, 36, 42, 44. Applying a randomized double-blind placebo-controlled test design each study subject

received a total of 240 lozenges (test or placebo) to be consumed twice daily until reevaluation, scheduled to be performed within 3 days after delivery.

**Results:** For the test group a significant reduction of mean PII-score (1.29 $\pm$ 0.55 to 0.42 $\pm$ 0.51;  $p < 0.0001$ ) and mean GI-score (1.46 $\pm$ 0.66 to 0.54 $\pm$ 0.59;  $p < 0.0001$ ) between baseline and reevaluation was observed. For the placebo group differences in recorded mean PII scores (1.29 $\pm$ 0.64 to 1.05 $\pm$ 0.74; n.s.), and mean GI scores (1.24 $\pm$ 0.63 to 1.10 $\pm$ 0.63; n.s.) could not be verified statistically.

**Conclusion:** In this pilot study focusing on pregnant women the regular consumption of probiotic Periobalance® lozenges resulted in significantly improved plaque control and significantly lower gingival inflammation and may thus warrant further investigations.

## Topic: Clinical Research: Periodontal Therapy

**P0355****Ten-year follow-up of an apparently hopeless tooth with occlusal trauma: a case report**

H. Jia

Beijing/China

**Aim:** The present case report describes a 10-year follow-up of functional rehabilitation of a 50 year old patient with advanced chronic periodontitis and occlusal trauma in right mandibular premolar by comprehensive periodontal therapy combined with endodontic therapy.

**Material and Methods:** After initial periodontal therapy including full-mouth scaling and root planning, occlusal adjustment and endodontic treatment was completed on 45#. After healing for 9 months, 45# was fixed using fiber-reinforced composite splint, and an open flap debridement surgery was completed. One month later, a free gingiva graft surgery was conducted to increase keratinized gingiva and achieve root coverage.

**Results:** Clinical and digital subtraction imaging evaluation at 6-year recall revealed shallow residual probing pocket depth (3mm) and evident bone gain. Clinical outcome of 10-year maintenance showed functional and periodontal stability.

**Conclusion:** The present case report indicates that predictable long-term effect could be accomplished and maintained in apparently hopeless tooth through comprehensive and individualized periodontal treatment.

## Topic: Clinical Research: Periodontal Therapy

**P0356****Osseous resective surgery. Use of rotatory instruments versus piezoelectric instruments. Clinical and biomolecular study. RCT split-mouth**

A. Graziano, F. Ferrarotti, M. Gambone, L. Cricenti, F. Piccolo, M. Aimetti

Turin/Italy

**Aim:** Aim of the study was to investigate the healing after ORS in patients with chronic periodontitis. We performed clinical and biomolecular analysis.

**Material and Methods:** Eight patients was treated with split-mouth ORS. One surgery was treated with manual and rotatory instruments and the other with piezoelectric instruments. Probing pocket depth (PPD), clinical attachment level (CAL), gingival recession (REC) were recorded at baseline and at 1, 3, 6, 12 months after surgery. Levels of Interleukin 1 $\beta$  were recorded before the surgery and after one week.

**Results:** Before piezoelectric surgery PPD was 3,76 $\pm$ 0,60 mm and REC 0,71 $\pm$ 0,54 mm; after 1 year PPD was 2,08 $\pm$ 0,27 mm and REC was 1,95 $\pm$ 0,59 mm. Before traditional surgery PPD was 3,57 $\pm$ 0,82 mm and REC 1 $\pm$ 0,94 mm; after 1 year PPD amounted to 2,19 $\pm$ 0,18 mm and REC was 2,05 $\pm$ 0,4 mm. PCR showed lower levels of IL-1b mRNA transcripts after piezoelectric surgery.

**Conclusion:** Clinical outcomes with piezoelectric instruments were comparable with manual and rotatory for clinical results; on the other hand the first sites showed lower levels of IL1 $\beta$ . These data could suggest the use of piezoelectric instruments in site exposed to higher post-surgical osteoclastic activity.

Topic: Clinical Research: Periodontal Therapy

## P0357

### Clinical outcome after non surgical periodontal therapy with an Er:YAG laser device: a randomized clinical study.

Z. Badran<sup>1</sup>, X. Struillou<sup>1</sup>, H. Boutigny<sup>2</sup>, A. Soueidan<sup>1</sup>

<sup>1</sup>Nantes/France, <sup>2</sup>Lille/France

**Aim:** Compare scaling and root planning (SRP, manual) and Er:YAG laser debridement (ERL) in randomized clinical study.

**Material and Methods:** 23 non smoker patients (12 men and 11 women, mean age: 60,7) with chronic generalized periodontitis were selected. During the study, 4 patients were excluded (n=19) for not attending the reevaluation visit. Controlled, split mouth design and Patient's randomization was carried using sealed envelopes containing the treatment procedure for the first quadrant. Clinical parameters evaluated: clinical attachment level (CAL), pocket depth (PD) and bleeding on probing.

**Results:** A significant reduction of CAL for both groups was found when compared to respective baseline scores (p<0.001). At reevaluation, a significant reduction of CAL for the ERL group was found when compared to SRP (p<0.004). For periodontal pocket depth, The comparison of the two treatment modalities showed a slight non significant reduction of PDP (p=0,07) for the ERL group when compared to the SRP group. BoP reduction for the ERL group was not significant when compared to SRP group.

**Conclusion:** Within the limit of this study, ERL could be an alternative to mechanical treatment in the management of chronic periodontitis. Also, the ERL could be performed without the use of injectable anesthetics. Future studies, with a larger study population, are needed to determine the clinical outcome of ERL on the long-term.

Topic: Clinical tips and cases: Surgical therapy

## P0358

### Mandibular infected buccal cyst: A case report

T. Hoffmann, I. Jachmann

Dresden/Germany

**Aim:** Introduction The mandibular infected buccal cyst is a rare type of inflammatory cyst. It occurs in children aging from 6 to 11 years. It is an uncommon lesion associated with a partial eruption of the permanent mandibular first or second molar. The World Health Organization has included this lesion in their histologic typing of odontogenic tumours.

**Material and Methods:** Case report A 9-year-old boy presented with local suppurative buccal from his lower left first molar showing no pain or swelling. Probing depths on the surfaces of tooth 36 were 12 mm mid-buccal and disto-buccal. No clinical caries was noted on this tooth, which also presented vital to thermal testing. Surgical treatment was proposed. A full-thickness flap was elevated on the buccal aspect of tooth 36. A small, soft-tissue-filled space was found. The lesion was enucleated and submitted for histopathologic evaluation. The flap was repositioned and sutured. The histological findings showed parts of an odontogenic cyst.

**Results:** Discussion Most of the reported cases of mandibular infected buccal cyst involve the mandibular permanent first or second molars. While most cases occur unilaterally, bilateral cyst have also been reported. In the case of the first molars, a buccal or distal location is most common. The majority of dental abscesses in children results from caries or trauma. A minority originate from unusual conditions. However, knowledge of these conditions will enable the general practitioner to diagnose and easily treat these entities.

**Conclusion:** Conclusion The mandibular infected buccal cyst can be treated successfully by simple enucleation without disturbing the associated tooth.

Topic: Clinical tips and cases: Surgical therapy

## P0359

### verruciform xanthoma in a severe context of phenytoin induced gingival overgrowth: a case report

A.N. Al-Kaissi

Riyadh/Saudi Arabia

**Aim:** Phenytoin was involved in drug induced gingival overgrowth, with a prevalence rate reaching 50%. In this case report showing a severe context of gingival enlargement, we noted the emergence of a rare oral lesion. The aim of this report is to explain the need to differentiate this lesion from classical hyperplasia.

**Material and Methods:** A 23-year-old man presented with an advanced case of gingival overgrowth due to prolonged intake of phenytoin. Oral examination showed a total coverage of the tooth structure, fibrotic gingival tissue, and some unusual cauliflower-like lesions. A surgical treatment was performed, and a biopsy was taken from the suspected area. Histopathological examination revealed the diagnosis of verruciform xanthoma (VX). No recurrence of the disease was evidenced after six months of therapy.

**Results:** Since 1971, only 355 cases of oral VX were reported, this report being the first one with phenytoin induced hyperplasia. We are thus questioning the possibility of a tumorigenic implication in this type of degenerative epithelial phenomenon, and enhanced connective tissue mitotic activity. The most relevant differential diagnosis of VX is squamous cell carcinoma, which needs to be detected as early as possible. The clinical features of VX are nonspecific, and the variation in the clinical appearance of these lesions and its rarity are factors making its clinical recognition problematic. Though no malignancy has been reported, it could be a potentially premalignant lesion.

**Conclusion:** Oral hygiene, recall maintenance visits, sense of observation, and histology testing are all important factors that should be considered in cases of drug induced gingival enlargement.

Topic: Clinical tips and cases: Surgical therapy

### P0360

#### Periodontal surgical treatment and osteoporosis therapy

J. Leusic Temmer, V. Njemirovskij  
Zagreb/Croatia

**Aim:** The aim of the study is to determine the factors contributing to a better outcome of chronic periodontitis therapy in menopausal women with osteoporosis. The treatment of the choice was both: periodontal and surgical.

**Material and Methods:** A study group consisted of 44 women with clinical signs and symptoms of chronic periodontitis and osteoporosis. All patients were under osteoporosis therapy and came to clinic for periodontal treatment. Total of 21 women were under hormonal therapy (HRT) and 23 women received Bisphosphonate therapy. The first stage of periodontal treatment included initial therapy I, followed by initial therapy II. Reevaluation followed by regenerative periodontal and surgical treatment in which a „Bio-oss“ xenogenic osseous implant and a resorbing „Bio-gide“ (Geislich) membrane were used. Computer assisted radio densitometry measurements of surgical regions were carried out prior to the surgical treatment and also six months, a year and three years after the treatment. In order to confirm the osteoporosis diagnosis bone densitometry was carried out by the use of the DXA technique in the L1- L4 spinal region as well as in the proximal femur region.

**Results:** Densitometric measurements of mineral density of surgical periodontal treated region confirmed: the mineral density of bone increased by women using HRT after six months to one year. In comparison with women receiving Bisphosphonate therapy where mineral density of bone increased after one year more than in women receiving HRT.

**Conclusion:** Bisphosphonate therapy in women with osteoporosis gave better results after periodontal surgical treatment.

Topic: Clinical tips and cases: Surgical therapy

### P0361

#### The complications of the cryosurgery treatment of the gingival melanin pigmentation

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Ankara/Turkey

**Aim:** Gingival melanin pigmentation (GMP) is considered to be a physiological or ethnical situation. Complaints of “black gums” are common, and demand for depigmentation is usually made for esthetic reasons. The present case was undertaken to compare the effectiveness and complications cryosurgery. There are air-flow, abrasion with abrasive materials, mucosal flap, laser, electrosurgery and cryosurgery for GMP applications.

**Material and Methods:** A female systemically healthy patient, 40 years old visited the department with aesthetical problems about GMP. After clinical examination depigmentation procedure was planned. Cryosurgery was carried out approximately 30 seconds by cross segments from canine to canine from the mid-line for the treatment of maxillary and mandibular gingiva. Portable cryo device for dermatological use (Brymill Cry-Ac liquid nitrogen unit; Brymill Cryogenic Systems, Ellington, Connecticut) and liquid nitrogen as cryogen were employed.

**Results:** No complication was observed about healing after depigmentation with air abrasion site and upper cryosurgery site. Conversely, on the right lower segment which was treated by cryosurgery, severe pain, swelling, redness on soft tissue were observed and superficial bone necrosis became apparent within a week. Sequestrum was removed by a tissue forceps and secondary healing was occurred with causing attachment loss.

**Conclusion:** Based on methods such as cryosurgery seem to be effective on the treatment of melanin depigmentation. Various complications can be observed on the application of cryosurgical procedures. Anatomical structures of the pigmented sites, the width of the gingiva, the length of the keratinized gingiva, dose and application distance of cryogenic gas must be considered carefully.

Topic: Clinical tips and cases: Surgical therapy

### P0363

#### Surgical correction of excessive gingival enlargement-case series

I. Gera, A. Agics, E. Hulik  
Budapest/Hungary

**Aim:** Introduction: Several conditions can lead to excessive gingival enlargements. To day the most common form is the drug related gingival hyperplasia - nevertheless the heredity localized or generalized gingival fibromatosis can also occur and might impose a challenge to gingival surgery. Case report: The first case is a very severe antihypertensive drug related gingival overgrowth in a 62 years old man interfering with the closure of his lip corrected with a combination of conventional gingivectomy and internal reverse bevelled incision. The second case is a drug related gingival overgrowth in a young kidney transplant woman who took both Cyclosporin-a and Ca-channel blockers. The excessive mass of fibrotic tissue was removed by a series of internal

bevelled incision and the oral and buccal gingival flaps were united with sutures. The healing was uneventful and during the follow up patients compliance and oral hygiene was superb. The third case is a 23 years old young women with excessive symmetric tubular fibrosis interfering with her berthing and swelling. The fibrotic tissue was removed with conventional gingivectomy technique but the profound bleeding from the palatal veins needed several mattress sutures to strangulate the veins. Discussion and conclusion : Today the more conservative internal bevelled incision is preferred over the conventional gingivectomy in the most cases because it provides a more predictable healing and better esthetics. The recurrence of the drug related gingival hyperplasia can be anticipated by meticulous postoperative individual oral hygiene and regular supportive therapy.

**Material and Methods:** Case report: The first case is a very severe antihypertensive drug related gingival overgrowth in a 62 years old man interfering with the closure of his lip corrected with a combination of conventional gingivectomy and internal reverse bevelled incision . The second case is a drug related gingival overgrowth in a young kidney transplant women who took both Cyclosporina-a and Ca-channel blockers. The excessive mass of fibrotic tissue was removed by a series of internal bevelled incision and the oral and buccal gingival flaps were united with sutures. The healing was uneventful and during the follow up patients compliance and oral hygiene was superb. The third case is a 23 years old young women with excessive symmetric tubular fibrosis interfering with her berthing and swelling. The fibrotic tissue was removed with conventional gingivectomy technique but the profound bleeding from the palatal veins needed several mattress sutures to strangulate the veins.

**Results:** Discussion Today the more conservative internal bevelled incision is preferred over the conventional gingivectomy in the most cases because it provides a more predictable healing and better esthetics. The recurrence of the drug related gingival hyperplasia can be anticipated by meticulous postoperative individual oral hygiene and regular supportive therapy.

**Conclusion:** The combined conservative and surgical therapy leads to predictable postoperative result

Topic: Clinical tips and cases: Surgical therapy

**P0364**

### **Surgical Treatment of severe chronic localized periodontitis in a 17-year-old subject - case presentation**

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<sup>1</sup>Prishtina, Kosovo/Albania, <sup>2</sup>Peja Kosovo/Albania

**Aim:** Localized chronic periodontitis is a disease of teeth supporting tissues characterized with the presence of periodontal pockets, increased mobility and pathological migration. The increase of the mobility occurs due to bone loss over longer period of time, with unfavorable prognosis.

**Material and Methods:** Patient AB, age 17, was treated with antibiotics for inflammatory changes in teeth 11 and 21. The mobility score for tooth 21 was 2 and for tooth 11 was 1, according to Miller's mobility index. After recovery to the chronic stage, modified Widman's flap surgery of this region was performed in the affected region in order to remove the pathological changes.

**Results:** The postsurgical period showed improvement of periodontal health, including the gingival appearance and tooth mobility. The probing depth has reduced, while the crown height has increased as a result of gingival recession with preserved symmetry in both teeth.

**Conclusion:** Surgical treatment of the periodontal disease in cases of early onset during adolescence may serve as a beneficial strategy on disease progression slack, as subjects of this age timely become aware of the disease and tend to give more effort on further preventive measures.

Topic: Clinical tips and cases: Surgical therapy

**P0365**

### **Hereditary Gingival Fibromatosis - a case report**

H.G. Pinto, A.R. Tavares, H. Rebelo

Lisboa/Portugal

**Aim:** Introduction: Hereditary gingival fibromatosis (HGF) is a rare disease characterized by progressive augmentation of the gingival tissue, with varying degrees of severity. It can occur as an isolated entity or associated with various syndromes and transmission generally adopts an autosomal dominant pattern. This clinical poster aims to discuss the diagnosis and treatment of gingival overgrowth in a young boy due to HGF.

**Material and Methods:** Case report: A 15-year-old boy was referred due to general overgrowth of gingival tissue. The oral examination revealed the presence of partially covered permanent teeth, retention of deciduous teeth, widespread diastema and malpositioned teeth. Radiographic examination excluded agenesis and confirmed retention of two permanent teeth. Among the family members, the father and a younger brother showed manifestations of the same condition. The treatment consisted on plaque control and surgery with reverse bevel flap incisions, full thickness flaps, osteoplasty and apically positioned flaps in the upper jaw and mandible. The postoperative course was uneventful. Histological examination confirmed the widespread increase of collagen fibers. Follow-up appointments after 6 and 12 months showed no recurrence. The patient was referred to orthodontic treatment.

**Results:** Discussion: The diagnosis of HGF in this case was done due to the clinical manifestations of gingival overgrowth together with the family history, as described in the literature. The resective treatment was successful through 12 months follow-up and the orthodontic treatment should solve other esthetical and functional complaints.

**Conclusion:** The diagnosis of HGF and its treatment at an early age can improve patients' quality of life.

Topic: Clinical tips and cases: Surgical therapy

**P0366**

### **Successful treatment of a radicular Groove: an endo-perio treatment – a case report**

A. Keles, A. Eltas

Malatya/Turkey

**Aim:** To present the successful endodontic and periodontal



management of a maxillary lateral incisor tooth with a complex radicular lingual groove and severe periodontal destruction.

**Material and Methods:** A 21-year-old female patient presented with a chief complaint of mobility and discharge of pus in an upper front tooth. Clinical examination revealed a sinus tract on the labial gingival surface and a 11-mm-deep periodontal pocket associated with maxillary left lateral incisor tooth. On the palatal side, a groove emerging from cingulum, continuing distoapically down the palatal aspect of tooth was found. Intraoral periapical radiographs demonstrated that the groove was associated with deep local pocketing resulting in pulp necrosis and the formation of a periodontal-endodontic lesion. A combination of endodontic and periodontal therapy was used. After endodontic treatment of the affected tooth, periodontal surgery was performed. Tungsten-carbide burs, ultrasonic scaler and hand curettes were used to reduce and plane the groove. Mineral trioxide aggregate was condensed prepared cavity. Periodontal surgery was completed, which included the bony defect was filled with a deproteinized cancellous bovine bone (Bio-Oss), and a resorbable collagen membrane (BioGide) was used to cover the graft material.

**Results:** At 8-month follow-up, the patient was comfortable and complete resolution of the periapical pathology was evident.

**Conclusion:** Deep radicular grooves can predispose to pulp necrosis and the establishment of combined periodontal-endodontic lesions. Evaluation of clinical signs and appropriate diagnostic tests are of paramount importance in order to prevent incorrect diagnosis and treatment.

Topic: Clinical tips and cases: Surgical therapy

## P0367

### Evaluation of the quality of life in patients with moderate to severe chronic periodontitis before & after periodontal surgery

N. Sargolsaie, A. Moeintaghavi  
Mashhad/Iran

**Aim:** Although periodontal diseases are not life-threatening, these diseases not only affect eating and speaking, but also affect interpersonal communications, daily activities and quality of life. Evaluating the quality of life before and after surgical treatment in patients with moderate to severe chronic periodontitis was the aim of this study.

**Material and Methods:** This was a clinical trial performed on 90 patients who referred to the Periodontology Department of Mashhad Dental School or private offices. The common complaint of these patients was suffering from moderate to severe chronic periodontitis which required full- mouth periodontal surgery. The items of the OIDP questionnaire were asked by a trained interviewer. In this questionnaire, there are questions about daily schedule of a person such as eating and speaking (according to appendix). For each of these effects, frequency and severity (qualitative data) are expressed as a quantitative data. Sum of different scores resulted from each of the performances were stated as the OIDP score of the person.

**Results:** 95% of patients expressed negative effect of periodontal disease at least about one question on their quality of life before surgery. The Changes in OIDP percentage before and one month after surgery were statistically significant. changes were seen in behaviors such as eating, cleaning of teeth, communication with

others, and the mental comfort of patient. The differences in the sex, occupation, residency and education were not statistically significant.

**Conclusion:** According to the results of this study, periodontal surgery can increase the quality of life in patients suffering from moderate to severe chronic periodontitis.

Topic: Clinical tips and cases: Surgical therapy

## P0368

### Improved early healing of connective tissue graft donor sites after single incision vs. trap door harvesting

S. Fickl, K. Fischer, Y. Jockel-Schneider, M. Bechtold, U. Schlagenhauf  
Würzburg/Germany

**Aim:** To compare wound healing and patient morbidity of single incision (single-incision, modified single-incision) and trap-door surgical techniques to harvest subepithelial connective tissue grafts (SCTG) from the palate.

**Material and Methods:** 36 patients were selected for root coverage procedures with SCTG's and randomly assigned to two single incision or a trap-door group (n=12 each). One week after surgery, a modified early wound-healing index (EHI), discomfort and pain killer intake was recorded. Follow-up was performed until complete epithelialization was achieved.

**Results:** Single incision techniques showed significantly improved early healing over trap-door approaches. Specifically, the mean EHI was  $2.50 \pm 1.14$  for single incision techniques, as compared to  $3.33 \pm 1.30$  for trap-door. The incidence of secondary healing was significantly lower in the single incision groups. Concomitantly, amount and duration of painkiller intake were significantly reduced, as compared to the trap door group.

**Conclusion:** Single incision techniques lead to significantly improved early healing and reduced patient discomfort after subepithelial connective tissue graft harvesting than trap-door techniques.

Topic: Clinical tips and cases: Surgical therapy

## P0369

### A Rare Case of Undifferentiated Pleomorphic Sarcoma of the Gingiva

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Istanbul/Turkey

**Aim:** Undifferentiated pleomorphic sarcoma (UPS) was first described by O'Brien in 1964. It tends to occur in extremities of elderly patients. They appear as deep-seated, progressively enlarging masses. About 5% of patients exhibit distant metastases, mostly to the lungs. Head and neck region UPS are 1% to 3% of the cases and they are likely high-grade tumors.

**Material and Methods:** In October 2009, a 30 years old male patient applied to his dentist because of a gingival swelling in the mandibular incisors area. A gingivectomy has been performed. Nine months after the initial treatment the patient applied to

the Department of Periodontology, complaining about a mass on the buccal side of the left mandibular canine. He had no history of systemic disease and medications, smoked app 20 cigarettes per day, and his oral hygiene was poor. There were no specific radiographic or hemathological findings. It has been decided to make an incisional biopsy of the mass which was slightly ulcerated. The cytopathological result was "undifferentiated pleomorphic sarcoma with rabdomyal differentiation". The patient has been transferred to the Department of Plastic and Reconstructive Surgery. The subsequent treatment was partial mandibulectomy with bilateral neck dissection and adjuvant chemo- and radiotherapy. Thirteen months after surgery, lung metastasis appeared and the patient died in less then two months.

**Results:** This rare type of malignancy is very aggressive and easily misdiagnosed.

**Conclusion:** In patients with unspecific clinical findings of a mass or unidentified gingival enlargement a biopsy must be immediately performed.

Topic: Clinical tips and cases: Surgical therapy

### P0370

#### Evaluation of transplantation on mandibular premolars

D. Yaman, F. Vural, C. Isler, I. Dogan, K. Demirel

*Istanbul/Turkey*

**Aim:** Dental auto transplantation is widely viewed as a reliable treatment option for the replacement of missing wisdom teeth. However, there is a great amount of variation in the reporting of survival rates in relevant studies, and the application of the method on other types of teeth, especially mandibular premolars, remains limited. The aim of this case is to evaluate the clinical and radiographic results of auto transplantation of impacted mandibular premolars.

**Material and Methods:** A 28 year-old woman applied to our clinic with a complaint of missing mandibular premolars on her left side in lower jaw. During clinical and radiographic examination, two impacted premolars and one missing first molar were identified on the third quadrant. Impacted premolars were extracted and re-implanted into the same region after going through endodontic treatment during surgery. After auto transplantation and adjusting the teeth free of any occlusal contact, the flaps were replaced and sutured.

**Results:** Radiography was taken after 6 months and neither tooth mobility nor root resorption were observed in the transplanted teeth. The teeth were considered as possible abutments for the prospective fixed prosthesis. Consequently, the patient underwent prosthetic treatment.

**Conclusion:** Present findings of this case are supportive of relevant literature in that auto transplantation can be suggested as a promising treatment modality.

Topic: Clinical tips and cases: Surgical therapy

### P0371

#### Periodontal Treatment of Chronic Periodontitis Accompanied by Severe Gingival Enlargement

T. Sümer, L. Kuru, S. Yildirim, B. Kuru

*Istanbul/Turkey*

**Aim:** Chronic periodontitis is a disease consisting of chronic inflammation of the gingiva and adjacent attachment apparatus that is caused by accumulation of microbial dental plaque.

**Material and Methods:** This case presents nonsurgical and surgical periodontal treatments and 1 year follow-up of a 38 year-old systemically healthy female patient who was diagnosed as chronic periodontitis accompanied by severe gingival enlargement. She applied to our clinic with complaints of overgrown gingiva, spontaneous gingival bleeding, severe halitosis, difficulty in chewing and speaking, and poor appearance. Intraoral and radiographic examinations revealed highly inflamed and enlarged gingiva along with vertical and horizontal bone loss. Clinical periodontal parameters were recorded, oral hygiene instruction was given and nonsurgical periodontal therapy including scaling and root planing was conducted with adjunctive use of systemic antibiotic. Surgical treatment consisted of flap operations using the combination of enamel matrix derivatives and bovine bone graft. The patient was followed up for 1 year with 3 months recall intervals. Substantial reductions in plaque index, gingival index, probing depth and gingival enlargement score and significant gain in attachment level were observed after therapy.

**Results:** While nonsurgical treatment resulted in resolving inflammation, thereby diminishing soft tissue enlargement and halting hard tissue destruction, regeneration of lost periodontal structures was enhanced by combined surgical procedures.

**Conclusion:** In this case of chronic periodontitis accompanied by severe gingival enlargement, nonsurgical treatment followed by regenerative periodontal surgery resulted in improvements in periodontal clinical parameters, function and aesthetics which maintained throughout the follow-up period.

Topic: Clinical tips and cases: Surgical therapy

### P0372

#### The Effect of Regenerative Periodontal Therapy on Clinical Parameters and GCF IL-8, IL-17 and sICAM-1 Levels in Chronic Periodontitis

E. Olgun Erdemir, T. Apan, M. Hendek, S. Demirer

*Kırkkale/Turkey*

**Aim:** Inflammation of periodontal tissues during post-operative wound healing is mediated by some molecules. The present study has evaluated the effect of regenerative periodontal therapy on clinical parameters and gingival crevicular fluid (GCF) contents of IL-8, IL-17 and sICAM-1 in subjects with chronic periodontitis.

**Material and Methods:** The study population included 20 patients. All patients received oral hygiene insructions, scaling and root planing and to the site of defect demineralized freeze

dried bone allograft placed with flap operation. Pocket depth (PD), clinical attachment level (CAL), plaque index (PI) and gingival index (GI) were recorded and GCF samples were collected. At the 6th and the 9th months these procedures were repeated.

**Results:** 15 patients completed the study period. The volume of GCF decreased from initial to the 6th and the 9th month ( $p < 0.05$ ). When the clinical parameters were evaluated, except PI, all parameters decreased from initial to the 9th month ( $p < 0.05$ ).

**Conclusion:** The regenerative periodontal therapy improved the clinical outcome in subjects with chronic periodontitis and was effective on the volume of GCF, but any effect was observed on the total amount of IL-8, IL-17 and sICAM-1.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

### P0373

#### New surgical approach for root coverage of localized gingival recession: a case series

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Ankara/Turkey

**Aim:** Various coronally repositioned flap (CRF) techniques have been proposed for coverage of gingival recession defects. The aim of present article was to evaluate the effectiveness of a modification of the new CRF procedure without any releasing incision for treatment of localized gingival recession defects.

**Material and Methods:** Method: Seven patients with seven Miller Class I localized gingival recession defects were treated using the new CRF technique. Depth of gingival recession defect, width of gingival recession defect, the probing depth and widths of keratinized gingiva were recorded. The mean  $\pm$  SD was calculated for each of the clinical parameters.

**Results:** The baseline mean RD of  $1.94 \pm 0.57$  mm was reduced to  $0.15 \pm 0.26$  at 3rd month and  $0.21 \pm 0.39$  mm at 6th month. Mean root coverage was 92% at 3rd month and 89% at 6th month.

**Conclusion:** The new coronally repositioned flap technique is effective in the treatment of localized gingival recession defects.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

### P0374

#### "Envelope" Technique in dental implants – a clinical case

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**Aim:** To the success of treatment with implants is essential, during it placement and crown rehabilitation, pay particular attention to soft tissues that surround the rehabilitated area as they will be responsible for the positive aesthetic outcome; this

parameter deserves special attention to the anterior sector. There are several techniques of soft tissue management that promote an aesthetic result: soft tissue expansion/contouring, gingival grafts and advancement or rotational flaps, that can be done concurrently with implant placement or in a secondary surgical procedure. The "Envelope" Technique described by Raetzke for root cover in esthetic zone and later adapted for implants proved to be one of the best options for soft tissue management of a single gingival reception of dental implant in the aesthetic region. A purpose of a clinical case we pretend to describe the "Envelope" Technique applied to an implant rehabilitation in the aesthetic zone, with a 6 month follow-up.

**Material and Methods:** Female patient, thin gingival bio-type, rehabilitated 5 years ago with two implants in the region of 12/22, presents aesthetic commitment by soft tissue recession. To achieve the aesthetic outcome, a subepithelial connective tissue graft was done according to the "Envelope" Technique; new ceramic crowns were done too to promote the ideal adaptation between soft tissues/crown.

**Results:** Six months after the surgery its possible to see the good aesthetic result.

**Conclusion:** This technique improves the aesthetic outcome with reduction of trauma, avoids scars and allows to turn the shape of gingival biotype and may even make it thicker.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

### P0375

#### A comparative study of the results of coronally advanced flap with or without enamel matrix derivate in the coverage of Miller Class I and II carious roots

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Tabriz/Iran

**Aim:** The aim of this study was to compare the results of coronally advanced flap (CAF) with or without enamel matrix derivate (EMD) in the coverage of Miller Class carious roots

**Material and Methods:** Twenty patients with incisor or premolar presenting with a facial recession of  $\geq 4$  mm in contralateral quadrants of the same jaw were treated. The treatment consisted of a CAF procedure with (test group) or without (control group) EMD. Vertical recession depth (VRD), keratinized tissue width (KTW), clinical attachment level (CAL), and clinical probing depth (CPD) were measured preoperatively, 3 and 6 months post surgery. A paired t-test and independent t-test were used to compare differences for the measured characters within and between groups, respectively.

**Results:** Both treatment modalities resulted in a significant decrease in VRD and CAL gain at 6 month period. There was also a significant increase in KTW in test group. Test sites demonstrated significantly better root coverage, CAL gain and KTW increase after 6 months. Complete root coverage occurred more frequently in test group (55%) compared to control group (25%).

**Conclusion:** The CAF+EMD procedure seems to provide better results than the CAF alone in increasing the KTW, CAL gain and obtaining coverage in carious roots.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0376**

### Comparative 6-Month Clinical Study of a Subepithelial Connective Tissue Graft and Platelet Rich Fibrin for the Treatment of Multiple Gingival Recession

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Ankara/Turkey

**Aim:** The aim of this clinical trial was to compare the outcome of gingival recession therapy using the Subepithelial Connective Tissue Graft (SCTG) or Platelet Rich Fibrin (PRF).

**Material and Methods:** Hundred-six buccal gingival recession defects were treated in 20 systemically healthy patients. The teeth with defects were randomly assigned to the test group which was treated with PRF and to the control group which was treated with subepithelial connective tissue graft. The clinical parameters evaluated at baseline and after 6 months were plaque Index (PI) and gingival Index (GI), probing depth (PD), clinical attachment level (CAL), recession depth (RD), recession width (RW) and keratinized tissue (KT) width.

**Results:** Both treatment procedures were effective in treating recession defects resulting in similar improvements for percentage of root coverage (Mean root coverage was 95% for the PRF group and 96% for the connective tissue group). Six months after surgery, a statistically significant gain in CAL and increase in KT were assessed in both group ( $p < 0.05$ ). No statistically significant difference was found between the two groups for all these parameters ( $p > 0.05$ ).

**Conclusion:** The results obtained by PRF in the treatment of multiple adjacent recessions are clinically similar to the SCTG. More expanded clinical studies are needed to confirm the present findings.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0377**

### Treatment of Multiple Gingival Defects With Either Subepithelial Tissue Graft or Allodermal Matrix – A Case Report

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Istanbul/Turkey

**Aim:** Introduction: Labial movement of incisors has been considered as a risk factor for multiple gingival recessions. The aim of this case report was to compare different treatment modalities of gingival recessions caused by orthodontic tooth movement, together with restoring gingival esthetics biotype thickening and establishing function in these kind of defects.

**Material and Methods:** Case report: A healthy, 16 years old, non-smoking patient having Miller Class I buccal gingival recessions in anterior teeth was treated with subepithelial connective tissue graft (SCTG). Another healthy, 16 years old non-smoking patient having Miller Class II buccal gingival

recessions in anterior teeth was treated with alloderm graft. At baseline and 1, 3 months after surgical treatment, the following recordings were recorded: plaque index (PI), gingival index (GI), probing depth (PD), clinical attachment level (CAL), recession depth (RD), recession width (RW), biotype (B) and keratinized tissue width (KT).

**Results:** Discussion: Plaque and gingival index scores were decreased to health-associated levels in both patients. In subepithelial connective tissue graft used defects root surfaces were covered to 90%, also biotype was thickened; however allodermal matrix used defects resulted in with only tissue biotype thickening.

**Conclusion:** Subepithelial connective tissue graft and allodermal matrix can be used in multiple gingival defects for thickening biotype; however connective tissue may be more preferable for root coverage.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0378**

### The effectiveness of Semilunar Technique for the treatment of Gingival Recessions.

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**Aim:** The object of the present study was to compare the results of root coverage in localized bilateral gingival recession, Miller class I, with semilunar flap technique (Tarnow, 1086) using microsurgery (test side) and macro surgery (control side).

**Material and Methods:** Fourteen patients, who were being treated at the Veiga de Almeida University Health Center, between the ages of 25 and 41, non-smokers, without systemic diseases, without any history of periodontal disease and who weren't using any medicines that would compromise their periodontal health or healing, were included in this study. Upper canine and premolars with localized gingival recession up to 3mm were treated. The study followed the split mouth design and choosing the test side or control side was done randomly. All the surgical procedures were done by the same operator to assure optimum standardization levels. The patients were followed up on for six months, where the percentage of root coverage was compared between the test side and the control side of each patient, along with assessing the degree of esthetic satisfaction and post operative discomfort.

**Results:** The mean age was 31.36 ( $\pm 5.08$ ) and 57.14% were feminine. Six canine, 14 first-premolars and eight second premolars were treated. The average root coverage of the control side (macrosurgery) was 42.40% ( $\pm 16.98$ ). The total coverage was reached in 4 of the 28 procedures (14.28%), two on the test side and two on the control side.

**Conclusion:** This research showed that there was no benefit in using minimally invasive technique in gingival recessions with the semilunar incision.



Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

### P0379

#### The Non-influence of the periodontal morphotypes in recessions recovered of Miller's Class I and II.

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**Aim:** The aim of this present investigation was to evaluate the influence of the periodontal morphotype in the root coverage of Miller's Class I and Class II localized gingival recessions, using the technique of subepithelial connective tissue graft.

**Material and Methods:** Altogether, 19 periodontally healthy patients underwent surgery, 10 of them presented a thin periodontal morphotype and 9 presented thick periodontal morphotype, all of them aged between 18 and 40 years. There were treated Miller's class I and II gingival recessions (between 2 and 4 mm) in incisors, canines and premolars, with probing depth

**Results:** Six months after the surgery, 14 of the 19 patients achieved complete root coverage, 7 of them had thick morphotype and 7 of them had thin morphotype. The both groups obtained 90.93% of root coverage. Thin morphotype obtained 88.51% average of root coverage while the thick morphotype obtained 93.63%.

**Conclusion:** Periodontal morphotype has no influence in the success of root coverage procedure with subepithelial connective tissue graft.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

### P0380

#### Evaluation of Patients' Discomfort at the Palatal Donor Site Following Free Gingival Graft Procedures: A Randomized Controlled Clinical Trial

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**Aim:** The purpose of this study was to compare the effects on patients' discomfort of four different bodyguard methods for donor sites after free gingival graft surgery (FGG).

**Material and Methods:** This was a 2-week randomized, controlled clinical trial in single center, comparing the effects of four different cover methods on the discomfort (pain, chewing, speaking, appearance) of patients at the donor site after the FGG surgery. This study was performed on 4 groups consisting of 12 patients each. Group A, periodontal dressing (PD); group B, Essix retainer (ER), group C, modified essix retainer (MER); and group D, modified hawley retainer (MHR).

**Results:** The mean VAS scores for pain were higher in group A than in the groups with retainers at T1 ( $p>0.05$ ). While bleeding was significantly more common in group A than in the other groups at T1 and T2 ( $p<0.05$ ), the differences among groups B, C, and D were not significant ( $p>0.05$ ). The present study showed speaking and appearance VAS scores in the PD group was lower than in the groups with retainers ( $p<0.05$ ).

**Conclusion:** Patients' discomfort about the donor site after FGG surgery may be reduced with cover techniques. In particular, MER and MHR retainers showed reductions in pain and bleeding, thus increasing patients' comfort.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

### P0381

#### Esthetic Treatment of a Pathologically Migrated Central Incisor. Case report.

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**Aim:** Pathological migrations of the teeth are a frequent symptom of chronically periodontitis due to the loss of supporting bone and periodontal structures. Using regenerative methods, we try to recreate the periodontal structures around the tooth involved, followed by orthodontic treatment for an esthetic outcome

**Material and Methods:** The 36 years old male patient was diagnosed with advanced periodontitis #11, having a disto-palatal pocket of 10mm PD and gingival recession of 2mm. The tooth was both anterior and vertically migrated, developing an inesthetic diastema. The tip of the approximal septum wasn't involved. After initial treatment, debridement, scaling and root planing, the site was reevaluated four weeks later. Flap surgery was performed using biomaterials (BioOss, Emdogain) for regenerative reasons. We used special suture techniques to cover the recession. Rigid splinting of the anterior teeth followed the same day. Clorhexidine mouth wash and amoxicillin was prescribed. Sutures were removed after 21 days. After three months brackets were installed and slight forces were applied.

**Results:** Postop evolution was very good, the recession remained well covered. Xray images showed a good filling of the defect after several months. The probing depth (PD) decreased to 2mm all around the tooth proving the reattachment of the gum. After the orthodontic treatment of #11, the tooth took its original position, improving the esthetics.

**Conclusion:** Having a correct diagnostic and a proper treatment of such periodontal lesions as well as using regenerative biomaterials and esthetic surgical techniques, we can achieve predictable results each time we need.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

### P0382

#### Mathematical modelization of photographic image distortion in root coverage evaluation

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**Aim:** An image analysis system (ImageJ) has been used to evaluate the amount of root coverage after surgical procedure (Kerner et al 2007, 2008.). No custom-built frame or special equipment was used. It has been assumed that the accuracy of

the results may be jeopardized by the distortion of the images. We build a mathematical model to set the limits of the use of this method.

**Material and Methods:** An oral hygiene model presenting a recession defect on tooth 21 was used. Photographs were taken with a digital camera at 5° intervals between 0° to 35° by shifting the position of the model in mesial, distal, apical or occlusal positions. The images were analyzed with ImageJ. The crown edge height (CEH) the crown edge large (CEL), recession depth (RD), and the root surface area (RSA) were measured.

**Results:** The distortion of the image was evaluated using the following mathematical model:

$\alpha$  ( $\beta$ ) corresponds to horizontal (vertical) shift of the clinical views.

$RSA_{measured} = RSA_{initial} * \cos(\alpha) * \cos(\beta - 10)$

$RD_{measured} = RD_{initial} * \cos(\beta - 10)$

The mathematical model was highly correlated to imageJ measurements ( $p < 10^{-3}$ ). A graph set the limits of the distortion, saying that in our model a distortion  $> 10\%$  corresponds to a 16° angle.

**Conclusion:** This model allows determining the limits of the angulations of the clinical views to ensure a minimal distortion in the evaluation of root coverage.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0383**

**Periosteoplasty for covering recessions – Clinical results**

S. Virnik

Klagenfurt/Austria

**Aim:** In this case series a new technique for the surgical treatment of periodontal recessions is presented along with a report on the first clinical results. I

**Material and Methods:** A new technique of periodontal flap surgery was performed on 30 patients with severe periodontal recessions of the upper or lower front teeth. Sulcus bleeding, periodontal probing depths, attachment loss and the length of the attached gingiva were registered for the affected teeth preoperatively and at 3, 6 and 12 months postoperatively.

**Results:** Every clinical parameter was improved by surgery. No sulcus bleeding was observed at any time during the postoperative follow-up. A mean reattachment of 5.5 mm was noticed 12 months postoperatively at a mean probing depth of 0.3 mm. The mean height of the attached gingiva was 0 mm before surgery, 2.3 mm at 3 and 6 months postoperatively and 2.2 mm at 12 months.

**Conclusion:** The periostium eversion technique is suitable for the treatment of gingival recessions resulting in good gingival function and a clear improvement in aesthetics.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0384**

**ESTHETIC CONSIDERATIONS IN THE ANTERIOR REGION**

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**Aim:** Patient M.K., age 33, presented at Department of Periodontology with complaints of bleeding and swelling of gingiva, especially at maxillary anterior teeth. The problems began after metal ceramic crowns were placed on teeth 11 and 21. Patient is healthy and does not take any medication

**Material and Methods:** We performed initial periodontal therapy, instructed the patient in oral hygiene maintenance, and prescribed oral antiseptic. After seven days, inflammation was significantly reduced, except for the central maxillary incisors. We repeated initial periodontal therapy and recommended removal of old crowns, because biological width was obviously compromised. Temporary crowns were made and crowns were lengthened on teeth 11 and 21. After 3 months, single full ceramic crowns were placed

**Results:** This therapeutical approach was successfully used to treat gingivitis, establish compromised biological width and improve the esthetics in the anterior maxillary zone.

**Conclusion:** Combination of periodontal and prosthetic therapy resulted in removal of mechanical irritations, reduction of gingivitis, and harmonization of gingival line appearance in the anterior zone. In addition, gummy smile was significantly reduced and satisfactory esthetics was achieved

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0386**

**Mucogingival Surgery of upper incisor**

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Beijing/China

**Aim:** Introduction: Gingival recession is a common condition in the clinic. Mucogingival surgery is an effective method to solve such problem in esthetic area.

**Material and Methods:** Case report: A 28years old female wanted to have her right upper incisor re-restored with porcelain crown. She required the same height of both incisors. She refused the crown lengthening surgery of the left upper incisor and complained about gingival recession as the reason of the old crown. Clinical examination: The gingival margin (GM) of 21 was 3 mm lower than that of 11. AG width of 11 was 3 mm. PD of 13 to 23: 2 to 3 mm. BI: 0. No mobility. Surgery stage: Stage one: Subepithelial Connective Tissue Graft. The subepithelial connective tissue was taken from the palatal gingiva of 14 and 15 by making an envelope-shaped incision. A semi-thick flap was made in labial side of 11. Stage two: Semilunar flap Surgery. A semilunar incision was made 3 mm away from the GM of 11 and a semi-thick flap which was coronary repositioned later was made. Outcomes: Stage one: Thickened attached gingiva with 1 mm coverage. Stage two: 2 mm more mm cover of root surface. GM remains stable by 12 months follow-up.

**Results:** Discussion: Stage one provided the thickness and width of attached gingiva for stage two.

**Conclusion:** There are several kinds of mucogingival surgery of different keystones but the same goal. In some cases two or more kinds of surgeries should be used to gain the growth and stability of the new attached gingival.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0387**

### Hyperpigmentation Case on Smoker Patient Using Gingival Abrasion Technique

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*Jakarta/Indonesia*

**Aim:** Introduction. Gingiva Hyperpigmentation will not create medical problem clinically. However, some reports claim that 95% smokers have black lip and gingival due to the creation of melanoblasts that results in hyperpigmentation. This problem is aggravated in patients with a "gummy smile" or excessive gingival display while smiling and speaking. Gingival depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques.

**Material and Methods:** Case Report. A 21-years-old smoking male patient presented for cosmetic treatment from left second premolar to the right second premolar of maxillary and mandibular. His complaint were black gingival. The treatment concept is depigmentation using high speed diamond bur.

**Results:** Discussion. The present case report describes a simple and effective surgical depigmentation technique that does not require sophisticated instruments or apparatus yet yields esthetically acceptable results along with patient's satisfactions. The technique showed satisfactory result. One week after depigmentation, gingival is seen to be reddish in appearance. Three weeks later, gingival is shown in pink, and there is no repigmentation.

**Conclusion:** . Technique of gingival abrasion with high speed diamond bur could be an alternative for hyperpigmentation treatment to smokers at which the result is satisfactory with a simple tool and technique so that it could be implemented at general dentist.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0388**

### Acellular dermal graft (AlloDerm) with the tunnel technique in the treatment of multiple recession in lower incisors.

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Agustín-Panadero

*Gandia/Spain*

**Aim:** The tunnel technique by means of grafting AlloDerm

enjoys a high predictability in the treatment of Miller class I and II multiple recession. A 90% root coating is achieved, similar to the one obtained through the subepithelial connective tissue grafts. The success of this technique is due to the maintenance of the quality of vascularisation in the surgical site, thanks to the minimum tissue cleavage. It is a very sensitive procedure to the technique due to the limited workspace. However, the acellular skin graft of easy handling and uniform thickness facilitates the operation.

**Material and Methods:** CASE REPORT Three female patients between 30-50 years old with Miller class I multiple recessions in the lower anterior teeth have been treated. A partial-thickness sulcular incision is made, without papillary cleavage, with a distal vertical discharge. We proceed to graft AlloDerm by means of suture traction through a vertical incision. The graft is placed, stabilized and maximally covered with the flap through simple anchor around tooth suture.

**Results:** After one year, we have achieved an increase of the thickness of the connective tissue and increase around 80-100% the coverage of radicular defects.

**Conclusion:** Alloderm graft, by means of the tunnel technique, is a recommended option in the regeneration of the adjacent gingival defects connected by esthetic papillae. It allows us to treat wide areas in a unique operation with a better postoperative period and predictable results.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0389**

### Use of Mucoderm for treatment of multiple gingival recessions Miller Class I-II

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*Szeged/Hungary*

**Aim:** The use of a subepithelial connective tissue graft (SCTG) in conjunction with a modified coronally advanced tunnel (MCAT) is a widely performed periodontal procedure for root coverage. The aim of this study is to improve the main outcomes of MCAT technique used with a certain acellular dermal matrix xenograft (ADMX) for the surgical treatment of Miller Class I-II multiple gingival recessions.

**Material and Methods:** 3 patients were treated with buccal Miller Class I-II multiple gingival recessions followed for 3-6 months. In the first case the sites were treated with Mucoderm® (ADMX), in the other 2 cases the recessions were bilateral, one side treated with ADMX and the other side with SCTG. 7 parameters were recorded at baseline and at 3 and 6 months post-surgery: recession depth (RD), recession width (RW), keratinized gingiva width (KGW), height of papillae (PH), width of papillae (PW), distance of papilla and contact-point (PCD), probing pocket depth (PPD).

**Results:** The healing time was uneventful at the ADMX (test) sites. Short-term results (3 and 6 months) show that all parameters are similarly improved at the test sites and at the control sites.

**Conclusion:** These results suggested that the MCAT technique used with a certain ADMX could be successful for root coverage in case of Miller Class I-II multiple gingival recessions.

Mucoderm® offers a safe alternative to autologous connective tissue grafts in root coverage. The postoperative time interval was short, it has sense to continue with the study.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

### P0390

#### Gummy smile reduction using mucosal coronally repositioned flap

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Hamedan/Iran

**Aim:** Introduction Giving patients a beautiful smile has always been an important aspect of dentistry. A gummy smile or excessive gingival display may be a cause of embarrassment in patients. This condition has different causes including delayed eruption of teeth, Vertical maxillary excess and hypermobile muscles of the upper lip. There are different treatments of this condition usually involving orthodontic and orthognathic surgery for achieving a predictable result.

**Material and Methods:** Case Report The patient was a 28 year old female who had referred to our periodontal department seeking a less invasive treatment for her gummy smile. Her clinical crown dimensions were less than normal. According to cephalometric analysis a vertical maxillary excess was diagnosed. First, an esthetic crown lengthening surgery of her anterior maxillary teeth was done. Then a surgical procedure consisting of a tapering elliptical mucosal excision was performed from the first maxillary molar of one side to the other and coronally repositioned and sutured in place to reduce muscle activity and vestibular depth.

**Results:** Discussion

There were mild post operative discomfort and significant reduction of gingival display during smiling in the first two weeks. After a 12 month follow up period the patient was satisfied with her looks and the results were stable except for a mild relapse in the buccal frenum areas, indicating a need for a wider incision of this area and repositioning of the frenomes.

**Conclusion:** It seems that this procedure can be effective and be considered as a less invasive approach.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

### P0391

#### Treatment of a gingival recession defect combining Mucograft® with a laterally moved, coronally advanced flap: a case report

H. De Bruyn, H. De Vree  
Gent/Belgium

**Aim:** Introduction: For root coverage therapy, the coronally advanced flap (CAF) combined with a connective tissue graft (CTG) is considered the gold standard therapy. However, new

procedures are developed to overcome problems like a second surgical site, graft size and patient's morbidity.

**Material and Methods:** Case report: The case involved a 49-year-old female with Miller Class I recession of 4 mm on a lower central incisor and limited keratinized tissue apical to the defect. Mucograft® (Geistlich Pharma, Wolhusen, Switzerland), a pure porcine collagen matrix, was used in combination with a laterally moved, coronally advanced flap to treat the gingival recession. The collagen matrix was completely covered by the flap. Gain in gingival thickness and keratinized tissue could be observed 3 months after treatment and a creeping attachment was seen between month 3 and 6, resulting in complete root coverage after 6 months. A nice blending of color and thickness of the surgically treated area with respect to adjacent soft tissues was seen. Tooth sensitivity had disappeared and the result remained stable during the follow-up period. The surgical procedure and baseline, 3, 6, 12 and 24-month clinical follow-up were documented.

**Results:** Discussion: CTG is frequently associated with swelling and pain at the donor site. A collagen matrix combined with laterally moved, coronally advanced flap was a viable alternative without the morbidity of soft tissue graft harvest. The surgical technique requires a certain amount of keratinized tissue at the tooth adjacent to the recession defect to prevent gingival recession at the donor tooth.

**Conclusion:** The described technique was successful in covering the recession defect.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

### P0392

#### Ligneous Periodontitis: A Case Report

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Ankara/Turkey

**Aim:** Introduction: Ligneous periodontitis (LP) is a rare, poorly defined entity that is characterized by gingival enlargement and periodontal tissue destruction. LP; is the part of a systemic disease due to plasminogen deficiency and fibrin deposition. This study reports a case with LP and its three years follow-up.

**Material and Methods:** Case Report: A 31-year-old Turkish woman was referred to our clinic for gingival bleeding and hypersensitivity problems. Intra-oral examination revealed painless, massive, fragile, nodular, gingival enlargements on both the maxilla and the mandible. Radiographic examination revealed severe bone-loss at the jawbones. The patient's medical history revealed ligneous conjunctivitis at the age of 8. There was no history of prolonged use of medication. A gingival biopsy was performed after phase 1 periodontal treatment. The histopathologic examination revealed the diagnosis as ligneous periodontitis.

**Results:** Discussion: Although its etiology is unclear, ligneous periodontitis may develop as a secondary response to autoimmune reactions, trauma, hypersensitivity reactions, genetic disorders, and bacterial or viral infections. The gingival lesions associated with this entity are progressive and usually end with tooth loss. No reported surgical or periodontal treatments have been proven to be successful. In some cases, the gingival lesions become quiescent or disappear after tooth loss. Most of the reported oral lesions were seen together with ligneous conjunctivitis lesions.



**Conclusion:** Extensive membranous, gingival enlargements like in LP that do not respond to periodontal treatment modalities may be a part of a systemic syndrome due to plasminogen deficiency. In such mucosal disorders, gingival biopsy is essential for early diagnosis before the teeth are lost.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0393

### Oral fibromyxoma: a rare muco-gingival localisation of a lesion mimicking fibrous hyperplasia

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**Aim:** Oral fibromas are sessile smooth surface nodules varying in size. Most of them are considered to be fibrous hyperplasias which result from gingival irritation (Pindborg 1995). Nevertheless, biopsy can sometimes reveal variants of fibroma such as the fibromyxoma. The clinical observations, treatment and results of histological typing of a lesion encountered in the palatal region are reported

**Material and Methods:** A 21 year old female patient presented with a local and painless fibrous hyperplasia localised at the palatal gingiva between teeth 26 and 27 without evidence of any irritating factor. Probing showed no pockets in this area. No signs of bone loss or root resorption were visible on the intra oral radiography. Clinically, the lesion was 3mm thick, 7mm long, 5mm wide. It was removed and sent for analysis.

**Results:** Biopsy showed a myxoid fibroma with no sign of malign degeneration. It was bordered by a malpighian epithelium and the central area was formed by a myxoid oedema with some young fibroblasts. Lymphocytes were present in the peripheral area and at the surface of the epithelium. Some polymorphonuclear cells were found at the borders of the tumor implantation. The patient was seen one year after removal of the lesion and then again one year later. No recurrence was seen. A control x-ray did not show any bone resorption.

**Conclusion:** Oral fibromas observed in the absence of an irritating factor need further investigation. Biopsy can reveal lesions which rarely occur in the oral region, in this case a fibromyxoma.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0394

### Correction of damaged functional relationships caused by periodontal disease

N. Rincic, J. Leusic Temmer  
Zagreb/Croatia

**Aim:** Patient aged 58 years with medium advanced chronic periodontitis was sent to our clinic. The patient complained of difficulty chewing due to distinct grade III mobility of tooth 21.

**Material and Methods:** Tooth 21 showed vertical bone

resorption and periodontal pockets of 6 mm depth on the palatal and approximal sides of the tooth, and gingival tissue recession of 3 mm on the vestibular aspect. A lack of support zone in lateral regions of the jaw caused disorder of intermaxillary relationships in terms of a revers overlap of frontal teeth, except tooth 21 which was extruded from the arch due to abnormal migration caused by the loss of supporting structures. Following endodontic treatment and initial periodontal therapy, tooth 21 was restored in a proper position within the arch using orthodontic elastics combined with a temporary lifting bite. In two days, tooth 21 was brought into the desired position and immobilization with Ribbond tape was made, which also serves as a permanent retainer. Following splinting of the tooth, initial periodontal therapy II was made.

**Results:** Recall appointments show a decrease in periodontal probing depth of about 3 mm. Recession of gingival tissue around the tooth 21 remained unchanged compared to the base-line and there were no signs of inflammation. The patient was extremely satisfied with the functional and aesthetic outcome of the conducted therapy.

**Conclusion:** This case report shows that interdisciplinary approach in treating periodontal disease is necessary in some cases in order to achieve functional and aesthetic harmony on general patient satisfaction.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0395

### Periodontal-Restorative aesthetic and functional rehabilitation of a patient with a severe class 2 division 1 incisal relationship and deep traumatic overbite.

A.J. Barber, P.H.R. Wilson  
Bristol/United Kingdom

**Aim:** Introduction The management of a patient presenting with poor dental appearance and tender gingivae behind his upper anterior teeth is described. Uncontrolled generalised chronic periodontitis, a skeletal class-2 relationship, a severe class-2 division 1 incisor relationship and an associated deep traumatic overbite complicated the case. The periodontal and restorative clinical procedures involved, evidence-base for the treatment strategy and improvements in quality-of-life are discussed.

**Material and Methods:** Case Report Diagnoses included moderate to severe chronic generalised periodontitis, severe class-2 division 1 malocclusion with associated type 1 (Akerly 1977) deep traumatic overbite, acquired tooth loss and failing upper anterior conventional bridgework. Periodontal management; cause-related therapy then supportive periodontal therapy were instigated. The upper anterior teeth/bridgework were dismantled and provisionalised with veneers, crowns and bridgework. The inverse smile curve was corrected by modifying the provisional restorations. Metal-ceramic crowns/bridgework with palatal guide-planes and adhesive ceramic restorations restored the upper anterior teeth. An upper precision removable prosthesis provided at an increased occlusal vertical dimension, incorporating an anterior bite platform protected the palatal gingivae.

**Results:** Discussion Deep traumatic overbites may be exacerbated by drifting of teeth with periodontal disease. Orthognathic surgery and fixed implant prosthodontics are another, more

invasive, method of treating such cases. A removable prosthesis which provided an anterior bite platform, allowed for an increase in the occlusal vertical dimension without involving costly restoration of the posterior tooth units.

**Conclusion:** The case demonstrates the multidisciplinary periodontal-restorative management of a case of deep traumatic overbite and inverse smile curve using conventional and adhesive restorations and precision removable prostheses.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

### P0396

#### patient's self performed therapy for gingival recessions of traumatic origin

S. Bresciano, C. Camorali

Torino/Italy

**Aim:** Gingival clefts and recessions of traumatic etiology caused by aggressive oral hygiene or mouth piercing, can successfully be treated by removing the cause. Treatment objectives are to arrest the recession process and gain periodontal attachment. In a time frame of 6-12 months it is possible to stabilize the receded gingival margin and obtain recovery of the cleft areas with the gain of attached gingiva. Treatment is performed by the patient with the elimination of the traumatic event. Different clinical cases will be shown with pre and post data and images collected at 6-12 months and on a long distance recall to reevaluate the stability of the periodontium.

**Material and Methods:** The health professional must know the predisposing factors to gingival recessions, recognize early signs of gingival trauma and identify the causes of the recession where present. Traumatic recessions have a specific clinical aspect with pointed clefts, traumatic gingival abrasions and no plaque deposits. In presence of oral piercing the recession corresponds to the trail of the pierce during mouth movements. When the patient is asked to perform daily oral hygiene procedures in the dental setting the results usually are aggressive tooth-brushing (vertical or horizontal techniques) or traumatic flossing (floss pushed too much subgingivally or not appropriately wrapped around the proximal surface), or vigorous movements or a combination of the afore mentioned. Behavioral factors associated with daily traumatic oral hygiene such as psychological and/or stressful situations, dislike of own's teeth color, fears of dental procedures, fear to be reproached by the dentist/hygienist or to loose teeth, must be detected. In order to obtain collaboration it is necessary to make patients self conscious of the problem. Among the different approaches we found of great impact the identification by the patient of problem areas with a mirror or an intraoral camera and a computer presentation of clinical cases pre and post successful treatment. Each patient must be directed toward self-identification of traumatic cause and be guided to perform proper oral health behaviours.

**Results:** Different clinical cases of gingival clefts and recessions of traumatic origin have been successfully treated by removing the traumatic behaviour performed by the patient. The time necessary to obtain results is of 6-12 months, and can be maintained stable in a long time period.

**Conclusion:** Gingival recessions of traumatic etiology related to patient behaviour must be recognized and treated initially with the removal of the traumatic event. The most common cause is aggressive oral hygiene or oral piercing. With this initial treatment it is possible to obtain good clinical recovery of the gingival cleft in a short time

frame and prevent recurrency. Changing daily oral hygiene habits or removing the mouth pierce requires a great deal of motivation. The dental team must support the patient and apply different clinical tips for prevention, early interception and non-surgical treatment.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

### P0397

#### Soft tissue management after tooth extraction in the esthetic zone – a case report

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Rijeka/Croatia

**Aim:** Tooth extraction results in alveolar ridge resorption that is more pronounced on vestibular bone wall. The reduction of hard and soft tissues could cause functional and esthetics problems in future restorative procedures.

#### Material and Methods: CASE REPORT

Patient diagnosed with chronic periodontitis wanted to improve esthetic appearance of his incisors – gingival recession, protrusion and tooth mobility of the tooth 21. After initial periodontal therapy, the plan was to extract the tooth 21 and to preserve the alveolar socket. Bioabsorbable barrier collagen membrane was used to replace resorbed vestibular bone wall and to cover the entrance of the alveolus, which was filled with bone substitute material, while free gingival transplant from the palate was sutured to seal the entrance of the alveolus. After four months, ridge defect was obvious (Class I according to Siebert) and we decided to perform soft tissue augmentation (pouch graft procedure with free connective tissue graft harvested from the palate using the “trap-door” technique). Restorative procedure followed after three weeks including temporary bridge with ovate pontic, and root canal therapy on the tooth 22. After three months, impressions for definitive bridge were taken, and zirconium oxide framework was milled from IPS e.max ZirCAD block using Sirona InLab CAD CAM system. Definitive bridge was made from IPS e.max ceramics using layering technique and cemented with composite cement.

**Results:** no results

**Conclusion:** In order to achieve optimal results in the esthetic zone, augmentation, adaptation and reshaping of the soft tissue should be performed before restorative procedure.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

### P0398

#### Correction of pathologic tooth migration in advanced aggressive periodontitis patient

T. Domic, A. Aurer, D. Vrazic

Zagreb/Croatia

**Aim:** Patient D.T., age 34, presented at Department of Periodontology with complaints of strong pain with multiple periodontal abscesses and significant tooth migration. Familiar history was positive.

**Material and Methods:** Advanced aggressive periodontitis was diagnosed and initial periodontal therapy performed with addition of systemic antibiotics. Reevaluation after two months showed significant improvement. Next pathologic tooth migration, significant mobility and loss of interdental contacts in upper front were addressed. Using elastic bands teeth were realigned in 3 weeks and composite fiber-reinforced splint done. Closure of interdental spaces and apical reposition of contact points resulted in reappearance of papillae.

**Results:** Aim was to control the infection and stabilize upper front teeth. There were no active residual pockets after debridement in the frontal area so orthodontic movement was undertaken. Further surgical therapy is planned for lateral teeth.

**Conclusion:** Minor orthodontic movement using elastic bands and composite fiber-reinforced splint resulted in realignment and stabilization of the upper front. Esthetic correction resulted in significant motivation for the patient as his major complaint was impairment of chewing function and significant unease in social contacts.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0399**

### Ozone therapy as an adjunctive treatment option in immunologically compromised patient with aggressive periodontitis

I. Jurcic, T. Kuna, I. Puhar, D. Vrazic, M.I. Kardum  
Zagreb/Croatia

**Aim:** Female patient, aged 50, complained about inflammation and occasional gingival bleeding which was ongoing for 18 months. She was referred to our Department by her dentist.

**Material and Methods:** After taking patient history, measuring clinical periodontal indices and analysis of occlusion, the patient was diagnosed with advanced aggressive periodontitis. Before performing nonsurgical periodontal therapy we did all the fillings and endodontic treatments that were necessary. Full mouth disinfection protocol was done in two days with quadrant-wise deep scaling and root planning followed by additional ozone therapy. After 3 months at reevaluation all sites showed significant improvement with the highest reduction of pocket depth from 12 mm to 6 mm in distal approximal regions.

**Results:** This patient had breast cancer treated with radiation therapy just before she was referred to our Department. Standard antibiotic prophylaxis prior to our procedure was not performed as she started receiving antibiotics (amoxicillin + metronidazole) one day before full mouth disinfection (standard procedure for aggressive periodontitis). In order to avoid another deep scaling and root planning of residual active pockets and administration of antibiotics that was likely to happen within the first 6 months of radiation therapy (this would further compromise the patient), she was treated additionally with ozone therapy after full mouth disinfection.

**Conclusion:** Ozone therapy as an adjunctive treatment option in aggressive periodontitis showed to be a very effective in this complex situation. Therapy resulted in resolution of inflammation and significant pocket depth reduction, which also eliminated the need for possible surgical treatment options in already considerably immunologically compromised patient.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0400**

### A comparison of pressure generated by cord and cordless displacement techniques

V. Bennani, J. Aarts, L.H. He  
Dunedin/New Zealand

**Aim:** This investigation describes how pressure is generated by a cordless retraction paste material (Expasyl, Pierre-Roland) with respect to different loading methods. The pressure generated by cordless systems is defined and compared for the first time.

**Material and Methods:** Two chambers with the dimension of 5x5x2mm were made from type IV stone and silicone material to simulate a rigid and elastic environment respectively. A pressure gage was embedded into the wall of the chamber and the final pressure from Expasyl was recorded by Chart 5 software and Power Lab system. Different material loading methods were compared using One-way ANOVA with no statistical difference ( $P=0.63$ ) found. A retraction cord was used as a control for the study.

**Results:** The final retraction mean pressure generated by Expasyl is 146.6kPa. No statistical difference was found between the different chambers. Manipulating Expasyl after placement resulted in a significant pressure reduction (87% in stone chamber and 39% in silicone chamber).

**Conclusion:** The packing pressure generated by Expasyl is 10 times lower than the cord system. Pressure is generated during injecting of the Expasyl and subsequent packing will release pressure.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0401**

### The single anterior tooth dilemma: to treat or extract in the esthetic zone!

R.S. Schoor, A. Einhorn, V. Nanda  
New York/United States of America

**Aim:** This clinical case presentation describes the dilemma when called upon to treat an anterior incisor. The algorithm we followed in developing the proper diagnosis was successful and to be shared.

**Material and Methods:** An incisor fracture presented 2 mm below the CEJ and above the marginal bone. A palatal surgical approach provided a change in diagnosis from hopeless to treatable reducing the extraction, site development, implant integration and time for restoration yet preserving the existing facial esthetics. Limiting the access flap to the palate, the surgery preserved the thin gingival biotype with no esthetic compromises. At 4 weeks, the patient was referred for endodontic treatment after provisional crown placement.

**Results:** Retaining the incisor preserved the thin biotype, reduced post-operative complications, and achieved outstanding patient appreciation.

**Conclusion:** Implant therapy over traditional dentistry assumes the most predictable treatment option, however, esthetic outcomes are paramount in the esthetic zone. We present a novel surgery accessing the palatal surface while maintaining, intact, the gingival tissues.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0402**

### Comparative study of the reliability of oral rehabilitation methods by dental connective prosthesis implant

V. Danila, C. Danila, I. Rudnic

*Iasi/Romania*

**Aim:** We aimed at achieving a comparative study of methods of oral rehabilitation reliability of unidentare edentulous with the help of a support dental support prosthesis vs. unidentar implant prosthesis and the restoration of class I and II Kennedy edentoulism with a mixed support FPD vs a removable partial denture.

**Material and Methods:** We have studied a group composed of 56 patients (25 men and 31 women), aged between 23 and 68 years, different classes of partially edentulous. It must be made clear that in the study, were terminal edentoulism was present, we used an adequate number of implants to a minimise the number of intermediaries included in the body of the bridge.

**Results:** The survival rate for dental implants that replaced teeth lost due to parodontal disease was 90.5%, while the survival rate of implants that replaced teeth lost for other reasons (caries, fracture, trauma) was 96.5%.

**Conclusion:** Within this study we can say that when conditions allow it a fixed prosthesis on mixed dental-implant support is indicated, since this type of prosthesis produces far fewer negative changes in the prosthetic field than the partially removable prosthesis.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0403**

### Aggressive Periodontitis in South Western Nigeria: Case Series

E.B. Dosumu

*02/Nigeria*

**Aim:** Reported prevalence of periodontal disease in Nigeria is 33.4% to 85.8% where the knowledge/attitude of Nigerians to this disease is poor and the total number of periodontologists available to attend to these cases is very low. The diagnosis of aggressive periodontitis in this environment is either delayed because of the knowledge and attitude of these patients about this disease, or missed because of the overwhelming periodontal care needs.

**Material and Methods:** We present the history, clinical

and radiological findings of three (3) cases of early and late presentation of aggressive periodontitis patients aged 15-27 years, in which severe periodontal tissue destruction is a common feature in both with eventual tooth/teeth loss in late presenters and no tooth loss in the early presenters. At presentation, all had a full periodontal examination and screening completed and treated using standard periodontal debridement, scaling and root planning and systemic antibiotics therapy. Hopelessly affected tooth/teeth were extracted and the lost tooth/teeth replaced with acrylic dentures. The patients/ patient's parent provided informed consents and ethical approval was obtained from the institution ethical committee, the study was conducted in accordance with the Helsinki declaration of 1975 as revised in 2000.

**Results:** This case series presentation highlights the severity of periodontal tissue destruction in early and late presentation of aggressive periodontitis in this environment.

**Conclusion:** There is a need for aggressive dental education/enlightenment of the peoples in this environment especially on periodontal disease and increase in the number of periodontists to meet up with this challenge.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0404**

### Conservative Interdisciplinary Treatment in a Case of Aggressive Advanced Periodontitis: 8-years-follow-up.

G. Machuca Portillo, L. Castellanos Cosano, A. Mendoza

Mendoza, A. Iglesias Linares, L. Soto Pineda, E. Solano Reina

*Sevilla/Spain*

**Aim:** The conservation of teeth depends on the health of periodontal tissues. Periodontitis remains one of the most prevalent chronic human diseases and a major cause of tooth loss. If periodontal problems combines malocclusion problems, the situation is much more complicated, since the options for implementing such treatment become much more restrictive.

**Material and Methods:** The patient was a 28-year-old woman with a main complaint of vestibular extrusion of the maxillary incisors due to advanced aggressive periodontitis. The patient had been diagnosed of depressive psychotic disorder in treatment with Meleril and Prozac for 10 years and was allergic to latex. Clinical first exploration showed the presence of a major gingival inflammatory process which after closer study was diagnosed as advanced aggressive periodontitis. There was 81% bacterial plaque and 77% bleeding on probing. Radiographs performed after clinical exploration, showed generalized loss of horizontal and vertical periodontal support. The patient was of mesofacial appearance with a skeletal Class II base jaw relationship, with mandibular retrusion, a convex skeletal profile, a dolichofacial pattern and protruded maxillary and mandibular incisors and angle Class II molar and canine relationship. There was an overjet of 13 mm and an overbite of 2/3. The patient wanted to preserve their teeth and was refused to the idea of implant treatment.

**Results:** This case demonstrates that combining periodontal therapy, orthodontic treatment and prosthodontic greatly improved function and esthetics.

**Conclusion:** An interdisciplinary approach is frequently the best choice to obtain a predictable outcome for an adult patient with complex clinical problems.



Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0405**

### Clinical effect of three glass ionomer cement restorative materials used in Class V cavities on the gingival tissue

A. Horvath, Z. Papp, C. Dobo-Nagy, I. Gera  
Budapest/Hungary

**Aim:** The restoration of cervical abrasions, erosions or class V. carious lesions is still challenging because of their unpredictable adhesion and possible negative effects on the marginal plaque accumulation and gingival health. Three Glass Ionomer cements (Fuji IX GP, GC Fuji IX GP EXTRA and GC G-Coat PLUS (Equia®) put paragingivally or partially subgingivally into class V cavities were studied. It was also investigated if GC G-Coat Plus cement with a light curing varnish has any additional effect on the gingival tissue.

**Material and Methods:** A total number of 30 non-smokers with healthy gingiva having cervical abrasion/erosion defects were enrolled in this study. The cervical abrasion/erosion defects were restored by using one of the three glass ionomer cements. The parameters of the gingival recession and cervical defects as well as plaque scores (PII), bleeding on probing (BOP), crevicular fluid flow (CFF) were recorded at baseline and after 3, 26 and 52 weeks.

**Results:** The dimensions of gingival recession did not change throughout the whole study. The plaque scores showed a slight but also not significant increase by the end of the study. The PPD, BOP and CFF did not change significantly throughout the one year observation period. The light curing varnish (Equia®) slightly improved the PII in the cervical region compared to the others.

**Conclusion:** Over the observation period, the glass ionomer cements did not significantly affect the gingival health but the GIC coated with the new varnish resulted in less plaque accumulation and somewhat better gingival health.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0406**

### Orthodontic treatment for periodontally compromised patient; case report.

F. Ismail, B. Mocanu, C. Strosser  
Bucharest/Romania

**Aim:** Introduction: Periodontal breakdown is one of the major causes of pathologic tooth migration (PTM). The incidence of PTM is reported to be up to 50% of periodontitis patient. PTM of the anterior maxillary or mandibular teeth is also one of the main reasons why periodontal patients are seeking perio and ortho treatment.

**Material and Methods:** Case Report: This is a case report of a 43 years old female patient who came to our clinic complaining of teeth drifting. The patient was diagnosed with generalized aggressive periodontitis, class I malocclusion, crowded and

malposed maxillary teeth and pathologic tooth migration; grade II pathological mobility of all anterior mandibular teeth with distal drifting of central, lateral incisors and both canines and secondary diastema of 6 mm width restored with a splinting device with prosthetic function. The appearance was of 5 lower incisors and the patient was unhappy with this solution. After completion of periodontal therapy, orthodontic appliances were placed in order to realign and to move back the drifted anterior teeth.

**Results:** Discussion: Orthodontic treatment was the only reasonable choice to fulfill the esthetic and functional requirements of this particular case. With good plaque and force control the prognosis of affected teeth can be improved.

**Conclusion:** Orthodontic therapy can provide some benefits to the adult periodontal patients. The following factors should be considered: aligning crowded or malposed anterior teeth permitting a better access for cleaning; correcting open gingival embrasures in order to regain lost papilla; orthodontic repositioning of drifted distal teeth in order to create enough space for implant placement.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0408**

### Actual methods of oral rehabilitation by using removable dentures in edentulous allergic patients

I. Gradinaru  
Iasi/Romania

**Aim:** The aim of this study was to present modern practical possibilities of oral rehabilitation by using removable dentures in edentulous allergic patients.

**Material and Methods:** The study included 4 edentulous patients, aged between 65-76 years. Before presentation in the dental office, patients had been treated by removable prosthesis based on polymethyl methacrylate. They presented allergic reactions to the classic PMMA. After methodical clinical and complementary examinations, the patients received a new prosthetic treatment made by thermoplastic materials. After specific clinical and technological phases, 7 removable prosthetic appliances were made of Polyan (from Polyapress).

**Results:** Polyan is a modern material used in removable appliances, specially designed for patients with allergies. In this thermoplastic material, used by injection technique, some allergenic constituents are not contained (eg. benzole peroxide, ethylene glycol dimethacrylate, triethylene glycol dimethacrylate, bisphenol-A-dimethacrylate, butyl methacrylate, dimethyl-p-toluidine, urethane dimethacrylate, hydroxy methoxy-benzophenone, colophonium, hydroquinone, iron chloride, BIS-MA, p-tolyl diethanolamine in alcohol, BIS-GMA, dimethyl amino ethyl methacrylate, camphor quinine, cadmium chloride, cobalt chloride). Polyan gives optimal tissue compatibility, high precision of fit.

**Conclusion:** Thermoplastic materials by injection technique are the solution of choice in prosthetic therapy of edentulous allergic patients.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0409**

### Twelve year follow-up of severe aggressive periodontitis in an adolescent patient

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*Zagreb/Croatia*

**Aim:** A 19-year-old female student was referred to periodontology department by her primary dentist assigned for students. This was her first visit to a periodontology specialist. She complained about occasional bleeding of gingiva, recession and some migration of the upper frontal teeth, as well as significant molar movement in the upper and lower jaw.

**Material and Methods:** An extensive periodontal examination with clinical indices and family history was taken. Although there were no signs of inflammation present, we found average recession of 4 mm and pocket depths from 7 to 10 mm around upper and lower molars and incisors. Endodontic treatment on 36 and 46 was done and all inadequate fillings were replaced. We performed non-surgical periodontal therapy with addition of systemic antibiotics (amoxicillin + metronidazole). After reevaluation we decided to perform additional surgical treatments of active residual pockets. Recall was scheduled every two months during the first year; afterwards, when the disease was under control it was every 4 months during the next period of 11 years. Upper and lower incisors were esthetically reshaped with composite material and a fiber-reinforced splint was placed.

**Results:** During the 12 years of follow-up of this severe aggressive periodontitis patient, we managed to preserve all teeth. Since the patient didn't lose any teeth and had acceptable esthetics, the treatment was considered successful.

**Conclusion:** Severe aggressive periodontitis can have a good long-term prognosis, but only with proper maintenance therapy.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0410**

### Salivary and Serum Levels of Sialic Acid in Subjects with Gingivitis, Chronic Periodontitis or Aggressive Periodontitis

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*<sup>1</sup>Istanbul/Turkey, <sup>2</sup>Istanbul/Turkey*

**Aim:** Sialic acid (SA), a neuraminic acid derivative, has been proposed as an inflammatory response marker in several systemic disorders, however, little is known about its role in periodontal diseases. The aims of this study were to evaluate salivary and serum levels of SA in patients with gingivitis, chronic periodontitis, aggressive periodontitis and healthy control subjects, and also to investigate any possible association between SA levels and periodontal clinical indices.

**Material and Methods:** Unstimulated whole saliva, stimulated parotid saliva and venous blood samples were collected from 10 gingivitis, 10 chronic periodontitis, 10 aggressive periodontitis and 10 periodontally healthy subjects followed by measurements of clinical variables including plaque index, gingival index, probing depth, bleeding on probing, clinical attachment level. SA levels were determined by thiobarbituric acid method.

**Results:** SA was detectable in total saliva, parotid saliva and serum in all groups of subjects and the detected levels revealed statistically significant differences between the groups ( $p < 0.001$ ). While the lowest SA level was detected in healthy individuals, aggressive periodontitis patients presented the highest SA level in all places of measurements. In addition, significant positive correlations were found between SA levels and all clinical parameters measured ( $p < 0.001$ ).

**Conclusion:** Within the limits of this study, SA was shown to have the potential to be used in monitoring inflammatory changes in periodontal tissues.

Topic: Basic Research: Biomaterials and Surfaces

**P0411**

### Biomimetic treatment on dental implants for immediate loading applications.

M. Muñoz Carcavilla

*Seville/Spain*

**Aim:** The aim of this work was to assess the short-term bone regenerative potential of implants blasted with Al<sub>2</sub>O<sub>3</sub> particles of 450-600 m and with thermo-chemical treatment in order to achieve apatite coating on the roughness of the dental implants.

**Material and Methods:** 120 implants were placed into the bone of 12 minipigs and compare them to micro-rough grit-blasted, micro-rough acid-etched, and smooth as-machined titanium implants. The screw-shaped dental implants were 3.8-mm in diameter and 12.0-mm in length with 1.0-mm pitch and 1.5-mm long coll. These were prepared with four different surface treatments and divided into four groups with 30 implants per Group. The percent of bone-to-implant contact was determined after 3 days, 1, 2, 3 and 10 weeks of implantation with histometric tests. The surface topography and wettability of the implant specimens was analysed.

**Results:** The results showed that the combination of the blasted and bioactive treatment accelerated bone tissue regeneration at short periods of implantation in comparison with all other implants tested. This was mostly attributed to the ability of these implants to form in vivo a layer of apatitic mineral that coated the implant and could rapidly stimulate a) bone nucleation directly on the implant surface; and b) bone growing from the implant surface.

**Conclusion:** The surface quality resulting from this treatment on cpTi provided dental implants with a unique combination of rapid bone regeneration and can be a good candidate for immediate loading clinical scenarios.

Topic: Basic Research: Biomaterials and Surfaces

## P0412

### Growth and differentiation of human osteoblastic cells from bone samples collected by two different techniques.

F.J. Manzano-Moreno, J.B. Rodriguez-Martinez, J. Ramos Torrecillas, E. De Luna-Bertos, O. García-Martínez, C. Reyes-Botella

Granada/Spain

**Aim:** Evaluate the presence of viable osteoblasts in different bone tissue samples and study their capacity for growth and differentiation

**Material and Methods:** Tissue samples were obtained from 10 healthy volunteers in the course of mandibular surgery. They were individually processed and cultured in the laboratory.

The proliferative capacity was measured by MTT assay and the differentiation was studied by culturing osteoblasts in osteogenic medium and subsequent staining of the nodules formed by alizarin red.

**Results:** Cell lines established from biological drilling samples showed a proliferation capacity significantly higher. The number of mineralized nodules was similar in the different lines of osteoblasts established.

**Conclusion:** The particulate bone obtained from low-speed drilling would have a better performance when is used as autograft.

Topic: Basic Research: Biomaterials and Surfaces

## P0413

### Sterilization effect and biomaterial compatibility of H<sub>2</sub>O plasma

K. Tamazawa, Y. Tamazawa

Sendai/Japan

**Aim:** The aim of this study was to generate stable H<sub>2</sub>O plasma and to evaluate its efficacy of sterilization and biomaterial compatibility.

**Material and Methods:** Sterilization effect was evaluated using BI (Biological indicator, SGM Disc, Merck), contains 106 bacterial spores *G. stearothermophilus* 7953 on a stainless steel disc packaged. Plasma processing (13.56 MHz, PACK-3®, YAC) was conducted under various gas pressures (2-100 Pa) and gas flow (50-100 ml/min). The output (150 W), chamber temperature (60°C), and discharge time (600 sec) were fixed. BIs were incubated in trypticase soy agar (BBL) at 58°C for 72 hrs.

Compatibility test was conducted to examine residual toxic substance inside the sterilized material. Three each disc (SUS316, Ø10mm, pore size:100µm) by three kinds of methods (H<sub>2</sub>O plasma, O<sub>2</sub> plasma, autoclave) was put into each well and 2.5×10<sup>4</sup> L929 osteoblasts were inoculated into each well, and cells were counted after 72 hr incubation.

**Results:** 1) Stable generation of H<sub>2</sub>O plasma was possible

without condensation in the gas lines by application of ultra low-volume mass flow controller (0.02 g/min). 2) H<sub>2</sub>O plasma showed high sterilization effect of more than 104 spores at 60°C in 10 min, however showed lower effect than O<sub>2</sub> plasma. 3) Cell compatibility did not have a significant difference among three sterilization processing (One-way ANOVA).

**Conclusion:** By further research, H<sub>2</sub>O plasma could be expected promising low temperature sterilization method because of high effect of OH and OH<sub>2</sub> radicals, and has also an advantage which does not require gas cylinder. This study was supported by a JSPS grant (No. 22390356).

Topic: Basic Research: Biomaterials and Surfaces

## P0414

### A Model Experiment of Thin HA-coated Implant under Functional Loading

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<sup>1</sup>Ibaraki/Japan, <sup>2</sup>Tochigi/Japan, <sup>3</sup>Saitama/Japan, <sup>4</sup>Tokyo/Japan

**Aim:** The aim of this study is to investigate stability and validity of 1~2µm thin thickness Hydroxyapatite (HA) coated implant which was made by Sputtering method. Cytotoxicity, sensitization, irritation, carcinogenicity, and trial implantation are generally used for implant safety evaluation. In this study, we tried functional loading test by using dogs.

**Material and Methods:** Two beagle dogs were used. Before and during experiment, we checked blood component every week. All mandibular premolars were removed. After 4 months of healing, HA coated implants were placed each animal bilateral mandibular. 45 days after implantation, 8 implants were functionally loaded. During loading term, we observed intra-oral photo, gingival index (GI), gingival crevicular fluid (GCF), probing depth (PD), implant mobility (M) and X-ray every week. The animals were sacrificed at 6 weeks. After dissection, samples were subjected to X-ray and subsequently to decalcified histological processing.

**Results:** [Hematological examination]: No notable laboratory test values could be detected through the experiment. [X-ray]: We observed bone resorption around 2 implants. So we excluded them from this exam. Others were seen as firmly osseointegration. [Histological results]: New bone formation was noticed in the cortical bone area. Although connective tissue containing was slightly found, it gave no influences to durability of functional loading. [Oral examination]: GI, GCF, PD, M were good condition through all loading term.

**Conclusion:** Within the limitation of this study, our results indicate that long-term systemic and biological safety of HA coated implant which was made by Sputtering method. It was also suggested the possibility of clinical next step experiment.

## Topic: Basic Research: Biomaterials and Surfaces

**P0415****Density comparison of two biomaterials used for sinus grafting**

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Nancy/France

**Aim:** The objective of the study was to compare the density of two grafting materials used in maxillary sinus floor augmentation, after six months healing.

**Material and Methods:** 28 patients were included in this retrospective study. They all needed sinus lift before implant placement. Sinus lift procedures were performed using glass ceramic (Perioglas) or deproteinised bovine bone particles (Bio oss, DBBP). Fourteen were grafted with glass ceramic and the other fourteen were grafted with DBBP. Six months later, cone beam computer tomography was realised. Density measurements were obtained using Simplant software.

**Results:** Mean density values, expressed as Hounsfield Units were 725,41 HU in the ceramic glass group and 975,09 HU in the DBBP group. Respective standard deviations were 252 and 438.

**Conclusion:** Mean density value was higher in DBBP group than in glass ceramic group, but the range was much greater when DBBP was used. Our study is only meant to compare mean density values obtained with two different grafting materials. Histological analysis will be necessary to evaluate the correlation between the density measurements and the nature of the material after six months healing.

## Topic: Basic Research: Biomaterials and Surfaces

**P0416****Comparative study regarding the distribution of microbial biofilms on the surface of some common materials used in oral implantology**

M. Burlibasa, L.A. Muntianu, G. Tanase, D.C. Bodnar, R. Sfeatcu, I. Ionescu, S.G. Dumitru

Bucharest/Romania

**Aim:** The constitution of a microbial strains collection isolated from dental plaque. We studied the development of the monospecific biofilms on the surface of materials commonly used in oral implantology, in order to establish the influence of the physical and chemical structure of the materials for implants with the dynamics of experimental biofilms.

**Material and Methods:** The analysis of bacterial diversity of dental plaque samples was realised with: optic microscope, scanning electronic microscope, determination of bacterial loading, identification of the most important bacterial species and genus after cultivating and isolation in anaerob and aerob media and also automatic identification with VITEK systems. Were tested the patogenicity and the virulent status and also the resistance of the cells with no adherence and of the cells included in artificial developed biofilms on the materials used in oral implantology. Selected materials were: titanium, titanium-based alloys (Ti Al6V4, TiAl6Nb7) and zirconium (in the form of zirconium oxide).

**Results:** Dental plaque has a great structural complexity (there are, in the same time: spiral bacterium, fungus, some gram-positive and gram-negative morphological types) and physiological (aerob and anaerob respiratory type). Tested strains have a high capacity of adherence on the oral implantology materials above mentioned, even after 24 hours of incubation. These bacteria are more resistant in adhered state comparing with initial condition.

**Conclusion:** Repartition of the selected monospecific microbial biofilms on materials used in oral implantology is determined by antiseptic potential of the titanium alloys components. Microbial biofilms appeared preferentially in surface irregularities, while on flat surfaces bacteria formed a continuous layer.

## Topic: Basic Research: Biomaterials and Surfaces

**P0417****Preliminary research study on the bioactivity of titanium and Ti6Al14V alloys**

E.L. Manoloiu, L. Burlibasa, I. Roman, L. Soare, S.G. Dumitru, M. Sandulescu, M. Burlibasa

Bucharest/Romania

**Aim:** Biocompatibility and bioactivity of a dental implant made of titanium or Ti6Al14V alloys ensure the success of its insertion into living tissues. This bioactivity of the metallic materials of which dental implants are made, is detected by generating "in situ" hydroxyapatite on their surface.

**Material and Methods:** For this research study, we used ten titanium and Ti6Al14V samples: simple samples, sandblasted samples, sandblasted and washed samples and sandblasted, washed and oxidised samples. The "in vitro" testing was done by keeping samples in a synthetic biological solution at a temperature of 37 degrees Celsius (thermostat Lauda E200, shaft 91) for 192 hours. Finally, samples were dried in an exsicator for 48 hours, after a preliminary wash in distilled water, by simply and slow immersion. After drying, all samples were examined with a scanning electron microscope Quanta INSPECT F. The deposited salt layers morphology was examined, and the estimates of this hydroxyapatite in samples were based on assessing the existence of phosphorus and calcium in the surface layers. Estimating the intensity of spectral lines of titanium, the metal base of samples is diminished by the presence of a salt layer on the surface.

**Results:** All samples have shown that phosphorus and calcium compounds own surface formation capacity in Hank solution at 37°C, with uniform and general globular aspect.

**Conclusion:** The deposited layer is very thin and consists of easily crystallized hydroxyapatite, under nanometric forms, which shows the bioactivity of titanium and Ti6Al14V alloys used in our research study.

## Topic: Basic Research: Biomaterials and Surfaces

**P0418****Effect of Infection Control Procedures on the Accuracy of Implant Impression Systems**

A.A.F. Al Dosari

11545/Saudi Arabia



**Aim:** The aim of this in-vitro pilot study was to evaluate the effect of sterilization of the implant analog and coping on the accuracy of impressions

**Material and Methods:** A master casts was constructed, with a pair of 4.1 mm x 12 mm Straumann® Standard plus implant, SLA fixtures (Straumann® Institute, Waldenburg, Switzerland). Ten pairs of ITI copings (RC Impression post open tray, Straumann Institute, Waldenburg, Switzerland) were used to make the impression. Implant analogs (RC bone level implant analog, Straumann Institute, Waldenburg, Switzerland) were then attached to the copings and ten sets of duplicated casts were prepared and numbered. Baseline measurements were taken for all the ten casts using a travelling microscope. Two out of the ten sets of duplicated casts were randomly selected to be the control group (Cast Number 4 and 5). All the ten casts were manually broken and the analogs were retrieved. Excluding the control group, the remaining eight pairs of analogs and copings were sent for one cycle of sterilization. The analogs were reattached to the copings and a new set of duplicated casts were prepared. The distances between the copings were measured using traveling microscope and compared to the distance in the master casts. The same procedure was followed after sterilizing the analogs and copings five times and then ten times.

**Results:** No significant difference was observed in the mean value of the measured distances on the duplicated casts after sterilization.

**Conclusion:** Sterilizing the implant components did not influence the accuracy of the impressions made.

Topic: Basic Research: Biomaterials and Surfaces

## P0420

### Peri - implant diseases: prevalence and risk factors

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Kaunas/Lithuania

**Aim:** To describe the prevalence and risk indicators of peri-implant diseases including peri-implant mucositis and peri - implantitis

**Material and Methods:** A MEDLINE search (PubMed) was conducted and work published between December 1990 and December 2010 in English language was included in the review. Keywords used: 'peri-implantitis', 'peri-implant diseases', 'peri-implant mucositis', 'dental implants and risk factors', 'dental implants and biological complications', 'prevalence of periimplant disease', 'prevalence of periimplantitis'. Cross-sectional and longitudinal studies including ≥30 implant-treated subjects exhibiting a function time of ≥5 years were considered. The search resulted in 3645 articles. Full-text analyses was performed from 149 potentially relevant publications. 38 studies full-filled the criteria and were included to the review.

**Results:** Cross -sectional studies reported that peri-implant mucositis occurs in 73-92%, peri-implantitis in 1-27,4% of the implants. 5 controlled clinical trials documented that periodontitis patients are 2,6 - 5 times more prone to have peri-implant disease as compared with non-periodontitis patients. Bad oral hygiene was highly associated with peri-implantitis with an OR=14,3; CI (2,0-4,1); 95%. 11 studies reported that smokers are at higher risk to develop peri-implant disease. There are few studies, describing the association between diabetes (1 cross - sectional study), genetic polymorphism (5 studies), alcohol consumption (1 perspective study) and peri-implant infection.

**Conclusion:** Perspective studies show higher prevalence (27,4%) of periimplantitis among the implants that are in function for about 5 years, while the cross - sectional studies shows the higher probability of periimplantitis (24,8%) and periimplant mucositis (93%) among implants that are at function on >10 years.

Topic: Basic Research: Biomaterials and Surfaces

## P0421

### Influence of Ti surface characteristics on the angiogenic behaviours of endothelial cells in co-culture with osteoblasts

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**Aim:** Wound healing following implantation is a complex biological process in which the interaction between angiogenesis, osteogenesis, and Ti surface characteristic are involved. The present study aim to evaluate in vitro the angiogenic behaviour of endothelial cells grown in monolayer co-culture with osteoblasts on different Ti surfaces.

**Material and Methods:** Human umbilical vein endothelial cells (HUVECs) and osteoblast-like cells (MG-63) were grown in direct co-culture for 48 h on four different kinds of Ti surfaces: acid-etched (A), hydrophilic A (mA), coarse-grit-blasted and acid-etched (SLA) and hydrophilic SLA (mSLA). Cell proliferation and the expression of angiogenic genes von Willebrand Factor (vWF), Thrombomodulin (TM), endothelial cell protein C receptor (EPCR), E-Selectin, VEGF receptor-1 (Flt-1), and VEGF receptor-2 (KDR) in HUVECs were measured by cell counting and real time PCR, respectively.

**Results:** Proliferation of both HUVECs and MG-63 seemed to be highest on the A, followed by SLA, mA and mSLA surfaces. The expression of vWF, TM, EPCR, and E-Selectin were significantly higher on A than on all other surfaces. In addition, the expression of EPCR was significantly higher on mA compared to mSLA. KDR expression was lowest on A surface compared to all other surfaces. The expression of Flt-1 was significantly higher on A than on SLA and mSLA.

**Conclusion:** In the present study, the behaviour of endothelial cells in monolayer co-culture with osteoblasts on different Ti surfaces was investigated for the first time. Under these conditions, smooth hydrophobic A surface promotes both proliferation and expression of angiogenesis associated genes in HUVECs.

Topic: Basic Research: Biomaterials and Surfaces

## P0422

### Effect of Infection Control Procedures on the Accuracy of Implant Impression Systems

A.A.F. Al Dosari, F. Al Tassan  
11545/Saudi Arabia

**Aim:** The aim of this in-vitro pilot study was to evaluate the effect of sterilization of the implant analog and coping on the accuracy of impressions

**Material and Methods:** A master casts was constructed, with a pair of 4.1 mm x 12 mm Straumann® Standard plus implant, SLA fixtures (Straumann® Institute, Waldenburg, Switzerland). Ten pairs of ITI copings (RC Impression post open tray, Straumann Institute, Waldenburg, Switzerland) were used to make the impression. Implant analogs (RC bone level implant analog, Straumann Institute, Waldenburg, Switzerland) were then attached to the copings and ten sets of duplicated casts were prepared and numbered. Baseline measurements were taken for all the ten casts using a travelling microscope. Two out of the ten sets of duplicated casts were randomly selected to be the control group (Cast Number 4 and 5). All the ten casts were manually broken and the analogs were retrieved. Excluding the control group, the remaining eight pairs of analogs and copings were sent for one cycle of sterilization. The analogs were reattached to the copings and a new set of duplicated casts were prepared. The distances between the copings were measured using traveling microscope and compared to the distance in the master casts. The same procedure was followed after sterilizing the analogs and copings five times and then ten times.

**Results:** No significant difference was observed in the mean value of the measured distances on the duplicated casts after sterilization

**Conclusion:** Sterilizing the implant components did not influence the accuracy of the impressions made

Topic: Basic Research: Biomaterials and Surfaces

**P0423**

### The effects of simulated bone loss on the implant-abutment assembly: An in-vitro Study

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**Aim:** Crestal bone around the dental implant can influence implant strength by protecting against mechanical failures including implant fracture. Aim was to investigate the effect of simulated bone loss on modes, load and cycles to failure using an in vitro model.

**Material and Methods:** Astra Tech narrow diameter (3.0mm) implants were mounted in Tufnol blocks and bone loss (BL) was simulated at 0, 1.5, 3.0, 4.5mm from the implant head. 40 implant abutment assemblies were tested using compressive bending (n=8), fatigue testing (n=32). Statistical significance was assessed using Fisher and Spearman-Rank test. Weibull and accelerated life testing analyses were used to assess reliability.

**Results:** Compressive bending showed that bone loss influenced the load bearing capacity of implant-abutment assemblies (0mm BL =394N, 4.5mm BL =297N). Cyclic fatigue testing showed that the modes, loads and cycles to failure had a significant relationship with progressive bone loss ( $P < 0.01$ ). All 16 samples with BL of 3.0mm and above experienced horizontal implant body fractures. In contrast 14 samples with 0 and 1.5mm BL showed abutment and screw fractures. Weibull and ALTA analyses indicated a two-group distribution as 0 and 1.5mm BL samples had better functional life and reliability, and are likely to survive longer with a probability of 95% when compared with 3.0 and 4.5mm samples.

**Conclusion:** Progressive bone loss had a significant effect on modes, loads and cycles to failure. In addition bone loss had an influence on functional life and reliability. Therefore

maintaining crestal bone level is important for biomechanical sustainability and predictable long-term function of dental implant assemblies.

Topic: Basic Research: Biomaterials and Surfaces

**P0424**

### The effects of mineralized bone allograft combined or not with a pericardial bovine membrane in the immediate extraction implantation (I.E.I) technique : A tomodensitometric and histometric observation in dogs

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**Aim:** The aim of this animal study is to evaluate the osseous resorption, the osseointegration and the quality of the newly bone formation resulting from the placement of allograft combined or not with a pericardial bovine membrane around implants in the I.E.I technique.

**Material and Methods:** Six mongrel dogs were used. The roots of the third and fourth mandibular premolars were removed. The four techniques were used in randomly selected socket (implant alone, with Puros cortical®, with Puros cortical® and internal or external placed membrane (Copios®)). The dogs were euthanized at 3 month. Tomodensitometric and histometric analysis were performed. The experimental sites were no demineralized sectioned. Percentage of bone loss at the buccal wall, of the remaining allograft particles and of the newly formed bone around the implant was calculated for each specimen.

**Results:** The volumetric observation indicate a systematic bone loss in the buccal-lingual direction as well as in the corono-apical with a higher loss when I.E.I was performed alone. The histometric analysis shows always the absence of allograft particles in contact with implant surface, but osseointegration and quality of newly bone formation were still improved.

**Conclusion:** In the dog model, the early implantation can't avoid the post-extractionnal resorption. However, the filling of the hiatus and the use of a membrane significantly improve the results of osseous quality and post-extractionnal resorption as well as osseointegration.

Topic: Basic Research: Biomaterials and Surfaces

**P0425**

### Effect of titanium surface decontamination using A Newly developed ultrasonic water jet cleaner

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**Aim:** It is well known that peri-implantitis is biofilm infectious disease. Although the most important step for the treatment of peri-implantitis is removal of biofilms from titanium surface, effective method of plaque removal is still not established. It is generally accepted that ultrasound generates the vibration of a

cleaning fluid and the accelerated water molecule, resulting in severs the debris on the surface of an object. This technology has been used as ultrasonic water jet cleaner "Pulse Jet" developed by Honda Electronics Co., LTD, Japan, for precise cleaning of silicon wafers and semiconductor parts. In this study, we examined the removal effect of the debris from titanium surface using water jet applying ultrasonic wave.

**Material and Methods:** We developed ultrasonic water jet cleaner "Pulse Jet Oral" attempting to pulse jet system (400 kHz, 1 MHz). For ex vivo biofilm formation, implant were embedded on oral stent and kept in human mouth for 3 days. After treatment with Pulse Jet Oral the distribution of retained bacteria on the titanium surface were examined using scanning electron microscopy (SEM).

**Results:** In the ex vivo implant model study, when we examined the titanium specimens treated with Pulse Jet Oral for 10 seconds, the biofilm was markedly decreased compared to the non-exposure control specimens.

**Conclusion:** These findings suggest that the ultrasonic water jet cleaner "Pulse Jet Oral" was able to remove ex vivo plaque biofilm from titanium surface significantly.

Topic: Basic science in implant dentistry

P0426

### Effect of Dental Implant Diameter on Fatigue Performance

K. Shemtov, L. Levin, E.E. Machtei, D. Rittel

Haifa/Israel

**Aim:** To evaluate the effect of diameter difference on the mechanical function and load-fatigue performance of dental implants.

**Material and Methods:** Three implants' groups with different diameters (3.3 mm, 3.75 mm and 5 mm), were loaded with static and cyclic compressive force using a servo hydraulic machine. In the cyclic test, the machine stopped working when the structure collapsed or reached 5X10<sup>6</sup> cycles without apparent failure. Load versus the number of cycles was plotted as curves for biomechanical analysis (S-N curve) for each implant diameter. Failure modes were documented using scanning electron microscopy.

**Results:** Quasi-static tests were carried out for each implant diameter to determine the failure load of the structure, so that all subsequent fatigue loads could be scaled with respect to this limit (ultimate failure loading). Six fatigue load magnitudes were chosen (between 40%-90%). The S-N curve plotted for the 5 mm implants showed fatigue limit (all tested implants, tested with the same scaled load magnitude reached 5X10<sup>6</sup> cycles without apparent failure) of 620N, 45% ultimate failure loading. For the 3.75 mm diameter implants, fatigue limit of 572N, 60% ultimate failure loading and, for the 3.3 mm diameter implants, fatigue limit of 438N, 65% ultimate failure loading. Using the scanning electron microscopy we were able to characterize the failure micro-mechanisms and fatigue characterization of each failed implant.

**Conclusion:** The results of this study indicate that, narrow diameter implants showed fatigue failures at load magnitudes which are much lower than those measured for the standard and the wide diameter implant.

Topic: Basic science in implant dentistry

P0428

### Is the new Laser-lok 3.0 implant a good choice for rehabilitation the anterior zone?

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**Aim:** In the aesthetic zone, it is recommended to place the implant head 2-3mm apical to the cemento enamel junction of the adjacent teeth. However an either crestal or subcrestal position often causes additional bone loss. This factor could affect the force distribution, the aesthetic rehabilitation and the future stability of the hard tissues. Recently a new implant, Laser-Lok 3.0, has been developed to allow its placement in narrow spaces. The aim of this study is to observe by finite element analysis, the influence of the Laser-Lok 3.0 implant position on force and stress distribution throughout implant and bone structure.

**Material and Methods:** Two maxillary lateral incisors computer models were created by a design program (ABAQUS 6.8.1). In the first model a simulated implant was placed in a subcrestal position (0.5mm) with a force of 100N in a 30 degrees direction. In the second model, the simulated implant was placed in a supracrestal position (0.5mm) with a force of 100N in a 30 degrees direction.

**Results:** In both models the distribution of forces is well tolerated by the implant and bone. However in the subcrestal position the stress in the coronal third of the implant is higher compared to the supracrestal model. The subcrestal implant position has more bone loss. This influences the capacity to absorb stress on bone and implant structure.

**Conclusion:** Within the limitations of this study we can conclude that the new implant Laser-lok 3.0 seems to be strong enough to stand the forces applied to a lateral incisor in both supracrestal and subcrestal positions.

Topic: Basic science in implant dentistry

P0429

### Fibroblastic proliferation on photoactivable caged cyclic RGD peptide coated titanium

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Strasbourg/France

**Aim:** Actually, osseointegration of dental implant is a biological well-known process in contrast with the cellular processes occurring in soft tissues around implant during wound healing. To improve proliferation of fibroblasts on titanium surface, we investigated the potential of a photoactivable caged cyclic RGD peptide coated titanium surface.

**Material and Methods:** Titanium samples were coated by using poly-lysine / poly-glutamic acid polyelectrolyte multilayers films (PLL/PGA films) and functionalized by a photoactivable caged cyclic RGD peptide in order to get a bioactive material with enhanced cell-adhesion properties. Biological properties of this bioactive material were investigated by fibroblast adhesion/

proliferation assays and the formation of adhesion structures.

**Results:** At 6 hours, short-time adhesion of fibroblasts is enhanced on titanium functionalized by the cyclic RGD peptide. Concerning long time proliferation (7 days), this effect is also observed. Interestingly, the increase of proliferation is associated with formation of focal adhesion structures reflecting a strong anchorage on the substrate.

**Conclusion:** The use of photoactivable caged cyclic RGD peptide coated titanium surface could be use at the dental implant's neck level to promote adhesion and proliferation of fibroblast and to improve the connective tissues-implant interface.

Topic: Basic science in implant dentistry

## P0430

### The effect of LED photobiomodulation following implant surgery on IL-1 Beta, PGE2, TGF-Beta and Nitric Oxide levels in peri-implant crevicular fluid

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Ankara/Turkey

**Aim:** LED photobiomodulation (PBM) is low intensity light therapy that modulates cellular activities without thermal injury. Following implant placement, levels of biological mediators such as cytokines, prostaglandins and free radicals are changed in peri-implant crevicular fluid (PICF). The aim of this study was to evaluate the effect of LED PBM on IL-1 $\beta$ , PGE2, TGF- $\beta$  and nitric oxide (NO) levels in PICF following 12 weeks of healing.

**Material and Methods:** 15 patients (7 tests and 8 controls) were participated in the study. Before implant surgery, full mouth plaque index, gingival index, pocket depth and bleeding on probing were recorded. Standard implant system (n= 22 implants) (Xive, Dentsply-Friadent, Mannheim, Germany) was used. In test group, LED light (Osseopulse<sup>TM</sup> AR 300, Biolux Research, Vancouver, Canada) was applied 20 min to surgical area three times in a week during three weeks starting from operation day. PICF was collected at 4 and 12 weeks postoperatively. PI, GI, PD and BOP were recorded for each implant in week 4 and 12.

**Results:** Levels of IL-1 $\beta$ , TGF- $\beta$ , NO and PGE2 did not show any difference in control and in PBM groups at all time intervals ( $p>0.05$ ). Implant stability showed a negative correlation with PGE2 ( $r=-.571$ ,  $p=.07$ ) and a positive correlation with NO ( $r=.472$ ,  $p=.031$ ).

**Conclusion:** PGE2 and NO levels in PICF can be used to detect early changes in implant stability following 12 weeks of healing. LED light therapy have positive impact on implant stability however, biochemical mediators in PICF did not reflect this effect.

Topic: Basic science in implant dentistry

## P0431

### Transfection of plasmid DNA encoding human interleukin-10 inhibits RANKL-induced osteoclastogenesis in RAW264.7 Cells

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Fuzhou/China

**Aim:** To explore the effects of gene transfection with plasmid DNA encoding hIL-10 on RANKL-induced osteoclastogenesis in RAW264.7 cells.

**Material and Methods:** Vector or hIL-10 plasmid was transfected into 293T cells with liposome and thus hIL-10 protein was obtained. TRAP staining and bone absorption experiments were carried out to identify the biological function of hIL-10.

**Results:** hIL-10 plasmid was transiently transfected into 293T and RAW264.7 cells successfully by liposome, with some cells emitting green fluorescence. ELISA detection confirmed that the target gene was expressed; RAW264.7 cells could be stably differentiated into osteoclast-like cells by RANKL, TRAP positive cells and bone resorption area significantly decreased ( $P<0.05$ ) in the culture system, which was added with hIL-10 protein.

**Conclusion:** The plasmids we used in this study could be transfected into 293T and RAW264.7 cells successfully by liposome, and the secreted hIL-10 protein had the biological function to inhibit osteoclast formation and bone resorption in vitro culture conditions.

Topic: Basic science in implant dentistry

## P0432

### Bone filling ceramics-triggered inflammatory reaction: a systematic review

F. Velard, J. Braux, D. Laurent-Maquin  
Reims/France

**Aim:** Calcium phosphate ceramics are widely used to fill bone defects. Bioactivity of those biomaterials governs their ability to be integrated in host tissue and to be replaced by newly formed tissue according to physiological matrix turnover driven by controlled and focused inflammatory reaction. Impairments in this system could lead to uncontrolled inflammatory host response. This study aims to provide a comprehensive review of synthetic calcium-phosphate interactions with inflammatory cells and the downstream events.

**Material and Methods:** A PubMed and EMBASE systematic search was used to extract data from studies involving inflammatory cells response to calcium phosphates. Titles and abstracts of all retrieved articles were read and papers dealing with calcium-phosphates synthetic biomaterial and inflammatory response were kept according to the chosen inclusion/exclusion criteria.

**Results:** 120 of 1004 articles were finally selected for this review and allow highlighting hallmarks of the host response to those biomaterials. It appears that physical characteristics of ceramics (size, shape, surface) were of major importance for in vitro response, but they had little influence on in vivo behavior. Chemical composition was also retrieved as an important factor and recent researches dealing with ion substitution and/or calcium-phosphate phases (HA, TCP, brushite) modulation demonstrate that it is possible to increase integration process and favor bone ingrowth regarding cytokine/chemokine network control.

**Conclusion:** Inflammatory response modulation could bring new approaches in the development of biomaterials. Despite the fact that calcium-phosphate ceramics demonstrate overall satisfactory results in clinic, it may be useful to consider functionalization as a potential way to bring significant progress in the field.



Topic: Basic science in implant dentistry

## P0433

### Prolyl hydroxylase inhibitors: A strategy for periodontal regeneration?

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**Aim:** Periodontal therapies can only to a limited extent support periodontal regeneration. Regenerative strategies require angiogenesis and reducing the catabolic activity of periodontal cells. We follow this strategy by stabilisation of the transcription factor hypoxia-inducible factor (HIF)-1 $\alpha$  with prolyl hydroxylase (PHD) inhibitors.

**Material and Methods:** We evaluated the impact of PHD inhibitors, also when released from bone substitutes, on intracellular HIF-1, production of vascular endothelial growth factor (VEGF) and on viability and proliferation of periodontal fibroblasts. Moreover, we assessed the impact of PHDs on the plasminogen activator system of periodontal fibroblasts and the impact on formation and activity of osteoclasts in murine bone marrow cultures.

**Results:** We found that PHD inhibitors increase the production of VEGF while cell viability and proliferation was only slightly reduced. Furthermore bone substitute materials can be successfully supplemented with PHD inhibitors to induce a pro-angiogenic response in periodontal fibroblasts. These pro-angiogenic effects of PHD inhibitors were paralleled by reduced plasminogen activation in periodontal fibroblasts and a decreased formation and activity of osteoclast.

**Conclusion:** Overall our results show that PHD inhibitors stimulate the pro-angiogenic capacity of cells from the periodontium while reducing the catabolic activity. Furthermore the results suggest that bone substitutes can serve as carriers for PHD inhibitors. Whether these results translate into enhanced periodontal regeneration will be addressed in upcoming preclinical studies. **Acknowledgment:** We acknowledge that this study was supported by grant RCL 653 from the International Team for Implantology (Basel, Switzerland). Here we give an overview on the work of our team on PHD inhibitors in oral tissue regeneration.

Topic: Basic science in implant dentistry

## P0434

### Enhancement of osteogenesis by ionic substituted biomaterials : an in-vivo study

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**Aim:** Ionic substitution is a promising technic to improve biomaterials. Calcium Phosphates (widely used bone filling materials) can be substituted with a wide range of ions. One of them (strontium) is known to act by reducing bone resorption and promoting bone formation. The purpose of this preclinical study is to test the capability of Sr-substituted calcium-phosphate to enhance osseof ormation in-vivo.

**Material and Methods:** 5%Sr-substituted Biphasic Calcium Phosphate (BCP5%) and "pure" BCP were synthesized via a sol-gel process. 36 mice were operated: After halothane anesthesia, critical defects were carried out in the femur and were randomly implanted with BCP, BCP5% or were left without any filling material. Three time points (7, 14 and 28days) were studied. X-Ray microtomography and histology permitted to obtain data regarding bone parameters. Non parametric statistical tests were used to prove the significance of our results

**Results:** Control highlight that mice were unable to spontaneously heal this kind of defects. Moreover healing induced a demineralization of the bone surrounding the defect as revealed by the decrease of bone parameters. Filling materials permitted to reduce the impact of this defect on proximal bone. Moreover the BCP5% powder had a capacity to enhance the osseof ormation of the border bone.

**Conclusion:** Ionic substitution is able to modify biomaterials in an osteogenic way and could represent a new approach in the biomaterials development.

Topic: Pre clinical models: implant therapy

## P0436

### Surface decontamination in the treatment of peri-implantitis in animal models

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Coimbra/Portugal

**Aim:** Perform a systematized review of various methods of implant surface decontamination used in the surgical treatment of peri-implantitis, tested in preclinical models.

**Material and Methods:** We performed a literature search of relevant articles published in the PubMed and EBSCOhost databases between 1993 and October 2011 in English. We included systematic reviews and meta-analysis of studies in dogs and monkeys, where peri-implant lesions were induced by plaque accumulation with a follow up at least of 2 months. As keywords we used: "Peri-implantitis", "Animal" and "Surgical treatment".

**Results:** From a total of 73 articles, four were selected: 4 systematic reviews, one of them with a meta-analysis. The analysis performed focused on the type and number of animals used, the surface of the implants, the method of induction of peri-implantitis and the method of surface decontamination, evaluating clinical, radiographic and histological findings.

**Conclusion:** There is a great heterogeneity among the various animal studies, so conclusions should be interpreted with caution. The different methods of decontamination associated with conventional surgical treatment resulted in partial values in terms of bone filling of the defects and of re-osseointegration. In most cases these values were reduced and are conditioned by the small number of animals used in each study, by the small number of studies that assess each method of surface decontamination, by the period of follow up, by individual variability and by factors inherent to the species. The use of studies with the same methodology and characteristics ensures valid and replicable results.

Topic: Pre clinical models: implant therapy

## P0437

### Implant Success Index (ISI): A new scoring system to evaluate the clinical outcomes of dental implants

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**Aim:** The classification system presented in this article based on clinical sign of inflammation (BOP), probing depth (PPD), soft and hard tissue levels around dental implants. If the soft tissue level (SL) placed coronal to reference line, we considered it as SL+ and if some recession happened and fixture threads or any part of rough surface exposed, we named it as SL-. The same score detected for hard tissue level.

**Material and Methods:** ISI classified in 9 scores

**Results:** ISI 1: SL+, PPD $\leq$  3mm, BOP-, HL+ (clinical healthy). ISI 2: SL+, PPD $\leq$  3mm, BOP+, HL+ (Mild mucositis). ISI 3: SL+, PPD $\geq$  4mm, BOP+, HL+ (severe mucositis). ISI 4: SL+, HL- (bone loss $\leq$  2mm or $\leq$  20%) (Mild periimplantitis). ISI 5: SL-, HL- (bone loss $\leq$  2mm or $\leq$  20%) (Mild periimplantitis plus mucosal recession). ISI 6: SL+, HL- (bone loss: 2-4 mm or  $\leq$  40%) (Moderate periimplantitis). ISI 7: SL-, HL- (bone loss: 2-4 mm or  $\leq$  40%) (Moderate periimplantitis plus mucosal recession). ISI 8: bone loss $\geq$  50% (Severe periimplantitis). And finally, ISI 9: bone loss $\geq$  50% circumferential (Clinical failure plus Clinical mobility).

**Conclusion:** Using this system would be useful in diagnosis, treatment plan, and provide better communication between researchers and clinicians.

Topic: Pre clinical models: implant therapy

## P0438

### Bone to implant interface enhancement by adding cementoblasts: a pilot study in rabbits

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**Aim:** Osseo-integration through a direct bone to implant contact (BIC) is the most widely accepted interface. The objectives of this investigation are to study whether isolated human cementoblasts may grow on implant sheets in vitro and whether human cementoblasts transported on collagen sponges may improve the implant-bone interface of implants placed on rabbits tibia.

**Material and Methods:** Human cementoblasts (4 passages) were plated on sheets of implants (Eckermann Laboratorium, Orihuela, Spain) and cultured for 20 days. For the in vivo assay a total of four 3-month-old New Zealand rabbits were used, 2 external-hex implants (3.5 x 8-mm) were inserted on both sides of the tibia at the union of the diaphysis and the proximal metaphysis. A trephine bur was used to create a circumferential defect of 4 mm around each implant, which were randomly filled with collagen sponges impregnated with either cementoblasts (1.5x10<sup>5</sup> cells) or saline (control). The implant to bone interface was studied by histological evaluation and morphometry.

**Results:** Isolated cementoblasts were able to grow in vitro on implant

sheets forming a cementum-like tissue expressing osteocalcin. The BIC for saline-coated implants was 24.9  $\pm$  11.6 and in the implant coated with cementoblasts, were 12.5  $\pm$  4.3. Therefore the length of bone surface in direct contact with the implant perimeter in the cementoblast group decreased by half, a new calcified tissue was formed between the implant and the bone.

**Conclusion:** The obtained results suggest that human, isolated cementoblasts grow on implants surfaces and favour the formation of a calcified-like interface between bone and implant.

Topic: Pre clinical models: implant therapy

## P0439

### Accuracy of cone beam computed tomography to assess the configuration and extent of ligature-induced peri-implantitis defects. A pilot study.

I. Mihatovic, J. Becker, V. Golubovic, F. Schwarz

Düsseldorf/Germany

**Aim:** To evaluate the accuracy of cone-beam computed tomography (CBCT) to assess the configuration and extent of ligature-induced peri-implantitis defects. A pilot study.

**Material and Methods:** Radiographic evaluation of advanced ligature-induced peri-implantitis defects (n=9) in canine was performed using CBCT (sagittal images) and compared with the corresponding histomorphometrical measurements of the respective site serving as a validation method. Deviations were calculated for defect height- (DW), and width (DW), as well as the supracrestal- (SC), and intrabony defect components assessed at both vestibular (v) and oral (o) aspects.

**Results:** CBCT analysis was closely correlated with histology at both vestibular [DH (-0.04 $\pm$ 0.59 mm), SC (-0.53 $\pm$ 1.48 mm), IC (+0.49 $\pm$ 1.18 mm), DW (+0.18 $\pm$ 0.54 mm)], and oral aspects [DH (-0.08 $\pm$ 0.63 mm), SC (-0.13 $\pm$ 0.44 mm), IC (-0.05 $\pm$ 0.62 mm), DW (+0.15 $\pm$ 0.48 mm)] (P>0.05; paired t-test, respectively).

**Conclusion:** CBCT may represent an accurate diagnostic tool to estimate the histological extent of advanced peri-implantitis defects.

Topic: Pre clinical models: implant therapy

## P0440

### Osseointegration in a sheep femur model of blasted-surface implants following spark-discharge oxidation.

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<sup>1</sup>Dunedin/New Zealand, <sup>2</sup>Jeonju/Korea

**Aim:** Spark discharge anodic oxidation forms a porous TiO<sub>2</sub> film on titanium, increasing surface roughness & calcium & phosphate ion concentration. This study examined oxidised implants with a novel thread design (paired small threads alternating with large threads coronally, alternate small & large threads apically) in an animal model of poor quality trabecular bone.

**Material and Methods:** Pairs of 3.5mm x 8.5mm-long titanium

implants (Osstem Implant Co. Ltd. Seoul, Korea), with blasted (control) or blasted & oxidised surfaces (test) were placed in the right femoral epicondyle of 8 sheep; sacrifice was after 1 month unloaded healing. Resonant frequency analysis (RFA) was measured at baseline and sacrifice using Mentor II. 2-3 ground sections per implant were digitised. Mean %BIC was measured using Image J @ x20 magnification for the best three consecutive threads per side.

**Results:** No implant failed to integrate. RFA detected no difference between the two groups (ISQ control:  $75.3 \pm 4.1$ ; test:  $76.3 \pm 1.7$ ;  $p=0.57$ ). Histometric analysis found a marked & statistically significant difference (%BIC control  $49.4 \pm 13.0$ ; test  $69.8 \pm 5.7$ ;  $p=0.02$ ). The thread design had no obvious effect on integration.

**Conclusion:** The novel anodic oxidation technique increased early osseointegration of rough-surfaced implants by 42% after one month unloaded healing. The clinical significance of this early bone-implant contact requires further examination in clinical models. The unusual thread design did not appear to enhance the integration of this implant in poor quality trabecular bone.

Topic: Pre clinical models: implant therapy

P0441

### Primary Stability of Implants placed at different angulations in Artificial Bone

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**Aim:** The objectives of this study was to evaluate the primary stability (PS) of implants with a progressive thread design (Ankylos C/X®, Dentsply, Tulsa, OK) placed in Type III and Type IV artificial bone materials.

**Material and Methods:** A total of 120 implants (i.e., 60 implants in Type III and 60 implants in Type IV) were placed using a surgical guide in commercially available polyurethane composite bone blocks (Pacific Research Laboratories, Vashon, WA). The angulations that were chosen to place the implants in both bone types were 0°, 10° and 20°. The implant dimensions were 11 mm in length and 3.5 mm in diameter. 2 clinicians placed all the implants and an independent clinician evaluated the PS using the Osstell (ISQ) and Periotest devices. The Chi-square test was evaluated to test for statistical differences between the PS at different angulations.

**Results:** The Osstell (ISQ) mean values for the 0°, 10° and 20° angulations in Type III bone was 55.23, 63.4, 62.1 and 52.03, 55.47, 54.38 for Type IV bone. The Periotest values for the 0°, 10° and 20° angulations in Type III bone was 6.3, 4.1, 2.8 and 7.6, 5.9, 7.3 for Type IV bone. The results showed that there was a statistically significant difference ( $p=0.02$ ) of the PS when measured using the Periotest among all 3 angulations in both bone qualities.

**Conclusion:** The primary stability (PS) of dental implants is critical for a successful final outcome. However, this is dependent on several factors including implant design, bone quality and surgical technique.

Topic: Pre clinical models: implant therapy

P0442

### Immunohistochemical analysis of guided bone regeneration at advanced ligature-induced peri-implantitis defects.

F. Schwarz, I. Mihatovic, V. Golubovic, J. Becker  
Düsseldorf/Germany

**Aim:** To immunohistochemically assess the influence of rhBMP-2 on the osteocalcin (OC) and transglutaminase 2 (TG2) (angiogenesis) antigen reactivity after surgical therapy of advanced peri-implantitis in dogs.

**Material and Methods:** At ligature-induced peri-implantitis defects, the intrabony component was filled with a natural bone mineral (NBM), and the supracrestal component was treated by either an equine bone block (EB), or implantoplasty. NBM and EB were soak-loaded with rhBMP-2 or sterile saline. Membrane (i.e. native collagen) protected sites were submerged for 12 weeks. OC and TG were assessed within the augmented- (AA) and pristine bone (PB) areas at non-exposed sites ( $n=6$  dogs,  $n=39$  defects).

**Results:** Within AA, both EB+rhBMP-2 and P+rhBMP-2 groups revealed significantly higher amounts of mineralized tissue (MT) over EB. Mean OC values were inhomogeneously distributed between groups, but more pronounced at non-mineralized tissue (NMT) than at MT areas. In all groups, mean TG2 values were comparable at both MT and NMT areas. AA and PB areas commonly revealed comparable OC and TG values.

**Conclusion:** In all groups investigated, AA revealed immunohistochemical characteristics comparable to those noted for PB and therefore may not be considered as qualitatively compromised bone.

Topic: Pre clinical models: implant therapy

P0443

### Peri-implantitis: Etiology, diagnosis and treatment: an update

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**Aim:** The aim of this study was to determine the current update about the peri-implant diseases

**Material and Methods:** We searched for the database starting from 1980 to January 2011

**Results:** The probing depth, the presence of bleeding on probing, suppuration and radiographs should be assessed regularly for the diagnosis of peri-implant diseases. Poor oral hygiene, smoking and previous history of periodontitis are known to be the main risk factors for the disease.

**Conclusion:** Peri-implant mucositis is described as the presence of inflammation in the mucosa around implants without any bone loss whereas in peri-implantitis, besides the inflammation in the peri-implant mucosa, loss of supporting bone is also seen. The probing depth, the presence of bleeding on probing, suppuration and radiographs should be assessed regularly for the diagnosis of

peri-implant diseases. Poor oral hygiene, smoking and previous history of periodontitis are known to be the main risk factors for the disease. The occlusion and the longevity of fixed partial dentures around implants, whether connected to the natural teeth or not, is still an area of investigation but studies show that the long term results are acceptable for both. Variable treatment modalities are discussed in relation to the management of peri-implantitis. The predictable outcome of the peri-implantitis management is yet unanswered.

Topic: Pre clinical models: implant therapy

## P0444

### cell therapy for extra-cortical vertical bone augmentation combining guided bone regeneration (GBR) and mesenchymal stem cells (MSC)

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Haifa/Israel

**Aim:** To augment extra cortical vertical bone by combining GBR, MSC and osteogenic transformed (otMSC)

**Material and Methods:** Rats' bone marrow derived MSC were isolated, cultured, osteogenic differentiated and characterized. Rigid gold capsules (5 mm height, 14 mm diameter) (GBR) filled with 0.2 gr TCP scaffold mixed with  $5 \times 10^5$  MSC (n=5) or otMSC (n=7) were fixed to the calvaria. Capsules filled with TCP alone (n=4) served as control (C). Rats were sacrificed after 3 months and capsules' content were processed for histology and stained with HE. Histomorphometric analysis included measurements of: maximal vertical bone height and bone area fraction (percent of bone in the augmented tissue)

**Results:** According to FACS analysis MSC are CD90 and CD44 positive but CD45 negative. otMSC are alizarine red positive. In all rats new augmented hard tissue filled the space under the capsule. Histological analysis revealed that mature cortical bone was continuous with the calvaria and occupied the lower and middle parts of augmented tissue. Particles of residual scaffold surrounded by vascularized connective tissue were dominant at the top of the augmented tissue. Mean maximal vertical bone height was approximately doubled, following addition of cells to GBR: MSC  $4.1 \pm 0.54$  mm, otMSC  $4.1 \pm 0.32$  mm, compared with (C) group:  $2.72 \pm 0.29$  mm ( $p \leq 0.01$ ). Bone area fraction was significantly increased in the otMSC ( $28.91 \pm 2.03$ ) compared with MSC ( $23.4 \pm 2.61$ ,  $p < 0.001$ ) and (C) ( $21.37 \pm 1.11$   $p \leq 0.02$ ).

**Conclusion:** This study shows that cell based therapy combining GBR with MSC or otMSC promotes vertical bone formation. These results open a new horizon in implant dentistry.

Topic: Pre clinical models: implant therapy

## P0445

### The effect of diabetes on bone regeneration therapy using BMP-2 gene transduced bone marrow stem cells in rats

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Seoul/Korea

**Aim:** Micro-computed tomography (micro-CT) has been widely used in the evaluation of regenerated bone tissue but the reliability of micro-CT has not yet been established. This study evaluated the correlation between histomorphometric analysis and micro-CT analysis in performing new bone formation measurement.

Diabetes related to the impaired wound healing because it affects differentiation and proliferation of bone marrow stromal cells (BMSCs). This study was aimed to investigate the bone regeneration at BMP-2 ex vivo gene delivery with BMSCs in diabetic rats.

**Material and Methods:** Critical-size calvarial defects were created using a 8mm trephine bur in a total of 24 Sprague-Dawley rats, and collagen gel mixed with autogenous rat bone marrow stromal cells (BMSCs) or autogenous rat BMSCs transduced by adenovirus containing bone morphogenic protein-2 (BMP-2) genes was loaded into the defect site. In the control group, collagen gel alone was loaded into the defect. After 2 and 4 weeks, the animals were euthanized and calvaria containing defects were harvested. Micro-CT analysis and histomorphometric analysis of each sample were accomplished and the statistical evaluation about the correlation between both analyses was performed.

Diabetes was induced using streptozotocin in Sprague-Dawley rats. Before and after induction, rat BMSCs were harvested by aspiration methods from tibia, which were cultured and transfected with BMP-2 gene by adenoviral vector. The proliferation and differentiation of the rat BMSCs from diabetic rats were evaluated by in vitro experiment. The bone regeneration in vivo was observed through subcutaneous implantation of collagen gel mixed with BMP-2 transfected rat BMSCs on the dorsal area of the animals. Animals were sacrificed after 4 weeks and histological examination was performed.

**Results:** New bone formation of the BMP-2 group was greater than that of the other group at 2 and 4 weeks in both histomorphometric analysis and micro-CT analysis ( $P = 0.026$ ,  $P = 0.034$ ). Histomorphometric analysis with a mean value of 3 sections. Measurement of new bone formation was highly correlated between histomorphometric analysis and micro-CT analysis, especially at the low lower threshold level at 2 weeks (adjusted  $r^2 = 0.907$ ,  $P < 0.001$ ). New bone formation of the BMP-2 group analyzed by micro-CT tended to decline sharply with an increasing lower threshold level, and it was statistically significant ( $P < 0.001$ ).

Diabetes was successfully induced, and the proliferation of diabetic BMSCs was similar to healthy BMSCs and ALPase activity was greater in the diabetic BMSCs. BMP-2 transfection did not show cytotoxic effects on the diabetic BMSCs, which were maintained the proliferative ability after BMP-2 transfection. The production of BMP-2 of the transfected diabetic rat BMSCs were lesser than of the healthy cells. The proliferation and differentiation of BMP-2 transfected diabetic BMSCs were normal. In vivo, ectopic bone formation was observed by subcutaneous implantation of BMP-2 transfected diabetic BMSCs after 4 weeks.

**Conclusion:** Both histomorphometric analysis and micro-CT analysis were valid methods for measurement of the new bone in rat calvarial defects and the ability to detect the new bone in micro-CT analysis was highly influenced by the threshold level in the BMP-2 group at early stage.

BMP-2 gene delivery on diabetic BMSCs was successful, although production of BMP-2 was less than healthy cells. The proliferation, differentiation and ectopic bone formation in vivo of BMP-2 transfected BMSCs was not impaired by diabetes.



Topic: Pre clinical models: implant therapy

## P0446

### A radiographic double blind study of periodontal probing around dental implants

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**Aim:** The aim of this study was to radiographically determine whether there are differences in terms of probe penetration around healthy implants versus those showing mucositis.

**Material and Methods:** Subjects with loaded dental implants were included in this case-control study. A clinical assessment was made to determine the health status of the periimplant soft tissues. A gutta-percha point with the same diameter as a periodontal probe was introduced in the gingival sulcus and a standardized radiograph was taken with the use of a millimeter grid to better enable further measurements on the radiographic image. A second investigator who was unaware of the clinical status measured the distance in millimeters from the tip of the point to the alveolar crest (PAC) on the radiograph and to the implant to abutment connection (PIAC).

**Results:** According to preliminary results the tendency shows no differences in PAC and PIBC in mucositis and healthy sites.

**Conclusion:** It appears from the preliminary results that there are no differences in PAC and PIAC between inflamed sites and non-inflamed sites around dental implants. Definitive conclusions cannot be made since this study is not yet completed.

Topic: Clinical trials in implant dentistry

## P0447

### Use of extra-short implants in oral implantology

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**Aim:** Several limiting factors encourage the clinician to use short implants. Among those, the presence of limiting anatomical elements and the simplification of surgical procedures are particularly significant. A systematic review concerning short implants (Telleman and coll, J of Clin Perio, 2011) shows the good results (93,1-98,6%) obtained with short implants (5 to 9,5mm long implants). The goal of this study is to see whether it is possible to extend the use of short implants to that of extra-short implants (implant length lower than 5mm).

**Material and Methods:** 7 patients (3 women, 4 men, average age 60,4 years old) received between November 2006 and May 2010 extra-short implants (implant Straumann®, palatal-ortho implant, length 4,2mm, diameter 4,1 or 4,8mm). The implants were located in partial fixed dentures (intermediate 4 cases, distal or mésial 6 cases) or single crown (1 case). The osseous stability (evaluated by comparison of standard retroalveolar radiography) and the attachment level were recorded after loading over a period of 6 to 49 months (average: 20 months).

**Results:** The results show (I) a survival and success rate of 100%, (II) stability of the osseous level in periphery of the implants and (iii) absence of significant difference between the average

attachment depth around the extra-short implants (3,32mm) and the contro-lateral teeth or implants (3,44mm).

**Conclusion:** This exploratory study relating to the use of extra-short implants (<5mm) shows reliability of use over a period going from 6 to 49 months.

Topic: Clinical trials in implant dentistry

## P0448

### Long term evaluation of crestal bone level around Straumann implants placed in posterior regions: A Retrospective 10 years study.

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Beirut/Lebanon

**Aim:** Dental implants have been accepted as a viable option for the treatment of fully and partially edentulous patients. Early clinical studies on dental implants observed a mean crestal bone loss ranging from 0.9 to 1.6mm occurring during the first year of function, whereas a mean annual bone loss ranging from 0.05 to 0.13mm was reported in the follow-up periods. As a result, a mean annual crestal bone loss of less than 0.2mm was recommended as one of the criterias for implant success. The aim of this study is to evaluate the crestal bone level around Straumann dental implants placed in the posterior region of partially edentulous patients.

**Material and Methods:** A total of 152 solid screw tissue level Straumann dental implants were consecutively placed in premolars and molars of 80 partially edentulous patients treated between 1999 and 2001. The mean loading time was 3 months. The time of prosthesis placement was considered time 0. Radiographs were taken at 1, 5 and 10 years after function.

**Results:** The mean observation time was 6 years (5-10 years). The mean annual crestal bone loss was 0.84mm during the first year of function and 0.025 during the follow-up period with no statistical difference between the first, third and fifth year of follow up.

**Conclusion:** In this retrospective study, it was clear that bone level around Straumann implants was stable in a follow up period up to 10 years. The data seem to agree with the results of other authors evaluating the longitudinal time performance of Straumann dental implants.

Topic: Clinical trials in implant dentistry

## P0449

### Global treatment in a severe periodontal disease

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**Aim:** The diagnosis of aggressive periodontitis is well known now with a rapid bone loss, no systemic illness associated, a family history of periodontal disease, no correlation between the bone destruction and the presence of dental plaque, and an important part of Aggregatibacter Actinomycetemcomitans and/or Porphyromonas Gingivalis. There is plenty of articles based on the long term survival rate in implantology on periodontally

healthy patients but what about periodontally compromised patients ? The question is still the same for the orthodontic treatment and the prosthodontic treatment too.

**Material and Methods:** This case report describes and argues the decisions for the treatment in a 58 years old female patient suffering of a severe aggressive periodontitis : We will describe first the initial phase. A surgical phase with full thickness flap and periodontal surgery in one hand and plastic surgery with connective tissue graft in the other hand are realized. An orthodontic treatment can be started after a third reevaluation and to prevent a relapse, a fixed retainer will be done with a final prosthetic treatment.

**Results:** The results are the following : Surgical therapy Reevaluation Implant placement Orthodontic treatment Plastic surgical therapy Prosthetic treatment Supportive periodontal therapy

**Conclusion:** The first part of the treatment controlled the infection and the second and third part (orthodontic, implant therapy, and prosthetic treatment) facilitated the correction of the consequences of the periodontitis. Because of the diagnosis of aggressive periodontitis, the patient is of course included in a severe supportive periodontal therapy in order to prevent any relapse.

Topic: Clinical trials in implant dentistry

P0451

### Comparison of two implant systems with regard to periimplant bone loss and its impact on soft tissue aesthetics

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**Aim:** of this retrospective, randomized study was to compare two implant systems with regard to their periimplant bone loss and its impact on soft tissue aesthetics.

**Material and Methods:** One implant, either AtraTech or Camlog, per patient in the aesthetic zone was chosen randomly for analysis, resulting in two groups, consisting of 19 implants each. Bone loss was calculated with post operative radiograph and the radiograph taken at the end of the evaluation period. The periimplant soft tissue aesthetics was evaluated with the Pink Esthetic Score. Therefore five dental professionals of the University Frankfurt evaluated the soft tissue aesthetics at the end of the evaluation period on intraoral photographs at two different time points in a random order.

**Results:** The Camlog group showed a longer mean follow up period and a higher prevalence of smokers. Bone resorption was more pronounced in the Camlog group with a mean bone loss of 1mm over a mean evaluation period of 5.84 years. Astra implants showed a mean bone loss of 0.5mm over a mean period of 4.16 years. Bone loss seems to be correlated with the aesthetic result. All implants which received a connective tissue graft showed higher PES values than those without connective tissue grafting, irrespective of the implant system used.

**Conclusion:** AstraTech implants show less bone resorption Both implant systems show an annual bone loss which is in agreement with the success criteria of Albrektson & Zarb (1986). Connective tissue grafting has a positive effect on soft tissue aesthetics

Topic: Clinical trials in implant dentistry

P0452

### Immediate loading of dental implants placed in severely resorbed edentulous maxillae reconstructed with Le Fort I osteotomy and interpositional bone grafting

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Bologna/Italy

**Aim:** Reconstruction and rehabilitation of atrophic maxillae with bone grafts is a lengthy and demanding procedure. This study reports about the immediate loading of 50 implants placed on six extremely atrophied edentulous maxillae reconstructed with Le Fort I osteotomy and iliac bone grafting. The aim is to demonstrate the possibility of shortening the treatment timing in the rehabilitation of extremely atrophied maxillae.

**Material and Methods:** Six patients, aged 49 to 68 years, with severely atrophied maxillae were treated with Le Fort I osteotomy and iliac bone grafting to allow for implant-borne prosthetic rehabilitation. Four to five months thereafter, 50 implants (7–10 per patient) were placed in reconstructed maxillae and immediately functionally loaded with a screw-retained definitive prosthesis. The patients were followed clinically and radiographically for 24 months after prosthetic loading.

**Results:** The grafting procedure and healing period before implant placement were uneventful in all patients. Two implants were lost within 2 months after prosthesis insertion in two patients, with an overall survival rate of 96%. Anyway the prostheses success rate was 100%. At the end of the follow-up period, all remaining implants appeared clinically healthy; crestal bone loss was >1.7 mm for six implants, resulting in a cumulative success rate of 84%.

**Conclusion:** Immediate loading of implants placed after Le Fort I osteotomy and interpositional iliac bone grafting could be considered a viable protocol to rehabilitate extremely atrophied edentulous maxillae, considerably reducing the treatment time.

Topic: Clinical trials in implant dentistry

P0453

### The bone tissue response at immediately loaded implants with or without abutments supporting fixed partial dentures. One year results from a randomised clinical trial.

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**Aim:** To assess implant survival and bone healing around implants supporting fixed partial dentures either loaded immediately or after 3–4 months.

**Material and Methods:** In this randomised, parallel-group, clinical trial 50 partially edentulous patients each received three implants. Two implants were fitted with abutments; one abutment with a TiUnite™ surface (Nobel Biocare®) and one abutment with a machine-milled surface. At one implant the suprastructure was attached directly to the

implant. After randomised allocation, implants were either immediately loaded with a fixed temporary bridge (test) or left unloaded for 3-4 months (control) when fixed bridges were manufactured. In the test group, the temporary bridge was replaced by a permanent fixed suprastructure after 6 months. Hard and soft tissue examinations were done pre treatment, at surgery, 2 and 14 days, 1 month, 3 months, and 1 year postoperatively.

**Results:** Implants were mostly placed posteriorly. RFA showed a decrease of ISQ between 2 and 4 weeks; significantly lower in the test group. 4 implants were lost in test and 2 in control. All other implants were stable after one year. Survival rates were 94.9% in test and 97.2% in control (NS). Mean(SE) marginal bone loss were 1.32(0.08)mm in test and 1.24(0.08)mm in control (NS). Significantly higher marginal bone loss was found at implants without abutment than at implants with abutment.

**Conclusion:** Acceptable survival rates for immediate and delayed loading of implants were found after one year. Similar marginal bone changes were found for both groups. Significantly higher marginal bone loss was found at implants loaded without an attached abutment.

Topic: Clinical trials in implant dentistry

## P0454

### Buccal bone thickness measurements around implants up to 1 year of loading: Proof of concept and Preliminary results.

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**Aim:** To test the validity of a specifically designed measuring device allowing long term follow up of buccal bone thickness (BBT) and to follow the evolution of buccal bone up to 1 year of loading.

**Material and Methods:** BBT was measured in 7 patients at implant surgery, abutment surgery (if 2 stages) and at 12 months post-loading. BBT was measured at the implant shoulder and 2, 4 & 6mm apically of it. Additionally, measurements with and without flap reflection were obtained from another 7 patients to assess the influence of soft tissue presence on the precision of the device.

**Results:** An average absolute difference of 0.19mm (SD=0.20) between the measurements with or without flap reflection was found. The average thickness of the buccal bone plate was 1.76mm at surgery and 1.39mm after 12 months. The average buccal bone thickness loss at implant level after abutment surgery was 0.06mm (SD= 0.29) and 0.33mm (SD= 0.06) after 1 year of loading.

**Conclusion:** The preliminary results validate the use of the new measuring device. A discrepancy of 0.2mm is considered as acceptable. A slight homogeneous BBT loss after 1 year of function is to be expected. Even though the measurements seem to indicate the absence of bone loss between the 1st and 2nd stage surgery, no conclusion can be drawn because of the limited amount of patients involved and because the loss at the coronal part of the buccal plate is compensated by the absence of bone loss at the more apical levels where no flap reflection was performed.

Topic: Clinical trials in implant dentistry

## P0456

### Immediate temporization of dental implants in anterior maxilla.

T. Eccellente, S. Capasso, U. De Gregorio, A. Rossi, M. D'Errico  
Grumo Nevano, Na/Italy

**Aim:** This study reports the clinical result of 39 immediately loaded implants in the anterior maxilla.

**Material and Methods:** 39 Ankylos implants were consecutively placed in 34 patients (13M,21F). All implants were used for single tooth restoration to replace 16 central incisors, 17 lateral incisors and 6 canine in Maxilla. 19 implants were immediately inserted after tooth extraction without flap elevation. All implants were immediately restored with pre-fabricated abutments cement-retained provisional crowns. At insertion, none of the restorations had centric or eccentric occlusal contacts with the opposing dentitions (immediate non-occlusal loading). Antibiotic therapy, chlorhexidine 0,2% mouth rinse and nutritional limitations are advised. The implants were restored with definitive restorations (fully functional occlusion) 4-6 months after implant placement. Standardized Periapical radiographs, mSBI, mPIL, technical complications, were recorded in different time intervals. Patient' satisfaction was evaluated.

**Results:** 1 implant was removed for mobility five weeks after placement. All other implants became osseointegrated. After a total loading period of 36 months (range 22 - 62 months) the overall survival rate was 97,4%. All implants presented a healthy peri-implant soft tissue conditions and stable gingival contour. Radiographic mean bone loss evaluating both interproximal surfaces was 0.96mm. No technical complication occurred. All patients appreciated treatment modality. One patient was not satisfied with the aesthetic of the rehabilitation.

**Conclusion:** The results of this study suggest that immediate temporization of implants in the anterior maxilla may give a satisfactory results in selected cases. The characteristic design of the implant-abutment connection plays an important role for the stability of peri-implant tissues.

Topic: Clinical trials in implant dentistry

## P0457

### Bone level changes around dental implants

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Grumo Nevano/Italy

**Aim:** This multicenter study analyzes the marginal bone loss around dental implants with taper-connection supporting fixed prosthesis.

**Material and Methods:** 125 patients (77F,48M) were consecutively enrolled in this study. A total of 367 Ankylos implants were inserted in healed sites. Implant length ranged from 8 to 14mm. All implants were inserted at least 1mm below the cortical plate. Marginal bone level using standardized radiographs were evaluated at the implant loading, 6, 12, 24 and 36 months later. Before second stage surgery, soft tissue thickness was clinically measured. Clinical parameters and all complications were noted. All patients were submitted in maintenance therapy.

**Results:** One implant was removed 3 weeks after implantation. After 3-4 months of healing, all other implants were osseointegrated and loaded with cemented crowns. 105 implants were loaded with single crowns, 199 with 83 bridgework and 63 to support 11 full-arch bridges. The total number of units replaced was 481. During a total loading period of 36 months, 3 implants were lost and the cumulative survival rate was 98,9%. Radiographic mean bone loss evaluating both interproximal surfaces was 0.67mm (range 0,35-1,93). The majority of implants presented healthy peri-implant soft tissue conditions (mPII=1, mSBI>1). Six patients reported ceramic fractures. No complications related to implant components occurred. Seven patients were not satisfied with aesthetic result.

**Conclusion:** It is concluded that a correct oral hygiene and the characteristic design of the connection significantly influence the peri-implant soft tissue and bone level stability. In case of thin gingival tissue, we can expect crestal bone loss in the process of biologic width formation.

Topic: Grafting/augmentation procedures in implant dentistry

## P0458

### Bone and soft tissue augmentation by orthodontic extrusion prior to implant placement in esthetic areas

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**Aim:** One of the most difficult problems arises when it is essential to place an implant at the site of an existing compromised tooth. The increased use of implants in dentistry has stimulated interest in augmenting bone in patients with deficient ridges. Orthodontic extraction by forced eruption has been suggested as a non surgical technique to manipulate hopeless teeth to modify their local environment increasing the amount of bone, enhancing the predictability of subsequent implant placement. The present cases illustrate the clinical outcome of immediately installing two implants following atraumatic extraction by orthodontic forced eruption.

**Material and Methods:** Two white female patients aged 40 and 42 were scheduled to extract the upper right central and lateral incisors respectively with poor periodontal and prosthetic prognosis. To give a diagnosis, clinical and radiographic examination were performed. One tooth had a root perforation and the other had a horizontal root fracture. A treatment plan was developed incorporating forced eruption intended to augment the alveolar bone volume, increase the width of keratinized gingiva and the subsequent implant placement.

**Results:** Following 12 months approximately of orthodontic treatment, teeth were successfully moved occlusally gaining 8 mm of vertical bone augmentation. Because of sufficient bone and satisfactory gingival dimensions, both implants showed adequate stability. The final prostheses were performed using a metal abutment and ceramic crowns.

**Conclusion:** Esthetic enhancement of the periimplant gingival margin and osseous profile through orthodontic extrusion was obtained. An interdisciplinary approach suggests the possibility of obtaining optimal results with high predictability.

Topic: Grafting/augmentation procedures in implant dentistry

## P0459

### Periotest Values of Implants Placed in Sockets Grafted with a Novel Calcium Phosphosilicate Putty Alloplast.

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**Aim:** The aim is to present periotest values of implants placed in 26 sockets grafted with a calcium phosphosilicate alloplast putty.

**Material and Methods:** Long term data on periotest values have shown that it can be an objective clinical measurement of the bone-implant interface to measure the implant stability. In all 22 patients (26 sockets), immediately after extraction, a bioactive calcium phosphosilicate putty graft was placed into the socket. A collagen plug was used to occlude the socket and sutured with resorbable sutures. 5-6 months post-grafting, an implant was placed in the area and periotest values were obtained.

**Results:** The average periotest value was  $-6.81 \pm 0.32$  from 26 cases. Periotest is capable of providing valuable information regarding changes in the bone implant interface. Lower Periotest value in this study is suggestive of good implant osseointegration.

**Conclusion:** Calcium phosphosilicate putty used as the graft substitute in this study has demonstrated bone that provides good initial implant stability at 5-6 months post-grafting and is a good choice for use in two stage implant surgeries.

Topic: Grafting/augmentation procedures in implant dentistry

## P0460

### Bone Grafting and Immediate Implant Placement after Extraction of an Impacted Canine: A unique case

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**Aim:** A 26 yr old female patient presented with pain and mobility associated with #10. Clinical examination revealed grade II mobility and missing canine. Radiographic examination revealed a horizontally impacted canine in the area. The aim was to restore the area with a bone graft substitute and place an implant immediately.

**Material and Methods:** The impacted canine was surgically exposed with a semi lunar incision and luxated out of the area. The involved lateral incisor was also extracted simultaneously. About 2cc of calcium phosphosilicate putty (NovaBone Dental Putty, NovaBone Products, Alachua, FL) (CPS Putty) graft material was placed in the huge defect of the extracted maxillary canine and covered with a collagen membrane and sutured. A 3.5mm/13mm implant was placed in place of extracted lateral tooth and an additional 1cc of CPS Putty. An immediate resin bonded prosthesis was given to protect the site.



**Results:** Radiographic examination after 6 months revealed good bone fill in the restored site. A longer term follow-up at 12 months shows trabecular pattern indistinguishable from adjacent unrestored area. A periotest value of -6.4 was recorded indicative of successful osseointegration.

**Conclusion:** This case demonstrates the efficacy of the novel calcium phosphosilicate putty for regenerating bone.

Topic: Grafting/augmentation procedures in implant dentistry

## P0461

### Post-extractive alveolar socket augmentation with or without collagen membrane: soft tissue early evaluation.

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**Aim:** Peri-implant soft tissue play a key role for functional and aesthetic success of implant rehabilitation. Grafting materials and absorbable membranes, alone or associated, were proposed for post-extractive alveolar ridge maintenance. Preservation technique may influence the healing of overhanging mucosa. This randomized double-blind controlled split-mouth clinical trial compared histological features of soft tissue overhanging augmented sockets covered or not-covered with collagen membrane.

**Material and Methods:** In five patients requiring extraction of 2 contralateral maxillary molar teeth, one post-extractive site was augmented with graft material (Bio-Oss Collagen, Geistlich) (control-group), the other site was augmented and covered with collagen membrane (Bio-Gide, Geistlich) (test-group). Following 5 weeks, samples of newly-formed soft tissue were harvested and processed for evaluation of vascularization (immunohistochemistry: CD31), collagen-content (histochemistry, Sirius-Red), inflammatory infiltrate (immunohistochemistry: CD3 for T-lymphocytes, CD20 for B-lymphocytes).

**Results:** In both groups, architecture of soft tissue appeared normally organized and connective tissue presented remaining graft-particles surrounded by mature collagen fibers. Microvascular content resulted significantly higher in control (8.22%) than test group (4.5%) (paired T-test:  $p < 0.05$ ). Inflammatory infiltrate and collagen-content were not significantly different in test and control groups (respectively T-lymphocytes: 1.53%, 0.63%; B-lymphocytes: 1.99%, 1.19%; collagen 35.6%; 40.7%). Intra-patient correlation (Pearson's) resulted significant for inflammatory infiltrate (T-lymphocytes  $r = 0.8$ , B-lymphocytes  $r = 0.93$ ), not significant for microvascular ( $r = 0.34$ ) and collagen-content ( $r = 0.18$ ).

**Conclusion:** Shortly after augmentation, membrane covering of graft material seems to influence vascularization of newly-formed overhanging mucosa. Significant intra-patient correlation of inflammatory infiltrate may be explained with hygienic conditions and genetic predisposition to inflammation. Vascularization and collagen-content do not seem correlated to these factors.

Topic: Grafting/augmentation procedures in implant dentistry

## P0463

### Replantation and extrusion of highly resected teeth - a new biological approach preserving dental bone structures for implant placement

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**Aim:** In this clinical pilot study the technique of replantation of root resected teeth and subsequent extrusion was investigated with focus on tissue preservation for implant placement.

**Material and Methods:** 12 teeth (test group) with bad prognosis but intact attached gingiva were extracted from 10 patients. The teeth were resected below the dento-gingival fibers, retrogradely root-filled, replanted and bonded to the adjacent teeth. After primary fixation for 10-14 days the teeth were extruded by elastic bands for about 1-2 mm within 2-5 days and then fixed again. Documentation was done by means of photographs, radiographs, DVTs and models. 5 teeth (5 patients) with bad prognosis were extracted only and served as controls (control group). After 3-6 months 12 implants were inserted in the test group, and stability and changes of soft- and hard-tissues were observed over 20-60 months period.

**Results:** All replanted teeth adhered without complications. The attached gingiva as well as the alveolar bone could be preserved. In no case the buccal bone-plate was lost. At 2 teeth a gain of bone could be observed. All implants placed showed almost no bone loss over the observation period. In the control group a strong resorption of the buccal bone was observed.

**Conclusion:** The replantation and extrusion technique allows predictable tissue preservation especially of the buccal bone plate and in some cases biological gain of tissue. Further studies are needed to prove the outcome of this pilot study.

Topic: Grafting/augmentation procedures in implant dentistry

## P0464

### Guided bone regeneration in the esthetic zone using white porous titanium granules and delayed implant placement : a case series.

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**Aim:** According to Buser, delayed implant placement (6 to 8 weeks after tooth extraction) associated with guided bone regeneration allowed for predictable esthetic outcome in terms of gingival margin position and papilla preservation for single crown. In this particular indication, GBR technique is aimed at regenerating the buccal bone along the implant surface so to obtain adequate gingival support and esthetic. As long lasting esthetic integration is mainly related to the position of the gingival margin and its stability over time, the use of non resorbable bone substitute should be preferably considered. The aim of this case series is to assess the impact of white PTG on the bone and soft tissue volume over time.

**Material and Methods:** Ten patients with one tooth scheduled to be

extracted in the esthetic zone have been recruited. Implants were placed 6 to 8 weeks after tooth extraction and GBR technic with porous titanium particles and resorbable membrane were used.

The clinical parameters are position of the gingival margin, width of the alveolar crest and bone level around the implant.

**Results:** the preliminary results show a normal position of the gingival margin compared with the adjacent teeth. The width of the alveolar crest seems to restore too. The radiographic evaluation show a very good integration of the porous granules and a good stabilisation of the bone around the implant.

**Conclusion:** the use of porous titanium granules and delayed implant placement seems to be a predictable procedure to obtain a normal position of the gingival margin which can promote esthetic results.

## Topic: Grafting/augmentation procedures in implant dentistry

### P0465

#### Horizontal ridge augmentation utilizing platelet derived growth factor (rhPDGF-BB) and demineralized bovine bone graft without the use of membranes

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**Aim:** Placing implants in the posterior mandible frequently presents a challenge due to inadequate bone quantity. Extremely narrow ridges require bone grafting procedures to allow implant placement. This requires harvesting autogenous bone or particulated bone grafts with the use of barrier membranes making surgical procedures technically demanding and increasing the risk of complications and graft failure.

The introduction of protein therapy in regenerative procedures could overcome the use of barrier membranes in certain cases making grafting procedures easier. Platelet derived growth factor (rhPDGF-BB) induces chemotaxis of osteogenic periosteal cells and animal and human case reports showed that membrane use could be excluded when this growth factor is used.

**Material and Methods:** Case reports

Two patients, a smoking and non-smoking needed bone grafting in the posterior mandible. They both had 1-2mm narrow non-contained ridges. rhPDGF-BB was combined with demineralised bovine bone and placed over the residual ridge without the use of membrane. Following releasing periosteal incisions flaps were primarily closed and this was maintained during 5 months of healing. In each patient 2 implants were placed and horizontal core biopsies were harvested and analyzed by micro-CT and histology.

**Results:** Discussion

The width of the ridges increased to 5-7mm. Implants successfully integrated and were reconstructed. Micro-CT and histology showed replacement of graft particles with new bone completely surrounding the particles. Radiographs showed stable bone levels around implants 1-year later.

**Conclusion:** Combination of rhPDGF-BB and particulated bovine bone without membrane placement successfully increased ridge width allowing implant placement. This treatment modality could simplify regenerative procedures and decrease complications.

## Topic: Grafting/augmentation procedures in implant dentistry

### P0466

#### Roll-flap combined with sub-epithelial connective tissue graft in the case of a too apically positioned implant

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Milano/Italy

**Aim:** The aim of this work was to present a mucogingival surgical technique capable of increasing the thickness of gum tissue around an implant placed too apically in the area 2.6 with bone atrophy, trying to raise the existing gum profile and reducing the discomfort reported by the patient (food stagnation).

**Material and Methods:** We performed a partial thickness flap (palatal - buccal translation), after scarification of the inner-buccal and outer-palatal peri-implant sulcus, rotating it on itself through the roll technique and allowing the juxtaposition of the resulting graft to the palatal and crestal scarified-rotated area. Three different partial thickness incisions were executed: two vestibular intra-sulcular and one horizontal on the palatal side. After dissection of the flap and suture of the palatal portion to the buccal side (resorbable suture 5/0), the epithelium-connective tissue was collected from the palate adjacent to the operated area. The graft was sutured to the periosteum on the vestibular side of the implant, inside the roll-flap previously prepared, and partially on the crest.

**Results:** The apical-coronal and bucco-palatal gum increase immediately proved to be fine. The peri-implant gingival biotype has been thus conditioned and surgically enhanced by the prosthetic management of the emergency profile of the temporary crown at first only provisional (screwed), then permanent (cemented).

**Conclusion:** Having resolved, as described above, an initial implant error, we obtained: improved adaptation of the final crown compared to surrounding tissues, improved uniqueness of the profile between peri-implant gum and prosthetic restoration, cancellation of the initially existing buccal depression to the provisional one.

## Topic: Clinical tips and cases: Grafting and augmentation

### P0469

#### Guided bone regeneration for implant placement – in search of aesthetic perfection

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Carvalhos/Portugal

**Aim:** There are still some difficulties when we need bone regeneration prior to implant placement. And if there is scientific evidence for horizontal regeneration, this is not true for vertical bone regeneration.

**Material and Methods:** Male patient aged 34 attended to the dentist with infectious lesion and presence of fistula in two abutment teeth of a 3 elements fixed partial denture. It was made the extraction of the abutment teeth (1.2 and 2.1) after 7 days of antibiotic treatment. In this approach was seen horizontal

and vertical bone loss. After 6 weeks of soft tissue healing was made a new approach for guided bone regeneration (GBR). For this GBR the soft tissue was removed with the help of piezoelectric scalpel, two autologous bone blocks of the mandible to be used in the receiving areas (1.1 and 2.1). After the blocks of autologous bone were placed the gaps were filled with Bio-Oss® and covered up the entire graft with non-resorbable collagen membrane Bio-Gide®. After 6 months implants were placed, Nobel Replace® Tapered Groovy (3.5 x 13mm). After 3 months the second surgical phase was carried and provisional crowns were made and screwed. The definitive all-ceramic crowns were placed after 12 weeks.

**Results:** The replacement of teeth can only obey the principles of aesthetics if the support tissues were also recovered and the new materials on the market allow a more predictable rehabilitation of the hard and soft tissues.

**Conclusion:** In the case presented the horizontal and vertical GBR allowed bone support for implant placement and a very natural aesthetic soft tissue.

Topic: Clinical tips and cases: Grafting and augmentation

**P0470**

### **Guided bone regeneration of a peri-implantitis defect. A case report with re-entry operation.**

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**Aim:** Regeneration of lost tissues and re-integration is the ultimate goal of peri-implantitis therapy. This case report presents regenerative treatment of a peri-implantitis defect with a re-entry operation.

**Material and Methods:** An adult female patient, with periodontitis history, light smoker and reporting high stress levels received an Ankylos implant to replace a missing central incisor. The implant was installed one-stage and loaded after 3 months with a cemented metal-ceramic crown. 2 years later, a peri-implantitis lesion was diagnosed, with fistula formation, suppuration and a 10mm pocket. Surgical regenerative therapy was performed. There was up to 6mm bone loss buccally and interdentally. After implant surface decontamination and debridement, the defect was filled up with Bio-Oss and covered with overlapping Bio-Gide membranes. The crown was kept into place and primary closure was achieved. Healing proceeded uneventful although recession of 3mm occurred. The patient received regular professional maintenance. Nevertheless, re-infection occurred probably related to the history of periodontitis, smoking, stress and/or incomplete defect resolution. A re-entry surgery was performed aiming for surface decontamination. After debridement it was apparent that the defect was partially closed. Bone gain ranged from 3 to 6 mm. A residual defect was present, limited buccally and extended 3mm apically. After treatment healing was uneventful.

**Results:** Information of the outcome and predictability of regenerative peri-implantitis treatment is scarce and RCT's are lacking. This case shows "proof of principle" with partial defect fill.

**Conclusion:** This is a case report and concrete conclusions cannot be drawn. Regeneration of peri-implantitis defects seems feasible but further investigations are needed.

Topic: Clinical tips and cases: Grafting and augmentation

**P0471**

### **Facing the facts: Peri-implantitis management. Clinical outcomes based on sound periodontal surgical principles. Case reports.**

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**Aim:** Peri-implant diseases include peri-implant mucositis, describing an inflammatory lesion of the peri-implant mucosa, and peri-implantitis, which encompasses loss of supporting bone. Cross-sectional studies have investigated potential risk indicators for peri-implant disease including poor oral hygiene, smoking, history of periodontitis, systemic conditions such as diabetes, genetic traits, alcohol consumption and implant surface. Evidence that probing using a light force (0.25 N) does not damage the peri-implant tissues and that bleeding on probing (BOP) indicates presence of inflammation in the peri-implant mucosa. The probing depth, the presence of BOP, and suppuration should be assessed regularly for the diagnosis of peri-implant diseases. Radiographs are required to evaluate supporting bone levels around implants. Numerous techniques have been proposed and none has been shown to be superior and effective in managing peri-implant bone loss. This may be because of the complex of etiological factors acting on the implant-supported prosthesis hence the treatment approach has to be individually tailored.

**Material and Methods:** Considering the lack of high-level clinical evidence on the management of peri-implant bone loss, we present a case based on sound periodontal surgical principles, in the management of peri-implantitis associated bone loss. Following mechanical and chemical cleansing (chlorhexidine and doxycycline) and disinfection, the lesion was subjected to a GBR procedure using a bovine xenograft bone substitute and collagen membrane.

**Results:** The results are seen after 6 months where clinical and radiographic resolution of the peri-implant bone loss can be seen. Re-osseointegration is possible to obtain on a previously contaminated implant surface and can occur in experimentally induced peri-implantitis defects following therapy. The amount of re-osseointegration, varies considerably within and between studies.

**Conclusion:** Implant surface characteristics may influence the degree of re-osseointegration. Surface decontamination alone can not achieve substantial re-osseointegration on a previously contaminated implant surface. However, true reosseointegration appears to be difficult to achieve.

Topic: Clinical tips and cases: Grafting and augmentation

**P0472**

### **GBR with non resorbable d-PTFE membrane and Bovine Derived Xenograft prior to implant placement in anterior maxilla: Two case reports**

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**Aim:** Introduction: Nowadays many implants are placed in the anterior maxillary region and other esthetically sensitive areas. The present report describes two patients with the indication of anterior teeth replacement with dental implants; without enough bone dimension due to bone loss.

**Material and Methods:** Case report: A 47-year-old female with the history of failed RCT of left central tooth and lost left lateral incisor and a 54-year-old male with the history of periodontitis were referred for evaluation and treatment. The central tooth in case one had root perforation and in case two the two central teeth had severe attachment loss which were considered hopeless and were extracted. After obtaining CBCT radiograph which revealed that the bone dimension was not enough for inserting implant, the GBR technique using Bovine derived Xenograft and non-resorbable high density PTFE membrane was decided for augmenting the region in both horizontal and vertical dimensions. After 8 months of healing in case one and 6 months in case two, CBCT was repeated to ensure of enough bone dimension changes and then implants were selected and inserted in the sites. After 4 months the second surgery was done and the healing abutments were tightened. The crowns were fabricated and temporarily cemented.

**Results:** Discussion: After 2 months of follow-up there were no soft and hard tissue changes. There was no sign of bone loss or mobility and the crowns were cemented permanently.

**Conclusion:** The present report indicates that successful implant therapy can be achieved in the esthetic zone with the GBR technique using bone graft material and non resorbable d-PTFE membrane.

Topic: Clinical tips and cases: Grafting and augmentation

**P0473**

### Treatment of Congenitally Missing Lateral Incisor in a Multidisciplinary Aspect

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Istanbul/Turkey

**Aim:** Achieving ideal esthetic result in the anterior region is very challenging, especially in cases such as congenitally missing teeth

**Material and Methods:** In February 2008, 27 years old female patient applied to our clinic because of congenitally missing maxillary lateral incisors. After clinical and radiographic examination, it has been decided to send the patient to the Department of Orthodontics for getting enough space. After the orthodontic treatment it has been decided to place autogenous bone block graft harvested from the symphysis region to both sides. 5 months later, 3,8x12mm Biohorizons Laser-Lock implants were placed. Provisional crowns cemented 3 months later to achieve an emergence profile. Because the lack of interdental papilla about 1 mm at tooth 12 we decided to perform a connective tissue graft. Permanent porcelain crowns cemented at the end of the procedure.

**Results:** Implant restoration with an interdisciplinary approach provides an alternative way with predictable clinical results for patients with congenitally missing teeth. Satisfactory esthetic and functional results were achieved for this case.

**Conclusion:** Implant therapy requires comprehensive preoperative planning and precise surgical execution based on a restorative-driven approach.

Topic: Clinical tips and cases: Grafting and augmentation

**P0474**

### Effect of Platelet-rich fibrin on Implant Stability

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**Aim:** Achieving accelerated implant osseointegration would provide immediate or early loading of implant supported restorations. Platelet-rich fibrin (PRF) is widely used to accelerate soft and hard tissue healing. Activated platelets in PRF secrete growth factors resulting cellular proliferation, collagen synthesis and osteoid production. The aim of this study was to compare the stability of dental implants inserted with one-stage surgical protocol with or without PRF application.

**Material and Methods:** Twenty-five healthy patients with adequate alveolar bone, having at least 2 adjacent missing teeth extracted at least 6 months ago were included in this study. Two tapered implants (Ankylos, Dentsply, Friadent) were placed to each patient. After surgical preparation of implant sockets, preoperatively prepared PRF was placed randomly to one of the sockets (PRF+). Acellular plasma portion of PRF was used to wash the implant placed into the PRF-coated socket. Resonance frequency measurements were made by Osstell ISQ intraoperatively and on the post-operative first week, and the following first month.

**Results:** First week mean ISQ values were  $69,39 \pm 11,87$  for PRF+ and  $58,87 \pm 13,03$  for PRF- ( $P < 0,001$ ). First month mean ISQ values were  $77,78 \pm 6,56$  and  $67,70 \pm 16,25$  respectively ( $P < 0,002$ ). No significant differences were found for insertion torque, implant length, diameter and bone density values between two groups.

**Conclusion:** Results of this study demonstrated that PRF application increases implant stability during the early healing period. Simple application of this material seems to provide faster osseointegration.

Topic: Clinical tips and cases: Grafting and augmentation

**P0475**

### Beneficial effects of creating a zone of keratinized peri-implant tissues in the mandibular posterior region. A case report

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**Aim:** Introduction: Whether presence of keratinized peri-implant mucosa is indispensable for implant stability and long-term success is controversial. The existence of a band of keratinized tissue of a certain width may be more or less important in different situations. This case report demonstrates the resolution of local soft tissue problems around implants in the lower posterior region by creating a zone of keratinized tissue to facilitate plaque control and prevent peri-implant mucositis. In addition we show the formation of an optimal emergence profile for a new fixed reconstruction.

**Material and Methods:** Case report: A systematically healthy, non-smoking 62-year old man presented with two implants



with absence of attached keratinized mucosa in the posterior mandibular region. The mucosa was inflamed and proper plaque control was impossible. A free gingival graft, 18x9 mm in size, was taken from the palate. A collar of keratinized mucosa 3 mm large was generated around both implants. The dimensions of the newly created keratinized tissue remained stable over 9 month.

**Results:** A mean modified Plaque Index of 0.4, a modified Sulcus Bleeding Index of 0.5 and a mean probing depth of 2.3 mm indicated presence of healthy peri-implant tissues. New definitive crowns were inserted after 9 month. The patient reported absence discomfort, improved conditions for plaque control and high satisfaction with the final outcome (9 on a VAS scale from 0 to 10).

**Conclusion:** The placement of a free gingival graft improved the clinical situation around posterior implants and increased patient comfort and satisfaction.

Topic: Clinical tips and cases: Grafting and augmentation

**P0476**

### **Autologous Platelet-Rich Fibrin (L-PRF) in Enhancing the Healing of Extraction Sockets of Teeth with Severe Gingival Recession**

D.Y. Huang, S. Chui, Y. Huang

*San Gabriel/United States of America*

**Aim:** The presence of severe gingival recession around hopeless teeth poses an additional challenge in the execution of surgical procedures aiming at preserving the alveolar ridge. The aim of this study is to describe the use of PRF to enhance soft tissue healing in ridge preservation procedures.

**Material and Methods:** Ten patients who presented with hopeless teeth that had severe gingival recession were treated. After flapless atraumatic extraction, the socket was curetted thoroughly. Venous blood was drawn into tubes without anticoagulant and was immediately centrifuged (3300 rpm for 10 minutes). PRF formed as the mid phase of the centrifuged blood by the natural polymerization of platelets and fibrin. Extraction sockets were filled with a PRF plug, which was combined in some cases with CaSO<sub>4</sub> pellets as a filler material, and covered with a PRF membrane. The membrane was sutured to the adjacent tissues without primary wound closure. Healing was examined at 1, 2, 4 and 8 weeks.

**Results:** L-PRF membranes promoted rapid closure of the extraction sockets. Granulation tissue was evident in 48 hrs. Complete closure of sockets with soft tissue was achieved in 1 week. Clinical evidence of soft tissue keratinization was observed in 3 weeks. Radiographic evidence of bone fill was seen in 6 weeks. By 8 weeks tissues were mature enough to allow for implant placement with primary flap closure if desired

**Conclusion:** Results of this clinical study showed that PRF is effective in promoting regeneration of the hard and soft tissues in extraction sockets.

Topic: Clinical tips and cases: Grafting and augmentation

**P0478**

### **Collagene membrane Vs. no membrane in the lateral sinus lift procedure. Split mouth case report.**

M. Quevedo, A. Castellón, P. Altuna Fistolera

*San Cugat Del Vallès/Spain*

**Aim:** Sinus floor elevation with the lateral window technique is a well documented and tested procedure. Many technique variations and materials were described to achieve the new bone formation inside the maxillary sinus. The aim of this report is to compare the clinical and radiographic changes in a bilateral sinus lift procedure using a resorbable membrane in one side and no membrane in the other side.

**Material and Methods:** A 45 year-old male patient came to our dental school clinic seeking for a fixed rehabilitation in the upper jaw. A fixed implant-supported denture was planned. Both right and left maxillary sinuses were pneumatized and a bilateral sinus lift was needed to place implants in the posterior regions. Right sinus was grafted with a bovine xenograft and covered with a resorbable collagen membrane. Left sinus was filled with the same graft but no membrane was used to cover the lateral window due to operator complications. After the healing and graft consolidation, eight dental implants were placed in the maxilla for the fixed rehabilitation.

**Results:** Different radiographic bone density was observed in the CBCT between both sinuses after 7 months healing. In the right side was dense and well delimited and in the left was disperse and invaded by a less dense tissue.

**Conclusion:** The use of a resorbable collagen membrane in the lateral window after the sinus lift, improve the graft preservation, isolation and maintainance of the dimensions. And also avoid the migration and dispersion of the graft particles and the invasion of the connective tissue.

Topic: Clinical tips and cases: Grafting and augmentation

**P0479**

### **Autogenous block graft for the reconstruction of horizontal alveolar ridge defects: a case report**

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**Aim:** Alveolar ridge defects are challenging and several techniques are described in the literature to correct them, like guided bone regeneration with autogenous block grafts or with particulate bone substitutes and membranes. In moderate to severe horizontal defects, autogenous block grafts are routinely used in our protocol to solve them with predictability. The aim of our study is to present our experience with a case report.

**Material and Methods:** A case report of horizontal severe alveolar ridge defect in area of 2.1 is presented. The deficient ridge was corrected with mandibular retromolar block grafts. The block graft was obtained with a piezoelectric surgical device. Blocks were fixed with a single osteosynthesis screw, gaps were filled with a xenograft and covered with a collagen membrane. Tension-free suture was performed. After a 5 months healing period, the implant was placed with excellent primary stability. After 3 months healing period, a fixed provisional was installed and after 3 additional months, definitive prosthodontic rehabilitation was performed.

**Results:** In this case report, uneventful healing occurred and the patient was rehabilitated both functional and esthetically. This results are in accordance with actual literature, in which the survival rates and the aesthetic results are very satisfactory.

**Conclusion:** The use of the intraoral autogenous bone block graft for the horizontal reconstruction of the alveolar ridge is a predictable procedure associated with dental implants. In this case report, a good esthetic and functional result was achieved.

Topic: Clinical tips and cases: Grafting and augmentation

**P0480**

### Horizontal Ridge Augmentation Around Implant With Titanium Membrane and Deproteinized Bovine Bone Mineral in the Anterior Maxilla : A Case Report

Özen, S. Çınarcık, N. Nizam, E. Tamaç

Izmir/Turkey

**Aim:** The aim of this case report is to restore anterior horizontal defect at the time of placing implant with titanium membrane and bone graft.

**Material and Methods:** A 43 year old systemic healthy and non-smoker woman. She had a trauma history on her #11 tooth 3 years ago. The tooth was extracted and provisional tooth was made. In the surgery mid-crestal incision was made and full thickness flap was removed, two releasing vertical incision was made to see defect size. Then implant (Zimmer 4.1-11.5 mm) placed in defect. Two membrane-tacks (Frios, Friadent) were used to stabilize the apical part of titanium membrane (Frios Bone Shields, Friadent). Deproteinized bovine bone (Bio-oss) soaked with saline and positioned under the membrane to fill the defect. The membrane was finally secured coronally additional two membrane-tacks to achieve optimal stabilization. A releasing incision in the periosteum was made at the base of the buccal flap to achieve tension-free adaptation at closure. Closure was performed with 5.0 polypropylene interrupted sutures. A week later the sutures were removed. After 6 months, the membrane was removed and implant gingiva former was placed. After 15 days implant supported crown was made.

**Results:** After the 6 months of healing the membrane did not integrate with soft tissue and under the membrane there was only bone like tissue. And also sufficient hard and soft tissue would elicit esthetic view. Clinically 4 mm bone was gained.

**Conclusion:** At the time of implant placement in horizontal bone defect with using titanium membrane and bone graft is clinically successful and predictable technique.

Topic: Clinical tips and cases: Grafting and augmentation

**P0481**

### Clinical effects of platelet-rich fibrin; sinus floor augmentation

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Ankara/Turkey

**Aim:** INTRODUCTION: Platelet-rich fibrin (PRF) is fibrin matrix that contains high concentration of bioactive molecules like growth factors. This study aims to evaluate the newly formed bone after volume changes in maxillary sinus floor augmentation with platelet rich fibrin (PRF) and xenograft combination using clinical and computerized tomography (CT) technique.

**Material and Methods:** CASE REPORT: Sixteen sinus lift operation with combination of PRF and xenograft (Gen-Os, Osteobiol Dental Materials, Italy) were performed without placing implants by the same surgeon. Patients, who have blood platelet disorders, medication with aspirin before surgery, infectious and metabolic diseases, and radiotherapy, as well as acute or chronic sinus disorders were excluded. The patients' blood samples (10 ml) were performed by using technique as described by Choukroun et. al. The assessment of changes in bone height and width was performed by computed tomography (CT) three months after sinus lift operation.

**Results:** DISCUSSION: 6 months after lifting operation, panoramic radiographies and CTs were taken. According to CT results, the gain of bone height was at least 4, 56 mm to 8, 52 mm. Graft material also provided 10,7mm± 1,86mm gain with the width. New bone quality was better according to the surgeon's evaluation.

**Conclusion:** The results suggest that PRF is a reliable graft material for sinus floor augmentation procedure.

Topic: Clinical tips and cases: Grafting and augmentation

**P0482**

### Post-operative implant expolation in maxillary posterior region

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**Aim:** This poster presents case of early failure of two-stage dental implants manifesting in a spontaneous expolation into the oral cavity after sinus lifting with bone graft procedure.

**Material and Methods:** Two implants were inserted in left maxillary second premolar and first molar region with BAOSFE (Bone added osteotome sinus floor elevation). Five weeks later, the fixtures were extruded into the oral cavity, although good primary stability was established at the time of implant placement, we decided to remove the fixtures. After seven months of healing, two implants were inserted again but the same clinical phenomenon was occurred. In the biopsy, inflammatory cell infiltration and giant cells were observed.

**Results:** The displacement of an implant into the oral cavity is an uncommon but possible event. The major contributors to implant failure are contained infection, impaired healing, smoking, surgical trauma, foreign body reaction, and unfavorable loading conditions.

But in this case, we can not find any of significant cause related with implant expoliation.

**Conclusion:** The exact etiology of the early fixture loss in this patient is unclear, Further studies on the spontaneous extrusion of implants are required to uncover the causative mechanism.

Topic: Clinical tips and cases: Grafting and augmentation

## P0483

### Use of xenografts in 3D bone block reconstruction surgery. Two clinical cases.

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**Aim:** Introduction

Khoury has developed some years ago the three-dimensional bone reconstruction technique, where autogenous cortical blocks serve as a buccal and palatal walls and the space between them are filled with cortical and/or cancellous autogenous bone particles. However, sometimes is needed a big amount of bone particles to fill such space. Through two clinical cases, the use and the histological evaluation of a xenograft is shown as an alternative for filling the space between the blocks during a three-dimensional bone reconstruction surgery.

**Material and Methods:** Case report

Two clinical cases with severe vertical-horizontal defects, in the posterior and anterior maxilla, were treated with the three-dimensional reconstruction technique of Khoury. After the fixation of the autogenous block grafts on the buccal and palatal sides, particulate xenografts were used to fill the gap between the blocks. Bone biopses were obtained and histological analysis was performed.

**Results:** Discussion: Similar clinical and histological observations were in accordance to those found by Khoury in biopses obtained in areas where autogenous bone particles were used. Implant placement could be performed without any complication and partial to complete regeneration of buccal and palatal walls were found.

**Conclusion:** Within the limits of this case report we can conclude that the use of xenograft particles can be a good option when the space between cortical blocks is large and the obtention of big amounts of autogenous particles cannot be done during the three-dimensional bone reconstruction.

Topic: Clinical tips and cases: Grafting and augmentation

## P0484

### HORIZONTAL RIDGE AUGMENTATION BY MANDIBULAR SYMPHYSIS GRAFT: REPORT OF A CASE.

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*Madrid/Spain*

**Aim:** Tooth extraction leads to loss of bone volume, causing the appearance of narrow ridges for implant placement. Currently, a narrow ridge is no longer an absolute contraindication for implant

placement. There are different techniques and materials to achieve guided bone regeneration, although "gold standard" is obtained with autogenous grafts. The purpose of this case report was solving the alveolar ridge defect with monocortical blocks of mandibular symphysis, to rehabilitate the area with dental implants.

**Material and Methods:** Woman, 30 years old, non-smoker, with irrelevant medical history, who came to the Oral Surgery, Periodontics and Implants postgraduate service at the University Hospital Alfonso X. She had an edentulism of long evolution of three upper incisors due to trauma. The alveolar ridge showed a severe horizontal defect (seibert type I) that prevented the placement of implants. Thus it was necessary to perform a ridge augmentation using two blocks monocorticals of mandibular symphysis; filling the gaps with particulate xenograft and covering it with collagen membrane.

**Results:** After reentry at 6 months we observed enough width to proceed to rehabilitation with implants.

**Conclusion:** The use of blocks of mandibular symphysis is safe and predictable, has low morbidity and good acceptance by the patient. Being a membranous bone has less resorption and revascularization is faster than endochondral bone graft full thickness. There are also similarities in the procollagen from the donor and the recipient and a higher concentration of BMPS, which allows a greater capacity for bone regeneration.

Topic: Clinical Research: Implant Therapy outcomes

## P0485

### The outcome of a novel tapered implant in a private practice limited to Periodontology.

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**Aim:** Recently a novel implant with continuously changing threads and a special core has been developed to provide a more stable tissue support and an increased primary stability. Unfortunately scientific data on the outcome of this new implant is scarce. The aim of this research is to investigate the clinical behavior of this implant.

**Material and Methods:** 172 subjects (mean age 53.1 years), 85 males and 87 females, who required single-tooth prosthetic replacement for a missing tooth, a partial bridge, full bridges were recruited. A total of 466 self-tapping implants (NobelActive) – 70.2 in the maxilla and 29.8 in the mandible – were installed, in a one (85.25 %) or two-stage (14.75 %) procedure. Intra-oral, long-cone radiographs were taken at implant insertion, at the completion of the prosthetic treatment, and at each yearly follow-up visit. The analysis of peri-implant bone level alteration was performed by 2 independent researchers, who re-evaluated the scores in case of 1 mm inter-examiner difference.

**Results:** Three implants were lost. The overall cumulative failure rate at 3 years was 99.1 % (implant level). The mean loss of bone during the first 4-6 months, due to the bone remodelling process was 0.14 mm (SD= 0.67). The loss of marginal bone at the implants during the first year in function was 0.21 mm (SD= 0.68). During the subsequent year the annual change in peri-implant bone level was estimated to be 0.04 (SD 0.28).

**Conclusion:** This "field" study clearly indicates the optimal clinical outcome of the novel implant in often demanding situations. The mean annual bone loss, is far below of what has been published so far for other implant systems.

## Topic: Clinical Research: Implant Therapy outcomes

**P0486****Surgical treatment of peri-implantitis using mechanical debridement with or without an air abrasive device: A randomized, controlled clinical trial**

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Bruxelles/Belgium

**Aim:** The aim of this prospective, randomized controlled trial was to evaluate the additional benefit of an air-abrasive device (Perio-Flow®) during surgical treatment of peri-implantitis.

**Material and Methods:** Twenty patients, each of whom displayed at least one implant with peri-implantitis (PPD 4-10mm) were treated using either 1) surgical debridement using carbon curettes, cotton pellets impregnated with NaCl (MG) or 2) surgical debridement using carbon curettes, cotton pellets impregnated with NaCl and the Perio-Flow® device (MDG). Clinical and radiological parameters were recorded at baseline (T0), 3 (M3) and 6 (M6) months after treatment (PII, BoP, PPD, and BL).

**Results:** At 6 months, both groups (MG and MDG) revealed significant reductions in mean PII scores (respectively 82% VS 59%) (p inferior to 0.05) and BoP scores (respectively 73% VS 56%) (p inferior to 0.05). Both groups also exhibited a moderate decrease in PPD from baseline but this was more important in MG group than in MDG one (1, 2mm±2.15 for MG VS 1,9mm±1,1 for MDG). Regarding BL scores, MG revealed slight variations whereas MDG trended to present bone gain (0,1mm±1,5mm for MG VS 0,5mm±1,7mm for MDG).

**Conclusion:** Despite this study showed in both groups a significant reduction of the peri-implant inflammatory process after 6 months and a promising bone gain for patients treated with the air abrasive device, a longer follow-up would be needed to confirm the stability of these results and the benefit of adding this method of decontamination to the surgical procedure.

## Topic: Clinical Research: Implant Therapy outcomes

**P0487****Long-term survival of resin-bonded bridges.**

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Gent/Belgium

**Aim:** This retrospective cohort study evaluates metal-cast silan-coated resin-bonded bridges (RBB's) after at least 16 years and identifies co-variables affecting the survival.

**Material and Methods:** 56 patients with 65 RBB's placed by one operator between 1986 and 1993 were recalled and invited for a clinical examination. Dental records were also scrutinized.

**Results:** 22 RBB's were lost to follow-up after an average 56 months (SD = 40.9) and considered as unaccounted for; 21 failed prior to the research recall and had a mean survival of 111 months (SD = 73); 22 were still in function with a mean survival of 237 months (SD = 25) or almost 20 years. Based on 43 RBB's with available information from clinical records and inspection, the mean survival was 176 months (SD = 83) or nearly 15 years. The estimated, cumulative survival via Kaplan-Meier analysis of

the total number of 65 RBBs resulted in 86% (S.E. = 5%) survival after 5 years, 77% (S.E. = 6%) after 10 years and 54% (S.E. = 8%) after 20 years.

**Conclusion:** RBB's show acceptable survival although lower than conventional FPD and single implants. They should therefore be considered as a temporary provision; as a provision for geriatric or medically-compromised patients because of the simplicity of the provision; as a less expensive alternative and for patients where the amount of bone loss impedes the use of dental implants.

## Topic: Clinical Research: Implant Therapy outcomes

**P0488****A Multicenter Prospective Clinical Study:3-Year Follow-Up of Implant Survival in Augmented Extraction Sockets**A. Ismail<sup>1</sup>, I. Olszewska-Czyz<sup>2</sup>, M. Chomyszyn-Gajewska<sup>2</sup><sup>1</sup>Cairo/Egypt, <sup>2</sup>Krakow/Poland

**Aim:** Management of extraction socket following tooth extraction is considered a key factor for successful implant therapy. Several grafting materials have been utilized with varying degrees of success. The aim of the study was the assessment of viability of polylactic and polyglycolic acids' co-polymer FISIOGRAFT in socket preservation and implant survival in augmented sides.

**Material and Methods:** 37 adult patients indicated for tooth extraction and augmentation of the extraction socket by the use FISIOGRAFT were included in the study. Patients were recalled after 6-8 months for X-ray and implant placement. At the time of implant placement bone core samples were taken from the grafted site for histological evaluation. 54 implants with length 8mm-15.5mm and diameter 3.5mm-5mm were used. Patients were recalled after 6 months for final prosthetic restoration. Follow up was extended to 3 years.

**Results:** Radiographic and histological evaluation reveal that application of FISIOGRAFT in augmented extraction sockets provides a maximum ridge preservation and gives a good condition for implant restoration. 1 implant failed at the time of restoration (early failure). Histological evaluation reveals new bone formation with less than 2 % of residual material of polyglycolic and polylactic acids' co-polymer. 3-year follow-up yields a cumulated survival rate of 98%.

**Conclusion:** The results of 3-year follow-up of this study proofs that FISIOGRAFT is a viable material for socket preservation and ensures a high survival rate of implants in augmented extraction sockets.

## Topic: Clinical Research: Implant Therapy outcomes

**P0489****The Effect of LED Photobiomodulation on Implant Stability**

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**Aim:** Photobiomodulation (PBM) is the low intensity light



therapy by light in the far-red to near infrared region of spectrum to modulate numerous functions. Lasers and LED (light emitting diode) devices are used for PBM. The aim of this study is to evaluate the effect of LED PBM on implant stability during healing period.

**Material and Methods:** 15 patients (7 tests and 8 controls) were participated in the study. Full mouth plaque index, gingival index, pocket depth and bleeding on probing were recorded preoperatively. Standard implant system was used. In test group, Biolux-Osseopulse was applied 20 min to surgical area three times in a week during three weeks starting from operation day. In order to determine implant stability, resonance frequency analysis were performed by Osstell ISQ device and implant stability quotient (ISQ) were recorded at the time of implant placement, 2, 4, 8 and 12 weeks postoperatively. Clinical parameters were recorded for each implant in week 4 and 12.

**Results:** Implants in control group demonstrated significant reduction of ISQ values from baseline to week 12 ( $p=0,005$ ) while baseline implant stability was maintained during twelve weeks of healing in test group ( $p=0,156$ ). Clinical measurements were shown similar changes in both groups in week 4 and 12 ( $p>0,05$ ). Implant stability were not affected by bone quality.

**Conclusion:** LED PBM have significant influence on the implant stability during postoperative twelve weeks. Similar ISQ values were measured in type 2 bone and in type 3 bone in LED PBM and control groups.

## Topic: Clinical Research: Implant Therapy outcomes

### P0490

#### Treatment of peri-implant bone defects with platelet-rich fibrin

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**Aim:** Peri-implant bone loss is caused by mechanical or biological factors and is a common problem with the increasing number of patients receiving dental implants. Although there is no consensus on the most effective way to treat peri-implant bone loss, traditional periodontal infection control regimens, surgical access and regenerative interventions are performed. Platelet-rich fibrin (PRF) is an autologous fibrin matrix used to enhance bone regeneration. The aim of this clinical study is to evaluate the potential of PRF in the treatment of peri-implant bone loss.

**Material and Methods:** Eleven patients having at least two implants with radiographic crestal bone loss  $\geq 3$ mm were included in the study. Twenty-two defects were treated with access flap surgery, PRF was applied to eleven of them (PRF+). Probing depth (PD) and clinical attachment level (CAL) were recorded at baseline, first and third months.

**Results:** At first month PRF+ and PRF- groups demonstrated significant decreases in mean PD and CAL (PD:  $2,11 \pm 1,33$  vs  $1,2 \pm 0,5$  and CAL:  $2,25 \pm 1,69$  vs  $1,01 \pm 0,3$ ) when compared to baseline values ( $P<0,001$ ). Third month mean PD and CAL also significantly decreased for each group compared to baseline values (PD:  $2,79 \pm 1,28$  vs  $1,3 \pm 0,5$  and CAL:  $2,46 \pm 1,42$  vs  $1,05 \pm 0,23$ ) ( $P<0,001$ ).

**Conclusion:** Peri-implant bone defect treatment with PRF resulted to a reduction in PD and clinical attachment gain. Large scale studies are necessary to validate these initial results.

## Topic: Clinical Research: Implant Therapy outcomes

### P0491

#### A Clinical study of Implants placed simultaneously with maxillary sinus floor augmentations in the presence of maxillary antral pseudocysts

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Beijing/China

**Aim:** The therapeutic approaches of sinus augmentation and implants placed in the sinus with antral pseudocysts are still controversial. The aim of this article is to present a modified technique that could be used to treat patients with antral pseudocysts in the sinus who need sinus augmentation and to assess the incidence of late signs and symptoms of possible acute and chronic maxillary sinusitis after sinus augmentation.

**Material and Methods:** A total of 32 individuals (14 male and 18 female; 48 sinus augmentation procedures) were included in this study. All of them had CBCT scan and received a questionnaire and clinical and radiographic examinations. Eleven patients (12 sinuses) show radiographic dome-shaped opacity in the posterior maxilla sinus. And the other 24 patients (36 sinuses) were normal. Postoperative follow-up was 6-30 months.

**Results:** The sinuses were grafted with xenograft (Bio-oss (38 sinuses) and collagen resorbable membrane and Bio-gide (34 sinuses) (Geistlich Pharma Biomaterials, Wolhusen, Switzerland). In 30 operations (78%) implants were placed simultaneously, whereas in 8 (22%), a 2-stage approach was used. No excessive bleeding occurred during operation. In 8 sinuses (16.7%), membrane perforation occurred, treated by a resorbable membrane. No graft infection and acute sinusitis were noted. No implants were lost. Only one cases of chronic sinusitis were diagnosed by otolaryngologists 10 months after prosthetic loading (2.6%).

**Conclusion:** It is may not be necessary to remove a sinus cyst before sinus augmentation if the patient does not have rhinoboyon or headache symptoms and the cyst is not large. However, Patients presenting with preoperative sinusitis informed of the increased risk.

## Topic: Clinical Research: Implant Therapy outcomes

### P0492

#### Periimplant soft tissue alteration in relation to different periodontal biotypes and abutment connection surgical techniques

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**Aim:** The aim of this study was to investigate the effect of four surgical techniques for abutment connection on the periimplant soft tissues according to the periodontal biotype including mid crestal incision, c-shaped palatal lingual incision, soft tissue punch removal and papilla preservation (Palacci technique).

**Material and Methods:** 57 patients, partially edentulous, were included in the study (total of 86 implants). The prosthetic restoration was placed approximately one month after abutment

connection. The participants were randomly allocated to each surgical technique for abutment connection. The location of the perimplant marginal soft tissue as well as the thickness and width of the keratinized mucosa were assessed at baseline during abutment connection, one and four months after placement of the supraconstruction. Mean values and standard deviations were assessed using the implant as the statistical unit.

**Results:** Four months after prosthesis installation a mean apical displacement of the labial soft tissue margin of 0.7 mm was observed. In 27,3% of the implants a soft tissue recession at the vestibular implant site was recorded in patients with thin biotype, while in the thick biotype the corresponding value was 7.1%. Among the different surgical techniques that were utilized for abutment connection, the simple crestal incision technique presented the most satisfying results, in both biotype groups in terms of periimplant soft tissue recession and increase of keratinized mucosa. Smoking was strongly correlated with soft tissue recession.

**Conclusion:** Alterations of periimplant soft tissues after second stage surgery for abutment connection are strongly related to periodontal biotype.

Topic: Clinical Research: Implant Therapy outcomes

**P0493**

### Retrospective analyses of patients with one or more implant-retained partial fixed dental prostheses

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Toronto/Canada

**Aim:** A retrospective study was initiated at the University of Toronto, Canada, investigating implant-retained crowns and bridges in partially dentate patients. The study methodology is a replica of a study currently underway at the University of Bern, Switzerland. The objective is to contrast the clinical outcomes achieved for patients treated according to different treatment philosophies in the two universities. We present preliminary results for the first cohort of partially dentate patients restored in the University of Toronto clinics.

**Material and Methods:** All patients treated more than 10 years ago with fixed partial dental prostheses retained by Brånemark system implants were invited to participate in the study ( $n=293$ ). Patient satisfaction was evaluated by a questionnaire, and bone loss and various periodontal parameters were assessed by clinical and radiographic examination. The recall history, maintenance requirements, and the incidence rates of biological and technical complications or failures were collected from the patients' institutional or private charts.

**Results:** Fifty-nine patients with 162 implants placed between 10 and 28 years ago have undergone a clinical and radiographic examination at the time of abstract submission. To date, patient satisfaction has been high and bone level loss for the great majority of implants has been less than 1mm. A small minority of implants have demonstrated extensive bone loss.

**Conclusion:** A patient cohort treated in a university between 10 to 28 years ago with implant-retained crowns and partial fixed prostheses reported high satisfaction scores. Bone level loss around the implants was minor, and the incidence rates of biological and technical complications and failures were remarkably low.

Topic: Clinical Research: Implant Therapy outcomes

**P0494**

### Radiographic peri-implant bone loss of zirconia dental implants

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Milan/Italy

**Aim:** The aim of this work is to evaluate peri-implant soft tissue health and radiographic marginal bone loss (MBL) of zirconia dental implants

**Material and Methods:** At the Department of Implantology, University of Milan, from January 2007 to January 2011, 26 mono-component zirconia dental implants (White-Sky®, Bredent, Senden Germany) were used for the rehabilitation of single tooth or partially edentulous ridges. 6 months after surgery, clinical-radiographic evaluation was performed, including periodontal evaluation and radiographic control. The X-ray pictures were processed with a specific software and peri-implant bone levels were measured at the mesial and distal surfaces of each implant. This follow-up-protocol was repeated every 6 months.

**Results:** The mean MBL was  $0,7 \pm 0,57$  mm 6 months after final prosthetic restoration and also 1 year up to 3 years after surgery further MBL was minimal ( $0,129 \pm 0,51$  mm and  $0,046 \pm 0,52$  mm respectively at 2 and 3 years of follow-up). The MBL during the first year of loading was slightly more significant for implants placed in the maxilla ( $0,68 \pm 0,7$  mm) than for those positioned in the mandible ( $0,58 \pm 0,44$  mm). It was observed slightly more peri-implant bone loss for implants placed in the esthetic region ( $0,96 \pm 0,58$  mm) than for those placed in the posterior regions ( $0,29 \pm 0,14$  mm). 18 months after final restoration, the mean values of MBL were  $1,3 \pm 0,6$  mm for single implants and  $0,51 \pm 0,42$  mm for multiple implants. The mean values of visible PI and BOP resulted  $\leq 1$  whereas the mean value of PPD at 36 months was  $3,3 \pm 1,1$  mm.

**Conclusion:** The peri-implant bone preservation may be associated to the absence of microgap between fixture and abutment since zirconia dental implants are one-piece implant. Moreover, zirconia is characterized by high biocompatibility and low plaque adhesion.

Topic: Clinical Research: Implant Therapy outcomes

**P0495**

### Dental rehabilitation after mandibular reconstruction with bone graft by "Double-plate positioning" technique

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Fuzhou, Fujian/China

**Aim:** The goals of reconstruction of mandible are to establish bone continuity with adequate antero-posterior and transverse relationships to the maxilla and to be followed by well location and cosmetic prosthetic appearance of dental implants.

**Material and Methods:** "Double-plate positioning" technique was introduced in our department to provide precise mandible anatomic restoration. Briefly, before the resection of mandible,

two reconstruction plate were pre-bended. The first upper plate followed the margin of alveolar process. Meanwhile, the second lower plate was prebended along the inferior margin of mandible which was used to fix the graft bone after mandible resection. In such, these two plates helped to reserve the height and bucco-lingual orientation of bone defect after resection. After 6 months bone graft, endosseous implants were placed.

**Results:** The successful implant osseointegration and satisfied prosthetic outcome were achieved in all patients who had accepted mandibular reconstruction by "Double-plate positioning" technique.

**Conclusion:** "Double-plate positioning" technique can contribute to the ideal three dimensional position of graft bone for mandibular reconstruction which provides ideal oral rehabilitation by dental implant.

Topic: Clinical Research: Implant Therapy outcomes

**P0497**

### **A prospective pilot study of the use of short implants to obviate the need for sinus augmentation: preliminary results.**

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Graz/Austria

**Aim:** The aim of this prospective pilot study is to evaluate the marginal bone level changes of short implants placed into maxillary sites exhibiting minimal bone height (6-9 mm) requiring sinus augmentation according to standard protocols.

**Material and Methods:** A total of 11 patients (10 female, 1 male) participated in this prospective pilot study. All patients exhibited a preoperative bone height of 6 to 9 mm and were treated in a submerged approach. The implants used in this study were Biomet 3i™ NanoTite™ parallel walled external connected implants (4/7mm and 5/7mm). The preliminary data were collected at insertion (0 months), reentry (3 months) and delivery of restorations (5 months). Additionally a new discomfort index (VAS) was evaluated during the postoperative period.

**Results:** A total of 11 patients (10 female, 1 male) were treated with 22 short implants in the posterior maxilla. The dimensions of the inserted implants were 5/7mm in 8 cases and 4/7mm in 14 cases. The mean bone level at the time of surgery amounted to 0.04mm (min: -1.27mm, max: 0mm, SD: +0.196mm). The respective data were 0.15mm (min: -1.36mm, max: 0mm, SD: +0.4mm) 3 months postoperatively and -0.58mm (min: -2.02mm, max: 0mm, SD; +0.732mm) at the time of restorative treatment (5 months postop).

**Conclusion:** Within the limits of this pilot study placement of short implants can be simpler, cheaper and less invasive without jeopardizing implant integration. Further studies are needed to evaluate the long term success rate of short implants in the atrophic posterior maxilla compared to standard protocols.

Topic: Clinical Research: Implant Therapy outcomes

**P0498**

### **Retrolective Study on implant loss in postmenopausal women under osteoporosis therapy medication**

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**Aim:** Aim of the study was whether oral bisphosphonate therapy (BP) can lead to implant loss or bisphosphonate associated osteonecrosis (BP-ONJ).

**Material and Methods:** Postmenopausal women with medicated osteoporosis were focused and analysed for oral BP (BP-group) and other therapies as systemic/local hormone replacement therapy (HRT), calcium substitution, combination of vitamin D and calcium, vitamin D only, fluoride and selective estrogen receptor modulators (SERM) respectively. All patients with implant placement in a dental surgery office were investigated for implant loss or complications during implant surgery from 2001 to 2007. Medical history was analysed and categorized into two groups: with or without osteoporosis. Statistical evaluation was performed with Kaplan-Meier-survival function.

**Results:** 2116 implants were placed in 818 patients (follow-up: mean: 27 months, SD: 30 months). 275 implants had been placed under osteoporosis therapy (106 patients). Over all 66 implants were lost, 13 under osteoporosis therapy. No implant loss appeared in the BP (N=19) and SERM group (N=13), no complications were observed. 7 implant losses were found in the systemic HRT group, 1 in the local HRT group, 1 under the combined therapy with vitamin D and calcium, 2 losses under vitamin D substitution only and 2 under unknown osteoporosis medication.

**Conclusion:** No BP associated complications or implant losses were found. Most implant losses were observed in the systemic HRT group with estrogen respectively estrogen/gestagen compound. More studies are required to prove the connection between implant placement and BP therapy. The observation on implant losses under systemic hormone substitution deserves further investigation.

Topic: Clinical Research: Implant Therapy outcomes

**P0499**

### **Changes of soft tissue profile following immediate implant placement in maxillary premolar area**

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Naples/Italy

**Aim:** Immediate implant placement into extraction sockets shows several advantages reducing treatment time but failing to prevent tissue dimensional changes following tooth extraction. The aim of this study is to assess soft tissue changes associated with two-piece implants performed with one-stage surgery and placed in fresh extraction sockets of maxillary premolars.

**Material and Methods:** 20 root form implants (Biomet 3i, Palm Beach Gardens, USA) have been placed consecutively in fresh extraction sockets of maxillary premolars in 18 patients and restored with a fixed restoration after 4 months. Peri-implant

tissue healing has been evaluated recording clinical parameters and standardized radiographs at implant placement and after 4, 6, 12 months. Mucosal margin-implant platform distance (MML), horizontal buccal soft tissue profile (HBP), marginal mucosa level, keratinized gingival width, gingival index, and plaque index were assessed at baseline and subsequent clinical controls.

**Results:** The clinical and radiographic success rate of the immediately placed implants was 95% at one-year follow-up. Minimal changes of peri-implant mucosa marginal level were observed over 4 months from the time of implant placement (MML mean difference  $-0.41 \pm 0.32$  mm) ranging between  $-0.87$  mm and  $0.33$  mm. No significant differences were found at 12 months. Buccal soft tissue profile decreased horizontally after surgery showing a HBP mean value of  $1.1 \pm 0.91$  mm at implant placement and  $1.5 \pm 0.95$  mm at 12 months.

**Conclusion:** Two-piece implants performed with one-stage surgery in fresh extraction sockets of maxillary premolars are associated, at 12 months, with minimal clinical changes of soft tissue profile suggesting that this treatment modality may contribute to soft tissue stability.

Topic: Clinical Research: Implant Therapy outcomes

**P0500**

### Comparison of Peri-Implant Parameters and Peri-Implant Crevicular Fluid Levels of Tumor Necrosis Factor- $\alpha$ (Tnf- $\alpha$ ) in Patients with Type-2 Diabetes Mellitus and Systemically Healthy Subjects Following the Dental Implant Placement.

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**Aim:** This study was to evaluate the peri-implant conditions and measure the peri-implant crevicular fluid (PICF) level of TNF- $\alpha$  after implant placement in patients with type 2 Diabetes Mellitus (DM) and systemically healthy subjects (C).

**Material and Methods:** A total of 39 implants were placed to 20 subjects: 27 implants to 13 patients with type 2 DM and 12 implants to 7 patients with C. Clinical measurements were recorded from the implants and teeth sites at baseline, 1st, 4th and 7th months. TNF- $\alpha$  level in PICF was collected at 1st, 4th and 7th months after implant placement and determined by enzyme-linked immunoabsorbent assay (ELISA). Resonance frequency measurements (ISQ) were measured following implant placement at 1st week, 1st and 4th months. Alveolar bone level was evaluated using long cone paralleling technique at 1st week, 4th and 7th months after implant surgery.

**Results:** The width of keratinized gingiva was significantly decreased in DM group at 1st, 4th and 7th months compared to baseline around implant and adjacent teeth to implants. ISQ values were significantly increased in DM at 1st, 4th and 7th months. Alveolar bone level was significantly decreased in DM at 1st, 4th and 7th months compared to baseline and decrease of alveolar bone level in DM from baseline to 7th months was statistically significant between DM and C. TNF- $\alpha$ /concentrate was significantly increased from 1st to 4th months and significantly decreased between 4th and 7th months in DM.

**Conclusion:** These findings showed that if diabetic patients are taken under good glycemic control, implant therapy may be successful.

Topic: Clinical Research: Implant Therapy outcomes

**P0501**

### Long-term results of immediately loaded implants with prefabricated cone connection. Final results

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Frankfurt/Germany

**Aim:** Due to alveolar atrophy in the edentulous lower jaw patients suffer of an insufficient retention by a denture. Therefore this retrospective study examines the concept of the Ankylos SynCone System (Dentsply-Friadent, Germany). The purpose was to investigate the long-term stability of peri-implant bone and soft tissue after immediate loading, such as the objective and subjective retention force of the overdenture.

**Material and Methods:** All patients received four interforaminal implants, immediately loaded, with the Ankylos SynCone® concept. The observation time was from 2005 to 2011. The clinical and radiographic examination was performed on the day of the final prosthetic treatment and annually after. The stability of the peri-implant bone and the soft tissue condition were evaluated. Besides, a questionnaire concerning patient's contentment and further clinical parameters, such as periotest values, periodontal sounding, and radiological bone loss were basis of examination.

**Results:** In this study 33 Patients, 19 woman and 14 men, with an average age of 72.28 years were treated with 132 implants. Four implants were lost, therefore the survival rate was 96.97%. The average time of the implants was 45.1 months (range 12-72 months). At the final recall 98.48% of the implants revealed no vertical and horizontal bone-loss. Furthermore no gingival recession could be recorded. Regarding patient's contentment concerning retention, a rate of 90.91 % could be determined. Considering periotest values and periodontal sounding no relevant deviation was noted.

**Conclusion:** Due to the high success rate and the contentment value of 90.91 % SynCone® can be recommended as a long term concept.

Topic: Clinical Research: Implant Therapy outcomes

**P0502**

### Clinical outcome of dental implants inserted by inexperienced implantologists

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**Aim:** To report the success rate of 182 Ankylos implants inserted by general dentists.

**Material and Methods:** During four consecutive years, an Annual Course of implantology, was offered to general dentists without prior experience in implant therapy. The total number of members was 41. Each member inserted and restored at least 4



implants. A total of 113 patients received 182 Ankylos implants. All implants were installed under closed supervision. 54 implants were placed consecutive to tooth extraction. 22 implants were inserted in combination with Minor Sinus Lift. 9 implants in anterior Maxilla were immediately restored with acrylic non-occluding temporary restoration. Implants length ranged from 8mm to 14mm. Standardized Periapical radiographs, mSBI and mPII, technical complications, were recorded in different time intervals. Patient's satisfaction was also evaluated.

**Results:** 2 implants failed in the same patient before occlusal loading. All other implants became osseointegrated and were restored with definitive restorations. 28 implants were used to rehabilitate 5 edentulous maxillas and 2 edentulous mandibles (4 implants in each jaw) using pre-fabricated SynCone components. 4 implants to restore 2 edentulous mandible with ball-attachment. 64 implants supported bridges for a total of 117 units replaced. 86 implants to replace single tooth. After a total loading period of 26 months (range 12-38) all implants presented a healthy peri-implant soft tissue conditions (mSBI >1; mPII >1) and stable bone level. The success rate was 98,9 %.

**Conclusion:** within the limit of this study, the use of a proper surgical and prosthetic protocol are essential for the success of implant therapy. Clinician without prior experience did not seem to be an influencing variable on implant success.

Topic: Clinical Research: Implant Therapy outcomes

## P0503

### Comparison of Marginal Bone Level Changes of Implants Placed in Non-extraction Sites – A Literature Review

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<sup>1</sup>Kloten/Switzerland, <sup>2</sup>Mahwah/United States of America

**Aim:** To study the reported marginal bone level changes in non-extraction sites over four years of two major implant manufacturers (Astra Tech [AT], Nobel Biocare [NB]) starting from implant insertion.

**Material and Methods:** Clinical articles written in English on dental implants from peer-reviewed journals, listed in MEDLINE, published January 1995 to May 2011 were included. The inclusion criteria were: (i) minimum 10 patients, (ii) all patients followed 1 year or more, (iii) 2-piece implants with a non-machined surface. Only publications with a radiographic baseline at implant insertion (or a maximum of 7 days after this date) were utilized in this analysis. Weighed bone remodeling results were calculated on implant level.

**Results:** The search yielded 12880 publications of which 10 (439 patients, 1543 implants) for AT and 29 (1007 pat., 2394 impl.) for NB met the inclusion criteria. Regarding AT, the reported weighed bone level changes over time were between -0.60mm and -0.27mm at 3 months (284 impl.), 6 months (195 impl.): -0.58mm (min./max.), at 1 year (1543 impl.): -1.5mm to -0.29mm, and at 4 years (329 impl.) -1.60mm to -1.40mm (min./max.). For NB the results were 3 months: -0.95mm to -0.3mm (463 impl.), 6 months: -1.22mm to -0.10mm (636 impl.), 1 year: -1.42mm to -0.27mm (2028 impl.), and 4 years: -1.16mm to -1.06mm (59 impl.).

**Conclusion:** Implant types of both manufacturers showed an initial marginal bone remodelling in the first year and stable levels after the initial remodelling.

Topic: Clinical Research: Implant Therapy outcomes

## P0504

### Peri-implant diseases of implant-supported double-crown retained removable dentures under maintenance care – a practice-based cross sectional study

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**Aim:** Aim was to determine the prevalence of peri-implant diseases in patients with implant-supported, removable double-crown dentures in a dental practice.

**Material and Methods:** Patients with toothless or partially toothless jaws restored with implant-supported, removable, double-crown dentures were included. Inclusion criteria: regular after-care (at least 2x/year), wearing implants and restoration more than 3 years. The dental examination covered: pocket probing depth (PPD), bleeding on probing (BOP), oral hygiene (QHI), and x-ray control. Following details were documented: smoking habit, observation period, implant-type, implant-length, implant-localization, and initial x-ray findings. Statistical analysis: regression model with endpoints: bone loss, mucositis or peri-implantitis and influencing factors: implant-type, denture fastening (tooth mounted or implant-borne), smoking habit, and observation period as co-variables.

**Results:** 77 patients (69.0±10.5 years; f=52, m=25) with 79 dentures on 267 implants and a mean observation period of 8.0±3.7 years were examined. The median QHI was 0. Four implants (1.5%) were lost, 18.4% showed mucositis and 2.6% peri-implantitis. The average bone reduction was 1.6±1.6mm. No influencing factors could be established for the occurrence of mucositis, but smokers had an increased risk (OR: 3.35; CI: 0.82–13.62). For peri-implantitis and bone reduction a significant influence of the parameter smoking was found (p=0.003 and p=0.03), the OR for peri-implantitis was 9.20 (CI: 2.09–40.48).

**Conclusion:** Removable double-crown dentures appear to be well suited for implantological rehabilitation of toothless and partially toothless jaws and, with regular after-care, show a high degree of long-term stability of the peri-implant tissues. Despite regular care, smoking constitutes an increased risk factor for peri-implant diseases.

Topic: Clinical Research: Implant Therapy outcomes

## P0505

### Application of modified splitting technique in dental implantation with severe buccal concavity in maxilla

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**Aim:** To evaluate clinical outcome of a modified splitting technique in dental implantation with severe buccal concavity.

**Material and Methods:** 12 implants were placed into 8 patients with narrow maxilla alveolar ridge (<5mm) and severe buccal concavity as well. All patients were treated with modified splitting technique. After flap surgery, exposing of buccal

wall at edentulous area, bone splitting was performed on apical part of the buccal concavity. A horizontal bone incision was conducted into cortical bone with ultrasonic osteotome or disc saw. Two vertical bone incisions were extended at both mesial and distal of horizontal incision apically. Bone spreading was extended gradually after wedging the bone spreading instrument into cancellous bone from the horizontal incision. Implants were inserted from edentulous alveolar ridge through buccal concavity into the space created by bone spreading. Exposed buccal side of implants were covered with Bio-Oss and Bio-Gide membrane subsequently. Soft tissue incisions were sutured tightly. Prosthetic restoration was accomplished after 3 to 4 months.

**Results:** Osseointegrations were achieved with favourable contour at bone graft area in all 12 implants. Satisfying function and esthetic result of prosthetic restorations were obtained.

**Conclusion:** Advantages of modified splitting technique include: 1. To avoid fracture incidence at buccal concavity area with traditional splitting technique. 2. To guarantee ideal axial orientation of implant. 3. To ensure adequate thickness of buccal and lingual bony wall to support implant.

Topic: Clinical Research: Implant Therapy outcomes

## P0506

### Clinical and radiological outcomes of early loaded implants in smokers versus non-smokers: 1 year results

F. Franch-Chillida, L. Adriaens

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**Aim:** To compare clinical and radiological outcomes of Straumann SLA implants in smokers versus non-smokers loaded before 12 weeks after implant placement.

**Material and Methods:** A total of 15 Straumann implants were placed in 9 patients and followed during 1 year. Nine implants were placed in non-smoking patients and 6 in smokers. All implants were loaded no later than 3 months after implant surgery. Standardized intra-oral radiographs were taken at baseline (implant placement), time of loading and 1 year after loading. Clinical measurements (BOP, PPD, Plaque) were taken the day of prosthesis delivery and 1 year after by a calibrated examiner.

**Results:** None of the 15 implants were lost at the 1 year evaluation. No significant differences were found with respect to presence of plaque (9% vs. 16%), bleeding on probing (16% vs. 11%), mean pocket depth (2,46 +/- 1 mm vs. 2,83 +/- 1 mm) and mean marginal bone loss (0.07 +/- 0.6 mm vs. 0.50 +/- 1.1 mm) between non-smokers and smokers at the 1 year evaluation.

**Conclusion:** The results of this prospective study suggest that Straumann SLA implants in smokers and non-smokers are suitable for early loading protocols in both mandible and maxilla.

Topic: Clinical Research: Implant Therapy outcomes

## P0507

### An evaluation of objective and subjective parameters regarding immediat loading of 4 implants in the premaxilla.

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Ghent/Belgium

**Aim:** The aims of this retrospective study were to describe patient-centered outcomes regarding quality and patients' opinion of full arch bridges placed on Biomet3i implants (Palm Beach Gardens, FL, USA); secondly differences in clinical outcome between nanotite and osseotite implants were measured.

**Material and Methods:** Patients treated over the last 4 years with an immediately placed fixed prosthesis on 4 implants were recalled to score patient's satisfaction and to evaluate the clinical outcome. The implants were immediately loaded with a screw-retained acrylic provisional bridge. After 3 months, definitive bridgework was placed. Trainees or staff members performed the prosthetic treatment. Primary outcome was quality of implant -and prosthetic treatment and patients' opinion. These were assessed by means of validated checklists and OHIP-14 questionnaires. Secondary outcome was implant survival and marginal bone loss, measured from the abutment-implant interface.

**Results:** 11/12 patients attended the examination, hence 44/48 implants were evaluated. The mean satisfaction score was 77%. Patients had never a problem with eating in 90%, with speaking in 81%, with oral hygiene in 78%, with esthetics in 65%, with social contact in 84%. Comfort and well-being was rated perfect in 55 and 75%. No implants were lost. Mean marginal bone level was 2,43 mm(0,73-3,82; SD 0,72) with no statistical difference between Nanotite and Osseotite implants(2,36 vs. 2,50mm).

**Conclusion:** It can be concluded that the majority of patients had no problems with the prosthesis, and all patients would recommend the treatment. There is no significant difference in clinical outcome between osseotite and nanotite implants.

Topic: Clinical Research: Implant Therapy outcomes

## P0508

### OPG and RANKL Levels Around Microscrew Implants During Orthodontic Tooth Movement

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Kayseri/Turkey

**Aim:** The aim of this study was to compare osteoprotegerin (OPG) and receptor activator of nuclear factor  $\kappa$ B ligand (RANKL) levels around loaded microscrew implants with unloaded control implants used as anchorage for tooth movement.

**Material and Methods:** Twenty loaded microscrew implants and sixteen unloaded microscrew implants were included in the study. The mean ages of unloaded and loaded groups were 17.75  $\pm$  0.68 and 18.15  $\pm$  3.06 years, respectively. Microscrew implants were placed between maxillary first and second premolars as anchorage units for distal movement of the maxillary canines. The unloaded microscrew implants served as control group. Peri-

microscrew implant crevicular fluid (MIF) was collected at the beginning (T0), 24 (T1), 48 (T2), and 168 (T3) hours ; and on day 30 (T4). ELISA method was used to measure OPG and RANKL levels in MIF.

**Results:** All of the microscrew implants survived till the end of the study. While total amount of OPG was not different ( $p>0.05$ ) between groups, total amount of RANKL was significantly elevated in loaded implant group ( $p<0.05$ ). MIF volume and OPG concentration were the highest at 48 hours in loaded implant group.

**Conclusion:** During tooth movement, OPG/RANKL ratio in MIF is significantly decreased in loaded implant group as a result of horizontally applied force

Topic: Clinical Research: Implant Therapy outcomes

**P0509**

### Crestal bone remodeling around partial implants

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**Aim:** This paper evaluates crestal bone loss and survival of Nobel Biocare® TiUnite™ Brånemark implants after a 1-4 year follow-up. The results are being reported according to success criteria used in the evaluation of implant systems.

**Material and Methods:** One hundred and twelve Nobel Biocare® TiUnite™ Brånemark implants were placed in 57 patients (32 males and 25 females) from March 2004 until December 2007. The average age was 52 years at the moment of surgery (range 17-71 years). Seven patients were diagnosed as heavy smokers. All patients were periodontally healthy at time of surgery. Radiological bone loss was measured on periapical radiographs and used to determine the success percentage.

**Results:** After 12 months of functional loading 4/112 (3,57%) implants were lost. The average crestal bone loss was 1,07 mm (SD = 0,58 mm; interval 0 - 2,15 mm). After 52 months 0,97 mm (SD = 0,47 mm; interval 0 - 2 mm) bone loss was noted. 83,5% of the individual implants were considered succesful based on bone loss values after an average follow-up of 30 months.

**Conclusion:** These results show that Brånemark implants with a TiUnite™ surface and a single-stage surgical technique can lead to a good and predictable result in all indications.

Topic: Clinical Research: Implant Therapy outcomes

**P0510**

### Comparison of complication in sinus elevation surgery using ultrasonic osteotome and conventional equipments

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**Aim:** To compare the difference of complication between sinus elevation surgery using ultrasonic osteotome and conventional equipments.

**Material and Methods:** 28 external sinus lifts with simultaneous implant placement were performed in 25 patients. Distance between maxillary alveolar ridge and sinus floor were 2-6mm confirmed with panoramic radiograph. The operation was carried out similarly in all patients according to routine approach except the step of exposing sinus membrane. Ultrasonic osteotome was used for exposing sinus membrane in 16 cases, whereas conventional round bur or ball point was used in other 12 cases. The buccal wall of sinus cavity was replaced in ultrasonic osteotome group, and on the contrary, was removed in traditional equipment group. The bony cavity around implant was filled with Bio-Oss and covered by Bio-Gide membrane. Complications such as sinus membrane perforation during surgery, post operation hemorrhage, swelling and wound healing were observed.

**Results:** Two sinus membrane perforation and one post operation hemorrhage were observed in ultrasonic osteotome group. One sinus membrane perforation and one post operation hemorrhage were noticed in conventional equipment group. No significant difference of post operation swelling was observed between two groups. Prosthesis restoration was completed 4-6 months after implantation. No loosening or loss of implant was found after 1-2 years of restoration

**Conclusion:** There is no significant difference between application of ultrasonic or conventional equipment in external sinus lift concerning of technical difficulty, post-operation complication and success rate of implantation.

Topic: Clinical Research: Implant Therapy outcomes

**P0511**

### Periimplant tissue stability around modified Sand-blasted Large-grid Acid-etched (SLActive) implant surface in augmented bone

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**Aim:** The aim of this retrospective study was to evaluate the safety and efficacy of implants with modified Sand-blasted Large-grid Acid-etched (SLActive) surface, inserted into augmented alveolar ridges.

**Material and Methods:** 17 patients were included presenting a total of 30 implants. Sites were treated with simultaneous or staged augmentation in 8 and 9 cases, respectively. 29 implants were integrated and successfully loaded with fixed partial dentures. At the time of loading, and 6 and 12 months later clinical parameters were recorded: bleeding on probing (BOP), periimplant probing depth (PPD), mucosal recession (MR), implant mobility, presence of inflammation or suppuration and patients' complaints. To assess crestal bone changes, intraoral radiographs were taken at baseline, 6 and 12 months post loading. Distance between implant shoulder and crestal bone was measured on digitized images at mesial and distal aspects of fixtures. Digital images were examined under 8-fold magnification. Implant height was used for calibration.

**Results:** One implant failed before loading. All loaded implants survived and were successful according to criteria by Albrektsson et al. BOP averaged 5,1%, 6,8%, 4,3%; PPD averaged 3,12±0,45mm, 3,24±0,36mm, 3,41±0,52mm; MR averaged 0,34±0,26mm, 0,46±0,22mm, 0,49±0,61mm; marginal bone loss averaged 0,73±0,29mm, 0,78±0,31mm, 0,98±0,5mm at loading, 6 and 12 months post loading, respectively. No implant showed periimplant inflammation.

**Conclusion:** Our results confirm that SLActive implants present high survival and success rates in augmented bone. Follow-up marginal bone loss and clinical parameters were comparable to implants inserted to pristine sites.

Topic: Clinical Research: Implant Therapy outcomes

## P0512

### The three-dimensional implant planning. Proposal of a surgical protocol

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Marseille/France

**Aim:** The three-dimensional (3D) implant planning with NobelGuide™ (NG) protocol recurred high precision and has shown us that any error in the protocol resulted in an unusable prosthesis. The purpose of this study was to identify possible errors and reduce their number by limiting the indications of original NobelGuide™ (ONG) and by modifying the surgical protocol (modified NobelGuide™ - MNG).

**Material and Methods:** Four years retrospective study of ONG (103 implants) and 2 years retrospective study of MNG (119 implants) were done on 30 cases (222 implants) of total edentulous. In MNG, the early phases remain the same like ONG, but we modified the surgical protocol and the implants placements were done in 2 phases (Branemark technique). We realized a protocol to study the physical properties of surgical guide.

**Results:** The registered results of the 14 cases treated with the ONG show that we encountered many difficulties, but only one failure. Given the physical constraints we cannot exclude a slight deformation of the surgical guide who may cause errors in the implants positions and so the impossibilities to fix the prosthesis. We have tested the MNG in 16 cases with 100% success.

**Conclusion:** The complications implied with ONG made us change the surgical protocol, that why we choose now MNG which combines the Branemark's surgical technique ("gold standard") and technological advances in 3D implant planning. Our study leads us to the conclusion that the MNG, while simplifying the protocols for the patients, makes easier and more confident our approach to difficult cases.

Topic: Clinical Research: Implant Therapy outcomes

## P0513

### Periodontal pathogens in patients treated with dental implants

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**Aim:** Aim of this study was to compare presence of periodontal pathogens around teeth and implants in patients treated with dental implants using a commercially available PCR test

**Material and Methods:** 25 patients were treated with 50 implants, mean time since implantation 24.5 ± 12.27 months. Bacteria tested were: Aa, Pg, Pi, Tf and Td, clinical indices were recorded

**Results:** Presence of bacteria around teeth and implants was: 68.8% and 75% for Aa, 82% and 87% for Pg, 31% and 25% for Pi, 88% and 94% for Tf and 87% and 68% for Td. Strong correlation was found between presence of bacteria around teeth and implants ( $p < 0.01$ ). No difference was found in clinical indices between teeth and implants. Very strong correlation was found between time since implant placement and presence of Aa and Td, and weaker correlation for Pi and Tf.

**Conclusion:** Similar periodontal pathogens can be found around teeth and implants in patients treated with dental implants, which indicates that periodontal infection needs to be addressed before planning implant therapy, especially in periodontitis susceptible patients

Topic: Clinical Research: Implant Therapy outcomes

## P0514

### Dynamics of soft tissue healing around implants and teeth after flap surgery. A study in a dog model.

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**Aim:** The aim of this study was to describe and to compare some characteristics of the soft tissue healing process around teeth and implants after flap surgery.

**Material and Methods:** Five beagle dogs had their mandible third and fourth premolars extracted in both quadrants. After three months, two titanium fixtures (Osseospeed™) were installed and abutments were connected at each side of the mandible. After 3 months, four regions characterized by one implant and the adjacent tooth were identified in each dog. One region was randomly selected and soft tissue resective flap surgery was performed at its buccal aspect. The lingual soft tissues were not elevated and were regarded as control sites. The remaining three regions were randomly treated in an identical manner and the dogs were sacrificed to provide biopsies representing healing intervals of 1, 2, 4 and 12 weeks. The biopsies were prepared for histological and morphological analyses. Mean values and standard deviation was calculated using the dog as a statistical unit. Student's t test was used ( $p < 0.05$ )

**Results:** Morphometric and histometric analyses have shown that the hard and soft tissues surrounding teeth were completely healed in 4-week interval. However, it took from 4 to 12 weeks for the peri-implant mucosa to heal completely.

**Conclusion:** The healing process around teeth and implants follows a similar sequence of events. Nevertheless, the complete process of healing and maturation of the peri-implant tissues takes longer than around teeth.



Topic: Clinical Research: Implant Therapy outcomes

## P0515

### Early Implant placement in socket preservations: 12-month results of a prospective case series.

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<sup>1</sup>Liege/Belgium, <sup>2</sup>Liège/Belgium

**Aim:** The aim of this study was to evaluate the clinical and histological outcomes of implant placed after socket preservation procedures in the esthetic zone. Implant survival rate and biological complications were recorded during a follow-up period of 1 year.

**Material and Methods:** 12 patients needing the replacement of one tooth in the esthetic zone were included in the present study. The hopeless teeth were extracted atraumatically, the sockets were filled with bovine hydroxyapatite (0.25-1mm particles) and the sites were covered with a saddled connective tissue graft. After a healing period of 3 months, biopsies were retrieved in the socket preservation sites and implants were placed. The patients were followed for a period of 1 year.

**Results:** A total of 12 implants were placed on 12 patients aged from 24 to 61. All implant reached an adequate primary stability (at least 20N/cm2). After a follow-up period of 1 year, all implants fulfilled strict success criteria for dental implants and no further complications occurred. Out of 12 sites only 7 biopsies were retrieved for histological analyses. New bone was found in the apical third of the socket in every specimen, in the mid-third in only 3 specimen and no bone was found in any of the specimen in the more cervical third of the socket.

**Conclusion:** The results from this prospective case series suggest that early implant placement in extraction socket site seems to display good clinical outcomes despite the incomplete bone regeneration in the socket at 3 months.

Topic: Clinical research: Implants in compromised sites

## P0516

### Soft dilatation, a new concept of expansion of atrophied alveolar ridge: A one-year follow-up report of a multicenter study.

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**Aim:** The purpose of this multicenter study is to evaluate the effectiveness of a progressive expansion technique for implant placements in narrow ridges.

**Material and Methods:** A total of 337 sites in 244 patients, 70 males and 174 females, aged 18 to 84 years with alveolar ridge resorption were treated with an original surgical expansion device (Soft Dilating System Arslane Lugano Switzerland) for bone expansion at time of implant placements. The implants were restored 3 months after the surgery. The follow-up period after prosthetic loading was one year.

**Results:** All the 337 sites, with a minimum bone width of 2.5mm, could receive simultaneous implant, 10 implants failed to osseointegrate and were removed or lost before prosthetic restoration, giving a 97.0% success rate for osseointegration. New implants were placed after a 3-month healing period and were successfully integrated at the 3-month control. At the end, all sites in all patients could be rehabilitated with implant-supported prosthesis. No implant failure occurred after prosthetic rehabilitation, giving a 100% survival rate at the end of the follow-up period.

**Conclusion:** Within the limits of this study, this simple technique allows placing implants in narrow ridges and appeared to be reliable. It reduces the morbidity and treatment time when compared with bone augmentation techniques performed before implants placements. Survival rates of implants placed with this new technique were equivalent to those of implants placed in native bone. Longer time of control is necessary to confirm these early results.

Topic: Clinical research: Implants in compromised sites

## P0517

### Single procedure for post-extractive placement and immediate loading of laser engineered titanium surface implants

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Parma/Italy

**Aim:** Implant supported rehabilitation is typically a long lasting therapy. Recent literature provides evidence of success with shortened protocols in single tooth replacement either by insertion of implant in fresh extraction socket or by immediate, non-functional load. Evidence can also be found for the combination of these clinical procedures.

A clinical trial of 33 etched and sandblasted titanium surface implants with a follow-up from 12 to 52 months and a success rate of 96.97% was performed in our department and published in 2006.

aim of this clinical trial is to find if the same results can be achieved using a new implant with a laser engineered titanium surface .

**Material and Methods:** Ten consecutive patients were treated using the same protocols of the previous study. Laser engineered surface implant was placed (Way Milano, Geass, Italy). Temporary abutment was screwed in and a temporary acrylic crown immediately adapted to non-functional loading. All procedures were performed in the same day. After 4 months, a porcelain-fused to metal crown was cemented to a custom-made titanium abutment. Follow-up visits were recorded from 12 to 18 months after definitive crowns were positioned.

**Results:** Clinical results are similar to those presented in the previous study . After 4 months all implants were osteo-integrated, no bone loss and no gingival recession were detected around implants. These results were confirmed at follow-up visits after definitive crowns placing.

**Conclusion:** In a short follow-up period laser micro engineered surface implants can achieve same results in immediate provi-sionalization of post-extractive implants as etched sandblasted titanium surface implants.

## Topic: Clinical research: Implants in compromised sites

**P0518****Implants placement in periodontally compromised patients**

A.M. Pais, D. Alves, F. Almeida, F. Negrão

Carvalhos/Portugal

**Aim:** The placement of implants in periodontally compromised patients is not a contraindication, if strict control of the bacterial plaque is made. Periodontal disease is a risk indicator for peri-implantitis, mainly because they share the same etiology and clinical characteristics, and have common risk factors such as poor oral hygiene, smoking and diabetes.

**Material and Methods:** A case of periodontally compromised patient with multiple gingival recessions. There is no regenerative periodontal treatment which can replace the missing bone and gum on 31 and 44, for this reason, the treatment plan consisted of extraction of teeth 33 to 44, placement of four implants NobelBiocare Tapered Groovy® and a fixed provisional prosthesis screwed on the same day; impressions and placement of a metal-ceramic fixed prosthesis 3 months later. No implants were placed on the 44 and 31 areas as it would mean bone regeneration procedures, which, in periodontal patients, have a low success rate.

**Results:** This is a case with thin gingival biotype, so it is important to place the implants 3 mm below the gingival margin to prevent recession which can be seen in these cases.

**Conclusion:** The survival rate of implants placed in periodontally compromised patients does not differ statistically from those placed in periodontally healthy patients. Most studies report implant survival rates above 90%, with follow-up from 3 to 16 years.

## Topic: Clinical research: Implants in compromised sites

**P0519****Study on peri-implant hard and soft tissue with Branemark implants placed angulated**M. Stelzel<sup>1</sup>, S.B. Buchholz<sup>2</sup><sup>1</sup>Krems/Austria, <sup>2</sup>Erlangen/Germany

**Aim:** The objective of this clinical study was to compare the marginal peri-implant hard and soft tissue situation of conventional axial with angulated implants.

**Material and Methods:** Patients with axial and angulated Bränemark dental implants with the TiUnite™ surface were examined retrospectively. One implant per patient was chosen randomly to avoid intra-individual correlations and subsequent misleading statistical information. In addition to the usual criterion of peri-implant bone loss, probing depths, oral hygiene and inflammation were evaluated by modified plaque index (mPI), modified gingival index (mGI) and bleeding on probing (BOP).

**Results:** The total patient group comprised 62 patients with 295 implants, 238 were placed in an axial position and 57 in an angulated position. Due to the statistical selection from 61 patients, 31 axial implants (average follow-up period of  $4.1 \pm 1.1$

years) and 30 angulated implants (average follow-up period of  $2.4 \pm 1.1$  years) both in the pre-/molar section, were evaluated. Regarding the success criterion of peri-implant bone loss of SMITH and ZARB (1989), angulated implants compared to axial implants showed a cumulative success rate (CSR) of 90 % to 97 %. The difference was not significant. Regarding all other parameters no differences was observed.

**Conclusion:** Angulated implants are a reliable method to avoid augmentations. With regard to the evaluated parameters no difference to axial implants could be ascertained.

## Topic: Clinical research: Implants in compromised sites

**P0520****Flapless Dental Implant Surgery For Patients On Oral Anticoagulants - "WarLess Procedure"**

H.A. Alzoman, S. Al Mubarak

Riyadh/Saudi Arabia

**Aim:** The purpose of these case reports is to show the clinical predictability of dental implant placement using a minimally invasive flapless approach without reducing the dosage of anticoagulants for patients on lifelong anticoagulant therapy

**Material and Methods:** A 45 year old woman and 58 year old male patient who had undergone cardiac surgery and currently under full therapeutic level of anticoagulation therapy (warfarin) were treated with flapless dental implant surgery without reducing their anticoagulant dosage.

**Results:** Post-operative clinical and radiographic assessment showed no abnormality, minimal signs of inflammation and excellent healing

**Conclusion:** The combination of minimally invasive flapless dental implant surgery without interrupting the normal dose of the anticoagulant medications could be an improved method to place dental implants in patients on long term anticoagulant therapy

## Topic: Clinical research: Implants in compromised sites

**P0521****Implant placement and limited vestibulo-oral dimensions. A radiographical retrospective study.**

J.A.J. Keestra, J. Merheb, M. Quirynen, A. Temmerman

Leuven/Belgium

**Aim:** To date, there is insufficient evidence to set a threshold for the minimal amount of bone necessary in vestibulo-oral dimensions for implant placement. This follow-up study aims to radiologically evaluate the interproximal bone changes (up to 1-year after functional loading) for implants placed in bone with limited dimensions.

**Material and Methods:** 19 subjects (mean age 65 years, 5% male, 95% female), who required partial bridges, full bridges and/or overdentures, and who presented with a narrow alveolar crest were pre-operatively scanned (cone-beam CT or multi-slice CT). Implant sites with  $\leq 4.5$  mm of vestibulo-oral bone dimensions

for implant placement were included. A total of 57 implants (7% mandible; 93% maxilla) were installed with a two-stage procedure. 5% were placed with GBR procedures (because of a fenestration or dehiscence). All implants were placed subcrestally (mean 1.2mm; SD: 0.62). The mean insertion torque for these implants was 35Ncm with a mean ISQ value at insertion of 66 ISQ. The mean period for osseointegration before functional loading was 3.6 months. Intra-oral, long-cone radiographs were taken at implant insertion, at abutment connection and after 1 year of functional loading. The analysis of peri-implant bone level alterations was performed by 2 calibrated, independent periodontologists. Results were re-evaluated when there was 1mm inter-examiner difference.

**Results:** None of the implants failed up to the 1-year follow-up (overall cumulative survival rate after 1 year of loading = 100% on implant level). The mean loss of bone during the months of submucosal healing and integration period, was 1.22 mm (SD= 1.03). The loss of marginal bone at the implants during the first year of functional loading (including the remodelling phase) was 0.57 mm (SD= 0.88).

**Conclusion:** Based on the present data and within the limitations of this study, we can conclude that in implant sites with  $\leq 4.5$ mm vestibulo-oral dimensions, it's possible to place implants with a survival and success rate, after 1 year in function, similar to implants placed in less demanding (wider bone) alveolar crests.

Topic: Clinical research: Implants in compromised sites

## P0523

### Implant placement with bifid mandibular nerve: case reports

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**Aim:** Inferior alveolar nerve injury is one of the most serious complications in implant dentistry. The knowledge of the anatomy and surgical procedures is essential for the prevention of lesions and complications. There are some anatomical variations in the population that could affect our treatment plan. One of them is the bifid inferior alveolar nerve. The aim of this poster is to report two clinical cases with an occasional radiological finding of bifid mandibular nerve and treatment plan with short implants.

**Material and Methods:** Two patients visited our clinic to replace posterior mandibular teeth. A cone beam computed tomography (CBCT) was performed as routine protocol in our university clinic with the iCat 3D Dental Imaging (Imaging Sciences International, Hatfield, PA. USA). In both clinical cases we have diagnosed bilateral bifid inferior alveolar nerve in patients with absences of teeth 3.6 and 4.6. After this occasional finding, treatment of the edentulous ridges was performed with short implants, with no further complications.

**Results:** The review of the literature reveals an occurrence of bifid canal of 0.08% - 0.95% in panoramic radiographs, although in 25% - 39% of cases is not visible. When CBCT was used, 65% of bifid canals were identified. Due to the wide anatomical variation of the mandibular canal and its important clinical implications it is recommended to include CBCT or conventional CT in the diagnostic protocol before implant placement to avoid surgical complications.

**Conclusion:** Preoperative CBCT study is essential for posterior mandibular rehabilitation with dental implants in order to accurately describe the course of the mandibular nerve and avoid possible complications.

Topic: Clinical research: Implants in compromised sites

## P0524

### Role of vestibuloplasty in the treatment of periimplantitis: a report of 3 cases

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Budapest/Hungary

**Aim:** The aim of this retrospective case report of 3 cases, presenting a total of 5 implants was to evaluate the effectiveness of a modified vestibuloplasty technique to create stable soft tissue conditions around ailing dental implants exhibiting compromised soft tissue conditions.

**Material and Methods:** 3 patients exhibiting moderate periimplant bone loss, bleeding on probing (BOP) increased probing depths (PD) and lack of buccal attached periimplant mucosa were treated. Mechanical debridement and chemical disinfection of periimplant pockets were performed prior to surgery. After 3 months healing time a modified vestibuloplasty procedure was used to reestablish previously lost attached mucosa, with simultaneous deepening of the vestibule around implants. Following local anaesthesia, an apically oriented paramarginal bevelled incision was placed 3mm from the mucosal margin. A split thickness flap was elevated, and subsequently fixed with resorbable sutures (Coated Vicryl 6/0, Ethicon, East Brunswick NJ, USA) to the underlying periosteum, 3-5 mm apically from the incision line. The uncovered periosteal layer was left to heal by secondary epithelialisation. Periodontal dressing was used to cover the wound, if necessary, sutures were removed after 14 days.

**Results:** 3-5 mm gain of non-inflammatory attached mucosa was observed around treated implants. BOP and PD were reduced at each implant, reestablished mucogingival conditions were more conducive for oral hygiene.

**Conclusion:** The presented minimally invasive modified vestibuloplasty reestablished attached periimplant mucosa, which may improve the soft tissue environment around ailing implants. The present surgical approach may also serve for creating more appropriate soft tissue conditions for further periimplant hard tissue reconstructions.

Topic: Clinical research: Implants in compromised sites

## P0525

### Analysis of microbiota associated with peri-implantitis

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Tokyo/Japan

**Aim:** Peri-implantitis is an inflammatory disease that leads to the destruction of soft and hard tissues around osseointegrated implants. The subgingival microbiota appears to be responsible for peri-implant lesions. Although the presence of periodontopathic bacteria has been reported in peri-implantitis, characteris-

tics of microbiota in peri-implantitis is still unclear. The purpose of this study was to identify the microbiota in subjects who have peri-implantitis and periodontitis affected teeth using 16S rRNA gene clone library analysis and real-time polymerase chain reaction (PCR) to clarify the microbial differences.

**Material and Methods:** Six subjects with peri-implantitis and a periodontally diseased tooth were selected. They had not received systemic antibiotics, anti-inflammatory drugs or oral antimicrobial agents within the last 3 months. Subgingival plaque samples were taken from the deepest pockets using sterile paper points. Prevalence and identity of bacteria was analyzed using a 16S rRNA gene clone library technique and real-time PCR.

**Results:** Each clone was classified into several clusters corresponding to phylum-level classification. Microbiota in peri-implantitis mainly included Gram-negative species. The species of *Parvimonas micra*, *Peptostreptococcus stomatis*, *Pseudoramibacter alactolyticus*, and *Solobacterium moorei* were only detected peri-implantitis sites. *Fusobacterium nucleatum* and *Streptococcus mitis* were observed at both peri-implantitis and periodontitis sites. Richness estimation showed that clone library of peri-implantitis contain significantly higher 16S rRNA gene diversity than that of periodontitis. Similarly, the Shannon index was significantly higher in peri-implantitis than in periodontitis.

**Conclusion:** The biofilm in peri-implantitis showed a more complex microbiota when compared to periodontitis. Several bacteria were identified as candidate pathogens in peri-implantitis.

Topic: Clinical research: Implants in compromised sites

## P0526

### Radiographic Evaluation of the Mental Canal as a Reference Structure for Planning Dental Implants by Cone-Beam CT

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Vienna/Austria

**Aim:** Panoramic radiographs provide only the 2-dimensional projection of the mental foramen (MF) as critical structure in planning dental implants. The 3-dimensional slices of the mental canal (MC) on Cone-Beam Computer Tomography (CBCT) show that the vertical course down to the mandibular canal opens access for an implant lingual to the MF. The incorporation of the bone associated to the MC would result in a more effective and patient-oriented planning of dental implants.

**Material and Methods:** The goal of this retrospective study was to evaluate the dimensions of the mandible relative to the MC as reference structure. 100 paracoronal slices were scanned by CBCT and evaluated by I-CAT Vision. Measurement error analysis was accomplished after a period of 2 weeks.

**Results:** The median vertical bone dimension from the crestal corticalis to the MC was 11.60mm (0.5–7.2mm). This is an average gain of 3.2mm vertical bone in comparison with vertical measurements to the MF. Using the MC as reference, 28% more vertical bone was detected than with the MF as reference. Thus an additional vertical bone volume of 3.0–5.0mm was measured in 52%. The horizontal bone volume between the origin of the MC and the lingual cortical margin was 6.4mm (2.8–10.8mm).

In 48% a horizontal bone dimension of 6.0–8.0mm was found lingual to the origin of the MC.

**Conclusion:** The study demonstrates that the analysis of the MC by 3-dimensional radiographic devices detects an additional implantologically relevant vertical and horizontal bone volume compared to measurements with the MF as reference structure.

Topic: Clinical research: Implants in compromised sites

## P0527

### Implant site development using forced tooth eruption in esthetic maxillary zone: a case report.

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**Aim:** One of the most important factors in the successful placement of implants is the presence of adequate alveolar bone at the recipient site. Alveolar bone loss, mostly associated with destructive periodontal disease results in hard and soft tissue deficiency that may compromise subsequent implant placement. Typically, such defects are treated prior to or at the time of implant surgery by guided bone regeneration. However, such defects may be managed non-surgically by orthodontic extrusion.

**Material and Methods:** A 22-year-old woman was referred to Istanbul Univ. Dept. of Periodontology with mobility class 3 on tooth 11, abscess formation and fistula. It was decided to extract the tooth and place an implant. Firstly, SCTG has performed to increase the width of keratinized gingiva. After the flap was raised the severe bone deficiency both interproximally and buccally was observed. 2 months later it was decided to perform hard tissue augmentation. 3 months after eruption immediate implant placement has been performed. 4 months later the provisional and after 6 months the final restorations were placed.

**Results:** The most widely used grafting procedures for that kind of deficiencies are onlay block grafting or GBR. But these methods are unpredictable in vertical augmentation. So it was decided to gain vertical bone height and volume via orthodontic forced tooth eruption. 4–5 mm of gain in bone height both interproximally and buccally has been observed.

**Conclusion:** Orthodontic extrusion can be used to increase the vertical bone height and volume and to establish a more favourable soft-tissue profile prior to implant placement.

Topic: Clinical research: Implants in compromised sites

## P0528

### Hard Tissue Profile of Anterior Maxillary Region: A Restrospective Study in An Asian Population

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Singapore/Singapore

**Aim:** The aim of this study was to investigate the hard tissue profile of the anterior maxillary region in a group of



periodontally healthy patients aged 21 years and above treated in an institutional practice (National Dental Centre Singapore, NDCS).

**Material and Methods:** Periodontally healthy Asian patients who received various treatments at NDCS including orthodontic and oral surgery for removal of mandibular 3rd molars from August 2008 to September 2009 were identified from the CBCT database and their record folders were retrieved and evaluated. 187 patients were shortlisted and upon review, 100 patients met the inclusion criteria. Information regarding buccal bone dimensions at 4 different levels (crest, 2mm apical to crest, mid root & root apex) of anterior maxillary teeth was collected using CBCT images (viewed eXamVision software) and entered into an Excel spreadsheet. Descriptive statistics were done using Microsoft Office Excel 2007, including means and standard deviation of buccal bone thickness at 4 different levels. Data regarding the buccal bone thickness were categorized into (i) <1mm, (ii) 1 to 2mm & (iii) >2mm.

**Results:** Mean width of buccal bone in the anterior maxilla was  $0.88\text{mm} \pm 0.34\text{mm}$  at crest,  $1.11\text{mm} \pm 0.45\text{mm}$  2mm apical to crest,  $0.84\text{mm} \pm 0.35\text{mm}$  at mid root &  $1.46\text{mm} \pm 0.79\text{mm}$  at root apex. 99.5%, 95.9%, 98.1% & 76.2% of sites at crest, 2mm apical to crest, mid root and root apex were <2mm in thickness.

**Conclusion:** The need for guided bone regeneration is very high for both delayed and immediate placement of dental implants due to the dimensions of the anterior maxillary alveolar bone in Asian population.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

## P0529

### A innovative gingival retraction technique for esthetic restorations in implant dentistry: a case series

V. Bennani

Dunedin/New Zealand

**Aim:** Dental implants are fast becoming the preferred restoration for permanent tooth replacement. To achieve a more predictable aesthetic outcome cemented-retained prosthesis are often used. In order to accurately fabricate these cement-retained restorations, gingival retraction is needed before impressions are taken. This clinical case series presents a new gingival retraction technique for implant impression taking when the restorations are in the esthetic zone. Optimal gingival retraction should be achieved to insure good impression outcomes. Since the gingival apparatus around implant is weaker than the periodontal tissue the use of atraumatic gingival retraction technics is recommended to insure that the newly formed junctional epithelium surrounding the customised abutment is preserved after impression making, providing optimal and stable soft tissue contours around the restoration. The packing pressure generated by an injectable matrix is 10 times lower than the cord system therefore the risk of injury to the peri-implant tissues is reduced. Recently cordless retraction paste material for gingival retraction in implant dentistry has become of interest to the clinician. Though several clinical cases it is proposed that the use of this atraumatic gingival retraction technique is key for achieving long-term aesthetics in implant dentistry.

**Material and Methods:** CASE REPORT: Several clinical cases are presented to illustrate an innovative atraumatic gingival retraction technique for esthetic implant restorations. This new technics insures that the newly formed junctional epithelium surrounding the customised abutment is preserved after impression making, providing optimal and stable soft tissue contours around the restoration.

**Results:** DISCUSSION: Optimal gingival retraction should be achieved to insure good impression outcomes. The packing pressure generated by an injectable matrix is 10 times lower than the cord system therefore the risk of injury to the peri-implant tissues is reduced. Recently cordless retraction paste material for gingival retraction in implant dentistry has become of interest to the clinician.

**Conclusion:** Though several clinical cases it is proposed that the use of this atraumatic gingival retraction technique is key for achieving long-term aesthetics in implant dentistry.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

## P0530

### The pediculated connective tissue graft for periimplant site development in the esthetic zone

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Rijeka/Croatia

**Aim:** Introduction Missing teeth are involved with the atrophy of the buccal alveolar bone. The teeth to be extracted are often accompanied by bone and/or soft tissue defects. In most cases, an implant can be placed in the correct position with or without bone augmentation procedure. Nevertheless, the soft tissue often remains an esthetic concern due to a discrepancy in facial mucosa level and curvature, absent or incomplete papillae, missing root prominence, and, particularly, due to the bluish gingival color and tissue texture without stippling.

**Material and Methods:** Case report The clinical cases present the vascularized interpositional periosteal-connective tissue flap technique for periimplant site development in the aesthetic area prior to implant placement and at the time of implant placement.

**Results:** Diskussion Connected via a pedicle to the palate, the vascularized graft maintains its own blood supply, with almost no volume loss postoperatively. The graft remains vital even when covering poorly vascularized recipient sites like bone blocks, membranes or implant covering screws. It can be used for periimplant site development prior to implant placement or at the time of implant placement with concomitant bone grafting to achieve adequate soft tissue volume with one surgical intervention, avoiding extensive undermining of the adjacent soft tissue.

**Conclusion:** Conclusion These case presentations demonstrate that the use of a pediculated connective tissue graft may be an effective way to achieve an excellent aesthetic outcome in implant surgery concerning all parameters included within PES.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

**P0531**

**Immediate load implant after the extraction of a superior lateral incisor.**

M. Kruczan

*Rio De Janeiro/Brazil*

**Aim:** The technique of immediate load implants make procedures simpler, reducing healing time, costs and providing more comfort to the patient and replacing natural teeth loss by correcting masticatory function and aesthetics.

**Material and Methods:** A female patient of caucasian origin, non-smoker, 70 years old, in good overall health. Clinical examination showed a fistula in the 12 element. X-ray showed a periapical lesion in spite of an endodontic retreatment. After C.T. and occlusal study the tooth was extracted, the alveolus cleaned and an immediate implant, manufactured in Brazil, of 4.3 x 16 mm was loaded and a temporary prosthesis was placed. Azithromycin 500mg once a day for 5 days was prescribed. The patient returned 4 weeks later and a zircon crown was placed.

**Results:** Controls after 6 months and 1 year were done demonstrating an excellent integration with bone and soft tissues.

**Conclusion:** Tooth extraction and immediate loading implants should be done as soon as possible while respecting the protocols required by the technique, minimizing bone reabsorption, demonstrating it to be a technique more and more used in dental implants due to its predictability and safety.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

**P0532**

**Immediate implant restoration in the anterior region of the upper jaw; a case report**

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*Istanbul/Turkey*

**Aim:** Introduction

Implant placement in a postextraction site in the esthetic zone is a challenge for clinicians, since esthetic expectations of patients are high and potential esthetic complications can be devastating especially for patients with preexisting soft and hard tissue deficiencies. The aim of this clinical report was to present a protocol for a multidisciplinary to provide an immediate implant restoration in the esthetic zone.

**Material and Methods:** Case report

The clinical report describes immediate implantation and restoration in the esthetic zone of a patient with severe chronic periodontitis. The teeth were extracted with minimal hard and soft tissue trauma and without flap reflection. Non-invasive surgical approach was used to prepare the socket and insert tapered implants. The implants were immediately restored with provisional abutments and crowns without occlusal contacts.

During the provisional restoration, no significant soft tissue contraction was related to non-invasive operating technique and the immediate insertion of the provisional restoration. The patient exhibited no clinical or radiologic complications through 10 months of clinical monitoring after restoration.

**Results:** Discussion: The esthetic and functional success of implant restoration in the anterior maxilla requires careful clinical evaluation and planning. A multidisciplinary approach is particularly important, especially for implant patients with additional tissue loss.

**Conclusion:** The 10 months of postoperative follow-up revealed that the implants were stable and harmonious soft tissue margin was achieved in the esthetic zone. Radiographs demonstrated a normal vertical osseous height and excellent osseointegration of the implants.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

**P0533**

**Periointegration A new concept for papilla preservation**

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*Madrid/Spain*

**Aim:** Achieving papilla anatomy between adjacent implants in the esthetic zone presents an important challenge in implant dentistry.

**Material and Methods:** Three patients were treated with immediate implants in the anterior maxilla. Previously, a vacuum splint was prepared in a custom model. Splint was adapted immediately after surgical procedure and provisional restoration were completed. Patients were advised to use the splint all day for three weeks.

**Results:** Natural suction, induced by patient swallow and speech, generated in the vacuum splint's hole a gingival growth that filled the space, creating a pseudopapilla with a very natural appearance.

**Conclusion:** By means of a simple procedure, all three cases have been aesthetically resolved with acceptable results and few complications for patients

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

**P0534**

**The coverage using connective tissue graft for abutment exposure after Implant installation at the maxillary anterior area**

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*Gwang-Ju/Korea*

**Aim:** When the implant placed on anterior area, the abutment with high level of exposure frequency was observed during and after the surgery, at the time of following up, due to thin labial bone thickness. Several literatures mentioned existence of minimum 2mm labial bone led to stable results during implant installation. There are many

methods of covering abutment. Among them, the connective tissue graft shows stability at several literatures. the purpose of this study is to find out effective treatment of the exposed abutment after implant installation through 2 cases.

**Material and Methods:** Chief complaint of 27 years-old woman patient placed a implant after #21 tooth extraction due to trauma was labial abutment exposure. She took treatment at this hospital because labial abutment exposure recurred regardless of operating a series of CTG at the local clinic. CTG conducted to biotype of thin gingiva and labial position of implant after obtained sufficient space for placing graft by eliminating certain quantity of ceramic abutment. Another was about 30 years old woman with a esthetic issue by labial position of an implant. #11 abutment exposure and covered by using semilunar technique.

**Results:** The former case could meet with more stable results than CTG, as the general method, because procedures carried after obtaining sufficient space by changing implant abutment. The latter case brought a satisfactory result by using semiluna technique.

**Conclusion:** CTG after obtaining sufficient space by changing abutment as well as typical coverage of the exposed abutment using CTG produced effective coverage on around abutment exposed area around abutment.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

P0535

### Oral Rehabilitation of a severe type A Hemophilic patient with chronic Hepatitis type C and HIV infection with Implants

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Sevilla/Spain

**Aim:** Only one article have been published in the scientific literature describing implant placement in patients with clotting disorders such as hemophilia, this is the first communication, were in addition the patient had a state of immunosuppression.

**Material and Methods:** The patient a 46-year-old man, endured severe hemophilia A, HIV infection A2 stage, chronic hepatitis C genotype 1A and hypertension. In the oral examination two mandibular edentulous section were observed, to replace by an implant-supported prostheses. Once radiological study was conducted, consultation with his hematologist was necessary. Drug therapy consist on tranexamic acid 1 g/6 hours during 5 or 7 days. Postoperatively, antibiotic and analgesic treatment were given as 875 mg/125 mg of amoxicillin clavulanic three times daily for 7 days and 500 mg of paracetamol three times daily for 3 or 4 days. After surgery the patient was interned in the hospital and received 2.000 units of factor VIII concentrate 10 hours after surgery and 3.000 units 24 hours later. Surgical treatment were performed under local anesthesia. In the right mandibular section were placed three Straumann Standard Plus Regular Neck implants Å 4.1 mm - length 10 mm and in the left mandibular section two implants of same characteristics

**Results:** The patient did not show postoperative complications. During the 3 months following the collocation of implants, the patient came to periodic reviews. After this period of osseointegration, two fixed bridges were placed.

**Conclusion:** Although in this case the treatment proved successful, we need long-term prospective studies to evaluate the implant success rate in these patients.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

P0536

### Dental implant placement in patients with cemento-osseous dysplasias: case reports.

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**Aim:** Cemento-osseous dysplasias are an uncommon radiopaque cementum-like masses that characteristically affects the jaws. The diagnosis is always made radiologically and histopathologically. In terms of oral rehabilitation with implants, the avascular nature of that lesions might complicate the osseointegration of the implants. The objective of this poster is to report two clinical cases with an specific radiological findings of radiopaque cementum-like masses and treatment plan with dental implants.

**Material and Methods:** Two middle-aged women were visited in our clinic to replace posterior teeth. A cone beam computed tomography (CBCT) was performed with the iCat 3D Dental Imaging (Imaging Sciences International, Hatfield, PA. USA) and also a periapical and panoramic radiographs as routine protocol. Both cases presented dense bone images compatible with cemento-osseous dysplasia. The histopathologic findings revealed formation of calcified dense sclerotic masses diagnosed as cementoblastomas. In both cases the edentulous areas were treated successfully with dental implants without any complications in a follow-up period of 12 months.

**Results:** The review of the literature showed that no treatment is necessary when the lesions are asymptomatic, small and benign. However, there was not any specific or extensive documentation regarding dental implant success rate and cemento-osseous lesions.

**Conclusion:** Preoperative panoramic and periapical radiographs as well as conventional CT scan or CBCT study and histopathologic analysis are essential for implant treatment in edentulous areas with presence of cement-osseous dysplasias.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

P0537

### Cone Beam CT evaluation of presence and course of the incisive canal in the mandibular interforaminal region in a group of Turkish Patient

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Mersin/Turkey

**Aim:** The objective of the present study was to evaluate the presence and course of the incisive canal in the mental interforaminal region and to describe the occurrence of anatomical variations using cone beam computed tomography (CBCT).

**Material and Methods:** CBCT examinations of 484 sites of 242 patients (133 female, 109 male patients, age range was 17-83, mean 36,7 years) were evaluated retrospectively. CBCT images were taken for various purposes such as pre-implant imaging, Le Fort I osteomy, or orthodontic purposes with a Newtom 3G machine (QR Verona s.r.l., Verona, Italy). CBCT images were reconstructed as axial, sagittal, cross-sectional and panoramic images. The course and the length of the canal were measured by means of the machine's software

**Results:** The incisive canal was found in 91% of the scans and the mean endpoint was approximately 12,4 mm anterior to the mental foramen. The mean distance from the lower border of the mandible was 10.5 mm and its course was closer to the buccal border of the mandible in 82% of the scans. The lingual foramen was definitely visible in 85% of the scans.

**Conclusion:** Mandibular incisive canal seems to be occurred higher rate using CBCT than previous studies. CBCT is extremely useful in detecting these canals with less ionizing radiation with capability of 3D imaging.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

**P0538**

### ACTINOMYCES AND BISPHOSPHONATES: A CASE REPORT

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**Aim:** INTRODUCTION Nowadays postoperative avascular osteonecrosis in patients with history of oral bisphosphonate consumption is a very uncommon but severe complication on implant therapy. Its etiology remains unknown but long-term usage of oral bisphosphonates and microbial sobreinfection are well known risk factors

**Material and Methods:** CASE REPORT A 68 year old woman seek for dental rehabilitation at the Clinic of the European University of Madrid. On her medical history she mentioned that she had Osteoporosis, and was in treatment with monthly oral Bisphosphonates. The upper left incisor was extracted before placing the implants. 2 weeks later an exofitic lesion appeared from the dental socket. It was reddish and painful. Bone kidnap was assessed by x-ray examination so that we decided to make an excisional biopsy. The histopathological analyses revealed the presence of Actinomyces. The patient was treated with Clindamycin 300 mg every 8 hours for 10 days with complete remission of the infection. 3 months later, the patient had an implant surgery done without any complication.

**Results:** DISCUSSION Postoperative osteonecrosis in patients taking bisphosphonates have been widely investigated. Oversuppression of cellular turnover may be the main factor on the development of avascular osteonecrosis, but there are other factors such as microbial contamination that must be investigated. The presence of any complication after a dental extraction is not necessarily related with the fact of suffering from the same complication after implant therapy.

**Conclusion:** Since Actinomyces could play an important role in the pathogenesis of bisphosphonate related osteonecrosis more studies must be carried out.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

**P0539**

### Block grafting approach: a case report

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Casablanca/Morocco

**Aim:** Soft and hard tissue defects create an anatomically less favorable foundation for ideal implant placement. Reconstruction of the alveolar bone through a variety of regenerative surgical procedures has become predictable. It may be necessary prior to implant placement or simultaneously at the time of implant surgery, to provide a restoration with a good long term prognosis.

**Material and Methods:** In a case report, we will show autogenous block graft approach, on a 21 years man, for horizontal bone augmentation, and we will describe the augmentation outcomes.

**Results:** A variety of onlay bone graft techniques has been used for severely resorbed ridges. The success of the reconstructive procedures is influenced by the span of the edentulous ridge and the amount of attachment on the neighboring teeth. Although, autologous onlay bone graft techniques have been considered as gold standard, for horizontal augmentation. (Matsumoto et coll 2002). Donor sites morbidity associated with block grafts has turned attention to the use of allogenic graft materials.

**Conclusion:** Many different techniques exist for effective bone augmentation. Further comparative studies are warranted to evaluate the best approaches.

Topic: Clinical tips and cases: prosthodontic treatment

**P0541**

### Digital planning, guided surgery and immediate loading: the key for success

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**Aim:** The accurate and predictable placement of implants according to a computer generated virtual treatment plan is now a reality, taking the virtual plan from the computer to the patient clinically. Recent advances in three dimensional imaging dentistry in combination with immediately loading protocols lead to a better patient care and outcomes.

**Material and Methods:** A full arch rehabilitation is digitally planned with eight implants and an immediate loading under a complete guided surgery protocol in a 43 year old patient. A provisional fixed prosthesis and a surgical stent were previously fabricated for the implant surgery with the help of a digital planning software. A scanner was performed with a radiological stent that repositioned the waxed structures in the ideal final position.

**Results:** Flapless procedures have been reported to reduce postoperative swelling and patient discomfort. Avoidance of mucoperiosteal flap should prevent the potential postoperative bone resorption associated with full thickness periosteal flap procedures. Immediate loading of full-arch mandibular fixed prosthesis is an accepted clinical procedure.



Based on the digital treatment planning, the positions of the implants are planned and the final treatment plan consists of predetermined precise position for the implants that correspond to the desired rehabilitation. The immediate prosthesis may be fabricated prior to the implant surgery.

**Conclusion:** Computerized navigation for flapless implant surgery can enhance this surgical procedure. The accurate positioning of implants according to the digital plan enables the confectioning of provisional prostheses before the surgery. Patient satisfaction and treatment predictability increase notoriously in digital planning procedures.

Topic: Clinical tips and cases: prosthodontic treatment

## P0542

### First clinical experience with 'crown abutments' for single tooth restorations

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**Aim:** The need to replace a missing single tooth with an implant is a common restorative procedure. An implant-supported restoration is screw-retained or cemented. A screw-retained restoration can be either fixed directly to the implant or to an intervening full-metal abutment. The other option is to cement a restoration to an abutment. The clinical experience demonstrates that retained cement around these abutments is a common occurrence that can be an injurious etiologic agent affecting soft and hard tissues. To avoid these cement related problems, CAD/CAM zirconia crown abutments are available. In the soft tissue area these abutments have a high quality surface of an industrial made component. The margin for the individual veneering with dental ceramic is on the soft tissue level and this ceramic material is directly coated to the zirconia abutment.

**Material and Methods:** 15 crown abutments for the replacement for molars, bicuspid and one lateral upper incisive. Before the fixation of the screws all proximal contact point were checked. Access wholes were closed with composites using the right shade. The crown abutment is directly screwed to the implant.

**Results:** Due to the fact that there was no surplus of cement to be removed, the soft tissue showed no irritation. There were no signs of inflammation over a period of 6 month. All crown abutments could be placed without mechanical problems.

**Conclusion:** Due to the fact, that there is no need for any kind of cement, crown abutments are an ideal way for single crown restorations on implants with a perfect axial position.

Topic: Clinical tips and cases: prosthodontic treatment

## P0544

### Implant Restoration and Occlusal reconstruction of a Severe Dental Attrition Case

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Fuzhou/China

**Aim:** Male patient, 63 years old. Chief complain: Left posterior maxilla dentition is absent with loosening implant prosthetic in

right maxilla. Examination: 17, 25, 26, 27 missing. 13—24 PFM bridge supported by 13, 12, 22, 24. 16—14 distal cantilever (16) PFM bridge which supported by tooth (14) and implant (15) severely loosened. 14 root fractured with post fell off, 15 buccal side of implant collar and abutment retaining screw fractured. Lower dentition is complete, while 36—46 are severely attrited and occlusal surfaces are buccal-obliqued. Interarch distance is decreased which shows deep overbite in intercusp position. Facial vertical dimension in intercusp position decreased with drooping angulus oris line.

**Material and Methods:** Treatment protocols: Surgical phase: Place 3 implants in site 16, 25, 27; Extract 14, immediate implant placement. Retain the intraosseous part of the implant (15), and grind the part above the bone surface. RCT all mandible teeth. Occlusal reconstruction: Increase the intrarch distance by a maxillary RPD. Prosthetic phase: 3 months later, restore 16—14 & 25—27 with PFM bridges. make single PFM crowns for 46 to 37 rehabilitating the normal height, shape and occlusal curve of lower dentition.

**Results:** The buccal-obliqued occlusal surfaces of mandible teeth leads to over strong buccal side component of force which caused fracture of natural tooth and implant.

**Conclusion:** Abnormal occlusal condition is the key factor leading to over strong buccal component of force and the subsequent fracture of natural tooth and implant. The complication can hardly be avoided if we didn't noticed that. Treatment protocol should base on the analysis of multiple complex information gained from overall examinations.

Topic: Clinical tips and cases: prosthodontic treatment

## P0545

### Dental rehabilitation of the reconstructed neo-mandible following recurrent intra-osseous carcinoma of the mandible

I.R. Blum, P.H.R. Wilson, C. Hughes

Bristol/United Kingdom

**Aim:** Introduction: Endosseous implants have revolutionized prosthetic dental rehabilitation following resective cancer surgery in the head and neck area.

**Material and Methods:** Case report: This case report details a 65-year-old female patient who initially underwent unilateral resection as treatment for squamous cell carcinoma of the right mandible. Pre-implant assessment of the remaining mandible using cone beam computed tomography revealed a recurrent carcinoma in the left mandible which led to further resective surgery, followed by reconstruction with a microvascular free fibula flap secured between the angles of the mandible. Following the placement of four dental implants, as the primary means of dental rehabilitation, and a four month healing period an implant-level impression was taken and a dressing plate was constructed. A palatal keratinized soft tissue graft procedure was undertaken and the graft was fixed in position around the implants with the dressing plate secured with screws to the implants. Following a two week healing period, the dressing plate was removed, revealing healthy peri-implant soft tissues. Dental rehabilitation involved the construction of a CAD-CAM milled titanium bar and an overdenture. The patient has been wearing her prosthesis satisfactorily for over one year and reported a significantly improved health-related quality of life (HRQOL).

**Results:** Discussion: The presented technique results in predictable functional hard and soft tissue reconstruction and improved HRQOL in patients undergoing extensive resection of the mandible.

**Conclusion:** The presented technique is an elegant approach to restore the mandibular arch, oral functions, facial aesthetics and significantly improve quality of life in patients with reconstructed mandibles.

Topic: Clinical tips and cases: prosthodontic treatment

## P0546

### New pre-fabricated bar system for implant supported rehabilitation in severe osteoporotic patients before intravenous bisphosphonates administration.

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Lausanne/Switzerland

**Aim:** Introduction: The present report presents two loading protocols for implants placed in the anterior mandible and prosthetic rehabilitation using a new pre-fabricated bar system SFI-Bar (Cendres et Metaux, Biel/Bienne, Switzerland) in patients suffering of severe osteoporosis and needing urgent administration of intravenous bisphosphonates (IV-BP).

**Material and Methods:** Case report: Two implants (n=4) (SLA, Straumann, Switzerland) were placed in the anterior mandible of two partially edentulous female patients suffering from severe osteoporosis using a non submerged protocol. The implants were functionally loaded after 2 and 10 weeks of healing according to the instructions of the SFI Bar manufacturer. At 9 months of placement, no prosthetic complication has been reported and no implants were lost, only slight variations in marginal bone level occurred until the end of the observation period.

**Results:** Discussion: Patients undergoing perfusion of IV-BP require well stable and fitting dentures as poor adapted dentures are considered a risk factor for bisphosphonates related osteonecrosis of the jaw due to mechanical trauma of the mucosa. The new pre-fabricated SFI-Bar is a chairside simplified solution that eliminates several laboratory steps of conventional bar attachment rehabilitation. From patient's perspective, a loaded implant supported overdenture is delivered for function on short time span after surgery with less clinical work, is reducing costs and might improve quality of life.

**Conclusion:** This new passive fit pre-fabricated bar system seems to provide fast, safe and might be a reliable solution for implant rehabilitation in the mandible of patients requiring urgent treatments.

Topic: Clinical tips and cases: prosthodontic treatment

## P0547

### Maxillary overdenture – A Clinical Case

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Viseu/Portugal

**Aim:** While the conventional denture may meet the needs of many patients, others require more retention, stability, function and

esthetics. Implant-supported overdentures offer many practical advantages over conventional complete dentures and removable partial dentures. These include decreased bone resorption; reduced or eliminated prosthesis movement; better esthetics; improved tooth position; better occlusion, including improved occlusal load direction, increased occlusal function and maintenance of the occlusal vertical dimension. In addition, implant-supported overdentures improve phonetics, the patient's psychological outlook and quality of life. Conventional implant fixed prosthesis may not be possible in certain cases namely in patients of low incomes. In such cases, an overdenture can be made and connected to osseointegrated implants.

Implant overdenture treatment for the edentulous maxilla is challenging due to inherent anatomic and biomechanical problems. Moreover, controversy persists as to factors critical for implant and prosthetic success.

**Material and Methods:** A 56 year old toothless male patient with bilateral maxillary sinus pneumatization rehabilitated with placement of four dental implants and three months later a maxillary overdenture.

**Results:** Studies show implant-supported overdentures have superior retention when compared to conventional dentures. It is a predictable treatment alternative to both conventional dentures and complete fixed implant supported denture.

**Conclusion:** Regardless of the type of attachment system used - bar, ball or magnet - patients are significantly more satisfied with implant-supported overdentures than with conventional dentures.

Topic: Basic Research: Aetiology and Pathogenesis

## P0548

### The influence of physical effort on the concentration of calcium and magnesium in mixed resting saliva

M. Radwan-Oczko, Z. Kozłowski  
Wrocław/Poland

**Aim:** Calcium and magnesium are among the most common and important elements in the human body. They are present in saliva, although their role and potential impact on the oral environment are not fully understood. The aim of the study was to assess the impact of physical effort during progressive test for calcium and magnesium concentration in mixed resting saliva collected before and after exercise.

**Material and Methods:** Study group consisted of 74 athletes and the control group of 43 men - not practising sport professionally. Calcium and magnesium concentrations were determined photometrically in supernatant of resting mixed saliva

**Results:** In athletes group mean calcium concentration was 3.65 mg / dl before exercise and increased after exercise to 6.20 mg / dl. In the control group mean Ca concentration was 3.84 mg / dl and did not differ significantly in comparison to the results of athletes. The mean concentration of magnesium in the study group before exercise was 0.54 mg / dl and was significantly lower compared to the mean concentration of 0.71 mg / dl after the progressive test. In the control group average magnesium concentration was significantly lower compared to values in the study group before and after the physical progressive test. Significant reduction in salivary flow rate under the influence of the effort from an average of 0.33 to 0.29 ml / min was observed.

**Conclusion:** Physical effort increased however not significantly the concentration of calcium. At the same time and the concentration of magnesium in mixed resting saliva increased significantly

Topic: Basic Research: Aetiology and Pathogenesis

**P0549**

### Salivary oxidative stress biomarkers for periodontal disease

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Bucharest/Romania

**Aim:** To determine the antioxidant capacity of saliva in PD. Abstract. Saliva has been used within the past 10 years for identification, monitoring and prediction of various diseases including oral diseases. It contains proteins, electrolytes, hormones, other molecules derived from the blood and antioxidants. Antioxidants are one of the defense mechanism against oxidative stress (OS). OS represents the imbalance between production of highly reactive molecular species (reactive oxygen species and reactive nitrogen species [ROS, RNS]) and antioxidant defense systems. Tissue injury due to free radical production and ROS has been demonstrated to be enhanced in individuals with PD due to a lack of adequate antioxidant defense.

**Material and Methods:** Antioxidant activity of saliva was compared in 20 healthy individuals and 20 patients with PD in a sample of whole unstimulated saliva. Periodontal disease status was characterized using the Community Periodontal Index of Treatment Needs (CPITN) system. The following salivary biomarkers were evaluated: uric acid, albumin, gamma glutamyl transpherase (GGT) and total antioxidant capacity (TAC). They were tested using analysis kit on automatic analyzer. Analysis kits were provided by Biosystems Diagnostics (Spain) and by Randox (UK).

**Results:** Our study revealed statistically decreased levels of all mentioned parameters in patient's saliva versus controls.

**Conclusion:** The result of our study suggest that a significant OS occurs in the case of patients with PD. Uric acid, albumin, TAC and GGT are very important and promising salivary biomarkers for monitoring the oral OS.

Topic: Basic Research: Aetiology and Pathogenesis

**P0550**

### THE EFFECT OF SUPRA- AND SUBPHYSIOLOGICAL TESTOSTERONE LEVELS ON LIGATURE-INDUCED BONE LOSS IN RATS – A RADIOGRAPHIC AND HISTOLOGICAL STUDY

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Araraquara/Brazil

**Aim:** Testosterone is the primary male sexual hormone, and varying concentrations of the hormone mediated by physiological, pathological or pharmacological mechanisms may induce large variations in the body. The general role of testosterone in the

periodontium and in mediating inflammation has not been established. Therefore, the purpose of this study was to assess the consequences of supra- and subphysiological levels of testosterone on ligature-induced bone loss in rats **Material and Methods:** Three rats were used to observe the course of serum testosterone concentration following orchiectomy and testosterone injection. Sixty rats were randomly assigned to one of the following groups (n=10/group): sham-operation controls, sham-operation and ligature-induced bone loss (Sham+L), orchiectomy without ligature (Ocx), Ocx and ligature (Ocx+L), Ocx plus 250 mg/kg body weight intramuscular testosterone esters injection without ligature (Ocx+T) and Ocx, T and ligature (Ocx+T+L). The ligatures were placed 30 days post-orchiectomy (or sham-operation) and maintained for 15 days. The rats were sacrificed, and their hemi-mandibles were used for radiographic evaluation of bone loss along with histologic and histometric analyses of gingival tissue.

**Results:** The results indicated a significant increase in bone loss in the Ocx and Ocx+T groups in the presence and absence of inflammation, respectively. In addition, the Ocx and Ocx+T groups presented increased gingival area accompanying ligature-induced bone loss.

**Conclusion:** Both sub- and supraphysiological testosterone levels may influence bone metabolism, but only subphysiological levels significantly increase ligature-induced bone loss. Moreover, testosterone has a regulatory effect on the gingival area.

Topic: Basic Research: Aetiology and Pathogenesis

**P0551**

### Ghrelin Levels in Chronic Periodontitis Patients

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**Aim:** In this study, it was aimed to evaluate plasma ghrelin levels in chronic periodontitis patients and to investigate if any relationship exists between ghrelin and periodontal parameters, serum cytokines and bone turnover markers.

**Material and Methods:** Thirty five systemically healthy and chronic periodontitis patients (CP) and 35 systemically and periodontal healthy individuals (C) were included in this study. Plaque index, gingival index (GI), bleeding on probing, probing depth and clinical attachment levels were recorded. Blood samples were obtained to determine levels of total and acylated ghrelin, interleukin-1 $\beta$  (IL-1 $\beta$ ), tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), soluble receptor activator nuclear factor kappaB ligand (sRANKL), alkaline phosphatase (ALP) and osteocalcin (OSC).

**Results:** Plasma levels of total and acylated ghrelin were significantly elevated in the CP group compared to the C group (p<0.05). Such difference was significant only between male groups as groups were compared in respect to gender (p<0.05). As there were no differences between groups regarding serum sRANKL, TNF- $\alpha$  and ALP, an increase in IL-1 $\beta$  and a decrease in OSC level of CP group was observed (p<0.05). Beside, positive correlations between total ghrelin and ALP, total ghrelin and acylated ghrelin were determined. There was not any correlation between ghrelin levels and periodontal parameters.

**Conclusion:** Our results indicates an increase of plasma total and acylated ghrelin levels in existence of CP. Researches with large populations where ghrelin levels in gingiva, gingival crevicular fluid and saliva are determined in order to evaluate the role of ghrelin and its' different forms in periodontal disease are needed.

## Topic: Basic Research: Aetiology and Pathogenesis

## P0552

**The influence of wear of manual toothbrushes on gingival injuries - an in-vitro study using pig palate**

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Goettingen/Germany

**Aim:** Aim was to determine whether wear and hardness of manual toothbrushes (TB) can influence injuries to the gums.

**Material and Methods:** 18 soft (Group A) and 18 medium hard TB (Group B) (both Dr. Best-Plus, GSK) were divided into three subgroups (n=6): new (A1, B1), 3 months (A2, B2), and 6 months of use (A3, B3). Wear was created by standardized simulated brushing. Pig palates were used as material (size 5x10cm). The single cleaning simulation was carried out in a brushing machine with 240 strokes and 2.5N pressure. The palates were embedded in paraffin, and stained in 0.3µm sections (HE-staining). The histological evaluation was carried out using a light microscope (Axioskop, Zeiss) with 9 sections per toothbrush-gum region. To provide an assessment of gingival injuries, a scale of 0 to 5 was used. Statistical analysis: non-parametric ANOVA (p<0,05).

**Results:** Although all TBs belonging to Groups A and B did not differ significantly (p=0.6116), the difference related to the degree of wear was significant in both groups (p=0.0009). A significant difference between A1 (4.67±0.95; median: 5) / B1 (4.14±1.38; median: 5), A2 (2.99±1.62; median: 3) / B2 (3.3±1.83; median: 4) (p=0.0003), and A2 / B2 and A3 (4.23±1.29; median: 5) / B3 (4.0±1.0; median: 5) (p=0.0085) was found. The difference between A1 / B1 and A3 / B3 was not significant (p=0.2016).

**Conclusion:** The results reveal that a new TB and a TB after 6 months of use showed a significant influence on the degree of injury. The hardness of the bristles had no effect.

## Topic: Basic Research: Aetiology and Pathogenesis

## P0553

**Mouse fibroblasts guide IL-23 induction by Porphyromonas gingivalis-stimulated Dendritic Cells in gingipain-dependent manner.**

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**Aim:** In a previous study, we reported that bradykinin release in BALB/c subgingival tissues exposed to *P.gingivalis* induces IL17-producing and INF-γ producing T cells in gingipain-dependent manner (Monteiro et al., J.Immunol., 2009). Here, we sought to determine whether (i) bone marrow derived DCs exposed to *P.gingivalis* (W83) versus gingipain-deficient mutants (KRAB) differentially produce IL-23, i.e., a key Th17-polarizing cytokines (ii) gingival fibroblasts (GF) may modulate the response profile of immature DCs (IL-23 and CCR7) in gingipain-dependent manner.

**Material and Methods:** Mouse BMDCs were co-cultured with mouse GFs and stimulated with *P. gingivalis* LPS (0.1 µg/mL), *P. gingivalis* (strain W83) or a triple gingipain knockout *P. gingivalis* (KRAB) for 24 h. Subsequently, the supernatants were collected and IL-23 levels were quantified by ELISA whereas CCR7 expression by CD11c+ DCs was determined by FACS.

**Results:** Our results indicate that bacteria-exposed GF/DCs led to a pronounced enhancement of IL-23 responses by the CD11c+ DCs partner, as compared to (i) cultures containing only DCs (ii) GF/DC co-cultures exposed to the KRAB mutant. Furthermore, CCR7 expression, likewise dependent on gingipain, was upregulated independently of co-culturing with GF.

**Conclusion:** Our results suggest that GFs condition the functional responses of immature DCs, shifting *P.gingivalis*-evoked maturation responses towards the IL-23 innate pathway. Ongoing studies should determine the role of GF versus DCs on the gingipain/bradykinin B2 receptor pathway leading to Th17 polarization in BALB/c mice infected by *P.gingivalis*.

## Topic: Basic Research: Aetiology and Pathogenesis

## P0554

**Evaluation of the relation between volatile sulfur compounds and periodontal inflamed surface area in patients with chronic periodontitis. A cross-sectional study.**

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Santiago/Chile

**Aim:** To explore if volatile sulfur compounds (VSC) levels are correlated with the periodontal inflamed surface area (PISA) in patients with chronic periodontitis.

**Material and Methods:** A cross-sectional study was conducted with 71 patients. After underwent full-mouth periodontal exam, probing depth (PD) and bleeding on probing (BOP) were recorded. From these data PISA was calculated. Additionally, the VSC levels were recorded with a sulfur monitor (Halimeter®, Interscan Corp, USA). Data was analyzed, using STATA 11.2, with Spearman correlation test and a linear regression for the relation between the logarithm of the VSC levels and the squared of PISA.

**Results:** The median and the interquartile range for VSC levels, BOP, gingival index (GI) and PISA were 74 and 103 ppb; 60.1 and 31.8 %; 1.46 and 0.38; 945 and 686.7mm<sup>2</sup> respectively. An increase in VSC levels was correlated with an increase in BOP (0.43 with a p-value < 0.01) and GI (0.30 p-value < 0.05). The coefficient and R<sup>2</sup> of linear regression between the logarithm of the VSC levels and the squared of PISA was 5.8 (p-value<0.0001) and 0.19 respectively.

**Conclusion:** Patients with chronic periodontitis and larger periodontal inflamed surface area have higher VSC levels. This data can suggest that VSC levels in patients with chronic periodontitis can influence in the severity of the periodontal disease measure with PISA.



Topic: Basic Research: Aetiology and Pathogenesis

## P0555

### Influence of a cyclooxygenase-2 selective inhibitor on alveolar bone density: a histometric study in rats.

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**Aim:** The aim of this study was to evaluate, histometrically, the influence of a selective COX-2 non-steroidal antiinflammatory agent, meloxicam, on interradicular bone density in rats

**Material and Methods:** The experiment was conducted with 49 adult male Wistar rats, divided randomly into 4 groups which received daily subcutaneous injection in the following treatments: rats in groups 1A and 1B received the volume of 1 ml / kg 0.9% NaCl for 15 days and 45 days, respectively, as controls animals and animals in groups 2A and 2B received 3mg/kg of meloxicam, in the same periods. Alveolar bone density of interradicular area was histometrically measured for each group utilizing an imaging program, Image J. Data were statistically analyzed by two-way ANOVA test ( $\alpha=5\%$ ).

**Results:** The results of histometric assessment didn't demonstrate any statistically interaction between time and treatment ( $p>0.05$ ). Difference was not also observed when antiinflammatory was administered ( $p>0.05$ ), however, increased bone density was observed in both groups of 45 days ( $91.45 \pm 3.14$ ;  $92.38 \pm 2.26\%$ ) ( $p<0.05$ ).

**Conclusion:** These results suggest that the meloxicam administration, during 15 and 45 days, did not influence on interradicular mineral bone density and no interaction was observed with the time.

Topic: Basic Research: Aetiology and Pathogenesis

## P0556

### Green tea catechin suppresses LPS-induced periodontal pocket formation and alveolar bone resorption

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Nagasaki/Japan

**Aim:** Green tea catechin (GTC) has been reported to exert a variety of biological effects including anti-bacterial and anti-inflammatory activities. Periodontitis is an inflammatory disease caused by oral biofilm microorganisms. However, there has been no report about the effect of GTC via gingival sulcus on periodontitis. In the present study, we used LPS-induced rat periodontitis model to examine whether GTC has an inhibitory effect on periodontal pocket formation and alveolar bone resorption, the findings which are characteristic in periodontitis.

**Material and Methods:** Rats received intraperitoneal injections of *E.coli* LPS followed by a booster injection of LPS after 28 days. From the one day after the booster injection, the LPS group was topically applied with LPS into the palatal gingival sulcus every 24 hours. The GTC group was received LPS mixed with GTC. Peripheral blood was collected at baseline, 24 hr after the 5th, 10th and 20th topical applications. At baseline and After 10th, 20th application rats were killed. Loss of attachment, bone destruction and inflammatory cell infiltration were histopathologically and histometrically investigated. RANKL-bearing cell was immunohistologically evaluated. Serum anti-LPS antibody level was determined with ELISA.

**Results:** There was no significant difference in the serum levels of the anti-LPS IgG in both groups. However, loss of attachment, bone destruction, inflammatory cell infiltration and RANKL expression in the GTC group were significantly decreased compared with those in the LPS group.

**Conclusion:** These findings demonstrated that GTC suppresses periodontal pocket formation and alveolar bone resorption.

Topic: Basic Research: Aetiology and Pathogenesis

## P0557

### Sonicated extracts and Lys-gingipains of *Porphyromonas gingivalis* regulate the RANKL-OPG expression in human periodontal cells

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Beijing/China

**Aim:** The receptor activator of NF-kappa B ligand (RANKL) and its decoy receptor, osteoprotegerin (OPG) are the important proteins in osteoclastogenesis. In this study we investigated the effects of sonicated extracts and recombinant Lys-gingipains of *Porphyromonas gingivalis* (*P. gingivalis*) on RANKL - OPG expression in human periodontal ligament cells (hPDLCs) in vitro.

**Material and Methods:** The 5~6th passage of hPDLCs, which were obtained by the tissue culture, were inoculated by the  $5 \times 10^4$ /ml density in 25ml culture flask: hPDLCs were exposed to 25, 50µg/ml sonicated extracts of *P. gingivalis* which are substitution of *P. gingivalis* and 25, 50µg/ml Lys-gingipains for 6h, hPDLCs in negative group were without them. The expression of RANKL/OPG mRNA and protein were examined by real time PCR and Western blotting. OPG protein in the supernatant was examined by ELISA.

**Results:** PCR and Western blotting revealed that the RANKL mRNA and protein were up-regulated by application of 25, 50µg/ml sonicated extracts of *P. gingivalis* and Lys-gingipains. In contrast, OPG mRNA and protein were down-regulated by sonicated extracts and Lys-gingipains. Sonicated extracts of *P. gingivalis* and Lys-gingipains resulted in an increased RANKL/OPG expression ratio.

**Conclusion:** The results indicate that *P. gingivalis* up-regulates the RANKL/OPG expression ratio in hPDLCs maybe by Lys-gingipains, breaking the balance of bone metabolism.

## Topic: Basic Research: Aetiology and Pathogenesis

## P0558

**Is the Polymerase Chain Reaction Reliable and Sufficient Method for Species-Specific Identification of Periodontopathogens?**

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Belgrade/Serbia

**Aim:** The aim of this study was to isolate and identify *A. actinomycetemcomitans* in the subgingival biofilm of subjects with periodontitis in Serbian population.

**Material and Methods:** Patients diagnosed with severe chronic periodontitis were enrolled into the study (n=22). Pooled samples of subgingival plaque were grown on solid medium for culture-based identification of microorganisms. Colonies suspected to be *A. actinomycetemcomitans* based on their morphology were selected for molecular identification using conventional PCR technique and 16S rRNA gene sequencing.

**Results:** Thirty four colonies were selected as potential *A. actinomycetemcomitans* and subjected to species-specific genotyping and 16S rRNA gene sequencing. Using PCR method with earlier published '*A. actinomycetemcomitans* -specific' primers the product of expected size was detected in all subjects. However, after 16S rRNA gene sequencing, the selected species were identified as *Campylobacter rectus*, *Capnocytophaga* sp, *Aggregatibacter segnis* and *Aggregatibacter aphrophylus*. Surprisingly, *A. actinomycetemcomitans* was isolated and confirmed in only one patient.

**Conclusion:** PCR based identification of *A. actinomycetemcomitans* was earlier suggested to be accurate and rapid method, especially when used directly on samples from subgingival plaque. The presented results show that, although sensitive, conventional PCR method is not conclusive per se and should be used in combination with other molecular techniques such as 16S RNA gene sequencing for precise microbiological diagnosis and monitoring of patients with periodontal disease.

## Topic: Basic Research: Aetiology and Pathogenesis

## P0559

**Expressions of Tumor Necrosis Factor-Related Apoptosis-Inducing Ligand (TRAIL) in human gingival epithelial cell line and its receptors in gingival tissues**

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**Aim:** TRAIL is a homotrimeric type II transmembrane protein that belongs to the TNF superfamily. TRAIL not only induces apoptosis of the cells expressing certain receptors, but also has an important role in the regulation of inflammation and immune response. The aim of this study is to determine the effect of *Porphyromonas gingivalis* on the TRAIL expression in human gingival epithelial cell line (epi4) and the localization of its receptor in human gingival tissue.

**Material and Methods:** The epi4 cells were cultured in the presence or absence of *P. gingivalis* strain ATCC33277 and its gingipain-null mutant, KDP-136. Real-time PCR was conducted to measure TRAIL gene expression in epi4 cells. In order to examine whether TRAIL play roles in the gingival tissues, the expression of the death receptor (TRAIL-R1) and decoy receptors (DcR-1 and DcR-2) were analyzed by immunohistochemistry using the paraffin sections prepared from gingival tissue of either periodontitis or gingivitis.

**Results:** TRAIL gene expression was significantly upregulated in the epi4 cells by the coculture with both strains of *P. gingivalis*. In the gingival tissues the number of DcR-1-expressing cells appeared to be greater than those of the other receptors. TRAIL-R1 was rarely detected in both gingivitis and periodontitis tissues. In contrast, the number of DcR-2-expressing mononuclear and epithelial cells was significantly higher in periodontitis tissues than in gingivitis tissues.

**Conclusion:** The results indicate that gingival epithelial cells modulate local inflammatory response by the expression of TRAIL that is induced by *P. gingivalis*, thereby contributing to the pathogenesis of periodontal disease.

## Topic: Basic Research: Aetiology and Pathogenesis

## P0560

**Upregulated toll-like receptor (TLR) signaling pathway in periodontitis-affected gingival tissues.**

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**Aim:** Toll-like receptor (TLR) signaling is known to be one of the most important pathway initiating onset of the periodontitis. We have previously reported that TLR signaling pathway was significantly up-regulated in periodontitis-affected gingival tissues by pathway frequency analysis. The purpose of this study was to analyse gene profiles and the expression levels which belong to TLR signaling pathway.

**Material and Methods:** Fourteen healthy and 14 periodontitis-affected gingival tissues were taken from patients with severe chronic periodontitis and the total RNAs were purified. Quantitative reverse transcription real-time polymerase chain reaction analysis was performed for five genes belonging to the TLR pathway: Cluster of differentiation 14 (CD14), Lymphocyte antigen 96 (MD-2), Interleukin-1 beta (IL-1β), Interleukin 8 (IL-8), and Chemokine ligand 9 (CXCL-9).

**Results:** Five genes (MD-2: p<0.0082, CD14: p<0.0322, IL-1β: p<0.0126, IL-8: p<0.0438, CXCL-9: p<0.0082) in TLR signaling pathway were significantly up-regulated, which was consistent with our previous results of the pathway frequency analyses.

**Conclusion:** We first reported that MD-2, CD14, IL-1β, IL-8 and CXCL-9 in TLR signaling pathway was significantly upregulated in periodontitis-affected gingival tissues, compared with healthy controls. Thinking that, CD14 acts as a receptor for bacterial lipopolysaccharide and binds to TLR4 and MD-2 stimulating immune responses such as interleukins and chemokines production, these genes could be considerably related to the pathogenesis of periodontitis.

Topic: Basic Research: Aetiology and Pathogenesis

**P0561**

### Comparative analysis of microRNA and mRNA expression profile in mesenchymal stem cells derived from dental tissues and bone marrow

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Seoul/Korea

**Aim:** Various dental stem cells derived from human dental tissues have been identified as the mesenchymal type of adult stem cells. However, little is known about the characteristics of dental stem cells. MicroRNAs(miRNAs) are short, noncoding RNAs that act as key regulators of diverse biological processes by mediating translational repression or mRNA degradation of their target genes. The aim of this study is to compare the miRNA and mRNA gene expression profile in mesenchymal stem cells derived from dental tissues and bone marrow for characterization of dental stem cells.

**Material and Methods:** We performed the expression profiling of both 1,205 kinds of miRNA and 32,321 mRNAs of 5 samples from bone-marrow-derived mesenchymal stem cells(BMSCs), periodontal ligament stem cells(PDLSCs), and dental pulp stem cells(DPSCs).

**Results:** We identified 68 up-regulated and 64 down-regulated transcripts in PDLSCs, and 218 up-regulated and 231 down-regulated transcripts in DPSCs. And we also identified differentially expressed miRNAs and mRNAs and then selected highly co-related miRNA and mRNA pairs. Based on these mRNA sets, GO(Gene Ontology) and pathway enrichment analysis were additionally performed.

**Conclusion:** This study represents the first integrated analysis of miRNA and mRNA expression profiles of dental stem cells and compares them to those of BMSCs. The difference of the expression profile of BMSCs, PDLSCs and DPSCs were showed and the candidate mRNA-miRNA target genes were found. These data provide the first step for discovering key molecules to determine the characteristics of dental stem cells.

Topic: Basic Research: Aetiology and Pathogenesis

**P0562**

### Gingival crevicular fluid Interleukin-1 $\beta$ levels during two different canine distalization methods

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**Aim:** In this study, we compared GCF interleukin-1 $\beta$  (IL-1  $\beta$ ) levels in patients treated with two different canine distalization techniques.

**Material and Methods:** Ten healthy adolescents (mean age 14 yr, 4 male and 6 female) starting orthodontic treatment were participated in this split mouth designed study. In each subject, right maxillary canine received interrupted force (IF group) with lace back ligatures and left canine received continuous force (CF group) by using coil springs. Periodontal health status of patients were evaluated by probing pocket depth (PD), gingival

index (GI) and plaque index (PI). The gingival crevicular fluid (GCF) was collected from mesial and distal sides of maxillary canines and mesial of first molars before attaching the appliances and 1 day, 1 week, 1 month after, and at the end of distalization period. GCF IL-1 $\beta$  levels were determined by enzyme linked immunosorbent assay.

**Results:** Elevated GCF IL-1 $\beta$  levels at distal side of canines in IF group were observed at 1 week, and 1 month after activation ( $p < 0.05$ ). When compared with CF group, the changes in GCF IL-1 $\beta$  levels were greater in canine distal sides of IF group at 1st day. At the end of distalization period, there was no significant difference for GCF IL-1 $\beta$  levels in between intragroup and intergroup comparisons ( $p > 0.05$ ).

**Conclusion:** Within the limits of this study, we conclude that timely reactivated mechanical stress initially can upregulate IL-1 $\beta$  levels during tooth movement, but periodontal tissue microenvironment seems to stabilize a new homeostasis at the late-phase, probably with various feedback mechanisms.

This study was supported by Selcuk University, Scientific Research Projects fund (2003-071).

Topic: Basic Research: Aetiology and Pathogenesis

**P0563**

### Diabetes enhances inflammatory response and apoptosis of periodontium in Aggregatibacter actinomycetemcomitans infected rats

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**Aim:** To test the hypothesis that diabetes aggravates periodontal destruction induced by Aggregatibacter actinomycetemcomitans (Aa) infection with an increased inflammatory response and enhanced apoptosis of matrix-producing cells by an Aa rat feeding model.

**Material and Methods:** Thirty-eight diabetic and 33 normal rats were inoculated with Aa. The rats were euthanized at baseline, 4, 5 and 6 weeks after inoculation. Distance between the CEJ and the highest peak of the interproximal bone was measured with Hematoxylin-Eosin-stained sections. The infiltration of PMNs in gingival epithelium was also measured. The numbers of cells expressing TNF- $\alpha$  in gingival epithelium and connective tissue areas were evaluated by immunohistochemistry. Apoptotic cells in epithelium and gingiva were detected by TUNEL assay.

**Results:** After Aa infection, the distance from the CEJ to the bone crest in diabetic rats was 1.7-fold greater in normal rats. The number of infiltrated PMNs in gingival epithelium of diabetic rats was 1.6-fold greater than that in normal rats. The number of TNF- $\alpha$  positive cells was 1.5-fold higher and the apoptotic cells percentage was 1.9- to 3.1-fold higher in diabetic vs. normal rats, respectively. Antibiotic treatment alone had no effect on reduction of apoptotic cells, but antibiotic treatment combined with caspase-3 inhibitor significantly blocked the increase of non-inflammatory cell apoptosis in gingival epithelium and connective tissue.

**Conclusion:** Diabetes affects Aa induced periodontal destruction by significantly increasing inflammatory response and apoptosis of gingival epithelial and connective tissue cells. The excessive production of TNF- $\alpha$  could be one potential way through which diabetes enhances this caspase-3-dependent apoptosis.

## Topic: Basic Research: Aetiology and Pathogenesis

**P0564****N-acetylcysteine decreases alveolar bone loss on experimental periodontitis in streptozotocin-induced diabetic rats**

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**Aim:** The purpose of this study was to evaluate morphometric and histopathological changes associated with experimental periodontitis in diabetic rats in response to systemic administration of N-acetylcysteine (NAC).

**Material and Methods:** Sixty Wistar rats were divided into six experimental groups: non-ligated (NL) group; ligature only (LO) group; Streptozotocin only (STZ) group; STZ and ligature (STZ+LO) group, systemic administration of NAC and ligature (70 and 100 mg/kg body weight per day, respectively) (NAC70 and NAC100 groups). Diabetes mellitus was induced by 60 mg/kg streptozotocin. Silk ligatures were placed at the gingival margin of lower first molars of mandibular quadrant. Study duration was 11 days and the animals were sacrificed at the end of this period. Changes in alveolar bone levels were clinically measured and tissues were histopathologically examined.

**Results:** At the end of 11 days, alveolar bone loss was significantly higher in the STZ+LO group compared to other groups ( $p < 0.05$ ). Also, alveolar bone losses in all NAC groups were significantly lower than those of STZ+L and LO groups ( $p < 0.05$ ). The osteoblastic activity in NAC100 group was significantly higher than those of other groups ( $p < 0.05$ ).

**Conclusion:** The findings of this study provide morphologic and histologic evidence that systemically administered NAC prevents alveolar bone loss in diabetic rat model.

## Topic: Basic Research: Aetiology and Pathogenesis

**P0565****Effects of Continuous and Interrupted Orthodontic Force on Gingival Crevicular Fluid MMP-1 and TIMP-1 Levels**S.S. Hakkı<sup>1</sup>, S. Usumez<sup>2</sup>, Z. Sari<sup>3</sup>, G. Tatar<sup>1</sup>, N. Dündar<sup>1</sup>, T. Ataoglu<sup>1</sup><sup>1</sup>Konya/Turkey, <sup>2</sup>Istanbul/Turkey, <sup>3</sup>Antalya/Turkey

**Aim:** The objective of this study was to evaluate the levels of the MMP-1 and TIMP-1 in the GCF during two different canine distalization techniques.

**Material and Methods:** Ten healthy adolescent patients were included. In each subject, left maxillary canine received continuous force (CF) with a coil spring and right maxillary canine received an interrupted force (IF) with lace back ligatures. GCF samples collected from the mesial and distal sides of both maxillary canines and mesial sides of each anchored first molars before activation and 1 day, 7 days, 30 days after. In this time periods, clinical parameters (gingival index, periodontal index, pocket depth) were also recorded. GCF samples were collected with periopaper strips and analyzed by ELISA.

**Results:** At 7 days, GCF MMP-1 levels in IF group was significantly higher than CF group in distal side of canine. Significantly elevated TIMP-1 levels was observed in canine mesial at 30 days in CF group.

**Conclusion:** Within the limits of this study, we conclude that mechanical stress due to orthodontic force can upregulate the MMP-1 and TIMP-1 levels, but there might be limitations in increasing because of the feedback mechanisms.

## Topic: Basic Research: Aetiology and Pathogenesis

**P0566****Prolyl hydroxylase inhibitors decrease plasminogen activation in periodontal fibroblasts**

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**Aim:** Prolylhydroxylase inhibitors such as L-mimosine and dimethylallyl glycine (DMOG) have recently been recognized as promising drug for the treatment of inflammatory diseases, also because they control the plasminogen activation system. This, however, has not been shown in cells of the periodontium.

**Material and Methods:** Here we assessed the effect of L-mimosine on the plasminogen activation of periodontal fibroblasts. Fibroblasts from the gingiva and periodontal ligament were incubated with L-mimosine and DMOG. To simulate pro-inflammatory conditions the experiments were performed in the presence of interleukin (IL)-1. Plasminogen activators and plasminogen activator inhibitors were analyzed by zymography and quantitative polymerase chain reaction.

**Results:** Kinetic assay and zymographies showed that prolylhydroxylase inhibitors reduced urokinase-type plasminogen activator activity in fibroblasts of gingiva and periodontal ligament, also in the presence of IL-1. Quantitative polymerase chain reaction indicated that the reduced plasminogen activation was a consequence of reduced urokinase-type plasminogen activator and elevated plasminogen activator inhibitor-1.

**Conclusion:** These findings suggest that periodontal fibroblasts are responsive to prolylhydroxylase inhibitors that can control the plasminogen activation system.

## Topic: Basic Research: Aetiology and Pathogenesis

**P0567****The prevalences of subgingival periodontal microbiota in artificial class III furcation defects. An experimental study in monkeys**W. Zhu<sup>1</sup>, J. Hou<sup>1</sup>, K. Liu<sup>1</sup>, H. Meng<sup>1</sup>, X. Tang<sup>2</sup><sup>1</sup>Beijing/China, <sup>2</sup>Shenyang/China

**Aim:** To longitudinally evaluate the change of prevalence of five periodontal putative pathogens in the subgingival plaque of normal furcation areas and artificial class III furcation defects before and after periodontal therapy.

**Material and Methods:** Eighteen class III FI defects were created at mandibular molars and second premolars of three adult



male *Macaca fascicularis*. The samples of subgingival plaque were obtained from normal furcation areas and artificial class III furcation defects before and 6 months after periodontal surgery. Five periodontal putative pathogens, including *Porphyromonas gingivalis* (Pg), *Tannerella forsythensis* (Tf), *Treponema denticola* (Td), *Actinobacillus actinomycetemcomitans* (Aa) and *Fusobacterium nucleatum* (Fn), were detected with 16SrRNA based PCR.

**Results:** The prevalence of Pg, Tf, Td and Fn was significantly increased, from 58.3% to 88.9%, 47.2% to 83.3%, 13.9% to 61.1% and 69.4% to 91.7%, respectively. The prevalence of Fn was the highest. The prevalence of Aa was the lowest and no obvious difference among three samplings, which was from 13.9% to 33.3%. The prevalence of more than 3 species simultaneously detected was significantly increased from 38.9% to 61.1% to 83.3%. The red complex was significantly increased from 8.3% to 27.8% to 44.4%.

**Conclusion:** The periodontal pathogenic bacteria are correlated with the severity of local inflammation. The red complex play important role in the pathogenesis of periodontitis. Fn may be a resident bacteria in the subgingival plaque, play a bridge role on the biofilm formation and maturation. Aa may not be a mainly causative bacteria in the clinical periodontitis.

Topic: Basic Research: Aetiology and Pathogenesis

P0568

### A novel method of identification and characterization of Periopathogens

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**Aim:** The aim of this study was to investigate the most common group of predominantly bacteria that colonize the subgingival plaque of young periodontal patients. .

**Material and Methods:** A number of periopathogen species, of the red complex, was provided from special microbial collection Tables of Sweden and Germany. Fourier Transform Infrared Spectroscopy (FT-IR) with Attenuated Total Reflectance (ATR) technique was used. .Then samples of subgingival calculus and gingival crevicular fluid were taken from periodontal patients. Each sample was examined both with PCR (Polymerase Chain Reaction) analysis and FT-IR spectroscopic analysis for detection and identification of the bacteria. Repeated spectra can be taken for the verification of the results. The FT-IR spectroscopy is a non destructive method and infrared signals of microorganisms serve as highly specific fingerprints that can be used in the identification of periopathogenic bacteria of the mouth. FT-IR spectra of these species were recorded.

**Results:** The results of both analyses were nearly identical. In this way the two analyses were compared, with the FT-IR being better and faster.

**Conclusion:** In conclusion, FT-IR spectroscopy can be applied to characterize microbial environment of subgingival plaque in patients with periodontal disease, because it can provide information about their bacteria composition. The method, is diagnostic and superior to PCR, since it takes much less time for analysis and it shows repeatability potential to frequent and long term following up of the patient. The ATR-FT-IR spectroscopy is a non destructive method analysis with a potential for complete computerization.

Topic: Basic Research: Aetiology and Pathogenesis

P0569

### COMPARISON OF TrkA EXPRESSION AND IB4 BINDING IN TRIGEMINAL NEURONS INNERVATING GINGIVOMUCOSAL AND PULPAL TISSUE IN THE RAT

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**Aim:** The morphometry and chemophenotypes of trigeminal ganglion (TG) neurons innervating the rat gingivomucosal and pulpal tissue was compared after retrograde nerve labeling.

**Material and Methods:** In 6 rats a retrograde nerve tracers TrueBlue (TB) or Fluorogold (FG) was applied into the gingival sulcus or into the standard-sized tooth cavity, respectively. The cavities prepared to the level of dental pulp were filled with Cavit. After 10 days, TGs were dissected and FG or TB fluorescence observed under fluorescent microscope. Expression of TrkA and binding of IB4, both characteristics known to be associated with nociceptive neurons, were investigated by immunohistochemistry.

**Results:** We found no double labeled neurons. The average cross-section areas of TG neurons projecting to the gingivomucosa and dental pulp were  $918 \pm 447 \mu\text{m}^2$  and  $1016 \pm 388 \mu\text{m}^2$ , respectively. The shares of small ( $< 500 \mu\text{m}^2$ ) neurons among all neurons projecting to gingivomucosa or dental pulp were 21% and 8%, respectively, ( $p < 0.05$ ). The shares of TrkA-positive neurons among all neurons projecting to gingivomucosa or dental pulp were 76% and 86%, respectively, ( $p < 0.05$ ). 22% and 3% of all neurons projecting to gingivomucosa and dental pulp, respectively, were IB4-positive. The difference was statistically significant ( $p < 0.05$ ).

**Conclusion:** The great majority of neurons projecting to rat pulp and significant portion of neurons innervating gingivomucosa contain TrkA receptor, which is exclusively expressed in nociceptive neurons. However, nociceptive neurons projecting to dental pulp are larger and don't have affinity to bind IB4.

Topic: Basic Research: Aetiology and Pathogenesis

P0570

### Microbiological diversity of localized aggressive periodontitis by 16S rRNA clonal analysis.

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**Aim:** The purpose of this study was to determine the bacterial diversity in the subgingival plaque of subjects with localized aggressive periodontitis (LAgP) by using capillary-based Sanger sequencing on 16S rRNA gene.

**Material and Methods:** Thirty subjects were assigned into two groups: LAgP (n=15), consisting of subjects with LAgP; and PH (n = 15), consisting of subjects with periodontal healthy (PH). Two subgingival samples were taken in the LAgP group [probing depth (PD)  $>5\text{mm}$  and  $\text{PD} < 3\text{mm}$ ] and one in the PH group. DNA was extracted and 16SrRNA bacterial genomic

libraries were constructed and sequenced. Bacterial diversity was estimated and a phylogenetic tree was built.

**Results:** A total of 2.041 clones were analyzed (mean,  $45.4 \pm 4.5$  clones per sample) and 164 phylotypes were identified. Of these, 42% were represented by not-yet cultivated phylotypes. Associations with LAgP were observed for several uncommon species or phylotypes, such as *Selenomonas sputigena*, *Filifactor alocis*, *Pseudoramibacter alactolyticus*, *Dialister pneumosintes*, *Dialister invisus*, *Synergistes* sp. BH007/OT359, *Prevotella* sp. AH125/OT292, *Desulfobulbus* sp. R004/OT041 and *Selenomonas* sp. DS051/OT137. Species or phylotypes more prevalent in periodontal health included species of *Streptococcus*, *Actinomyces* sp. BL008/OT171 and *Actinomyces* sp. IP073/OT448. Species or phylotypes from the genus *Parvimonas*, *Pseudoramibacter*, *Synergistes*, *Dialister* and *Filifactor* was found in higher prevalence in shallow sites from LAgP subjects when compared with PH.

**Conclusion:** Species or phylotypes not previously associated with LAgP may be involved with the disease. In addition, there are differences between the microbial diversity present at shallow sites of subjects with PAgL and PH.

Topic: Basic Research: Aetiology and Pathogenesis

## P0571

### A novel optimization model for determining combinations of biomarkers that predict periodontal health or disease from GCF samples based on high-throughput proteomic analysis

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**Aim:** To develop an optimization model to predict the periodontal status of a patient based on the existence of protein biomarkers within gingival crevicular fluid (GCF).

**Material and Methods:** GCF samples were collected from thirty-seven periodontally healthy and thirty-seven chronic periodontitis subjects. The samples were digested with trypsin, fragmented using tandem mass spectrometry, and analyzed with PILOT\_PROTEIN to identify the proteins. A mixed-integer linear optimization model was developed to identify the optimal combination of biomarkers which could clearly distinguish a blind subject sample as either healthy or diseased.

**Results:** The mathematical model was trained on a mixture of periodontally healthy and periodontally diseased samples. The resulting biomarkers that could best distinguish the samples in the training set were tested against a blind set of samples. The mathematical model was able to consistently achieve a high degree of accuracy (i.e., greater than 90%) when annotating the testing set samples. The effect of training sample size was investigated and it was found that the model was able to maintain a high accuracy when utilizing a training set containing as few as ten samples.

**Conclusion:** The novel optimization model is capable of consistently predicting a small set of biomarker proteins which can identify samples as periodontally healthy or diseased with a high accuracy.

Topic: Basic Research: Aetiology and Pathogenesis

## P0573

### TSP1 and MMP9/NGAL involvement in angiogenesis in PDL during orthodontic treatment

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**Aim:** Angiogenesis is represented by the formation of new blood vessels and is the result of a balance between the angiogenic and antiangiogenic molecules. The complex MMP9/NGAL (Matrix metalloproteinase 9/Lipocalin) is a 130 kDa weight protein, in which NGAL has the role to protect the molecules of MMP9 against their degrading. TSP1 (Thrombospondin-1) is a glycoprotein and is one of the endogenous inhibitors of angiogenesis. In the present study we aimed to measure the levels of MMP9/NGAL and TSP1 in gingival crevicular fluid (GCF) at different time point of orthodontic treatment (one hour before and 1, 4, 8, 24, 72 hours and 1, 2 weeks after activation) to determine the relationship between them and their possible involvement in angiogenesis balance.

**Material and Methods:** GCF samples were collected from 18 orthodontic patients requiring canine distalization with first premolar extraction. For the orthodontic appliance, there were used brackets Roth 0.018 inch with 0.012 inch NiTi archwire and a laceback placed on the test tooth. The contralateral canine was control tooth. Levels of MMP9/NGAL and TSP1 were determined with ELISA technique. Statistically significant differences and correlations were analysed with SPSS 16.0

**Results:** MMP9/NGAL has the same pattern in time with TSP1, the correlations between them being strong and significant. Maximum levels for both of them was registered at 72 hours from baseline, with a decrease at baseline level in two weeks.

**Conclusion:** This study show a change in time of MMP9/NGAL and TSP1 levels in GCF of patients with orthodontic treatment and the strong involvement of MMP9/NGAL and TSP1 in angiogenesis processes in PDL.

Topic: Basic Research: Aetiology and Pathogenesis

## P0574

### The Expression of IL-6 in Cyclosporine A-induced gingival overgrowth

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**Aim:** To speculate the effect of IL-6 in cyclosporine A (CsA) induced gingival overgrowth.

**Material and Methods:** Fibroblast and epithelial cell cultures were established from systemically healthy gingival tissue donors and were challenged with CsA in different concentrations (600ng/ml, 800ng/ml, 1000ng/ml) and different time (48hs, 72hs), cell cultures treated without CsA as control. After incubation, the culture supernatants were collected and analyzed for IL-6 component by ELISA while IL-6 express in both cells were analyzed by immunohistochemistry.

**Results:** The cell growth curves of gingival epithelial challenged with CsA share the same tendency with the control, but more cell proliferation than the latter ( $P < 0.05$ ). As for gingival fibroblasts, no significant difference between test and control was found. Although associated with the challenge concentration and time, there was no significant difference between the IL-6 express of gingival epithelial and fibroblasts after treated with CsA. When analyzing the IL-6 component from the culture supernatants, we found gingival epithelial secret IL-6 in 72hs more than the other groups, while gingival fibroblasts secret less in 72hs group treated with 1000ng/ml CsA than 48hs group. No significant difference was found when compare the secret IL-6 of gingival epithelial between test and control group. The gingival fibroblasts secret significant more IL-6 than control until under the stimulation of 1000ng/ml CsA round 48hs ( $P < 0.05$ ).

**Conclusion:** CsA promote the proliferation of gingival epithelial; IL-6 may not be the main cytokine of gingival epithelial, and most IL-6 in CsA-induced gingival overgrowth probably secreted by gingival fibroblasts.

Topic: Basic Research: Aetiology and Pathogenesis

**P0575**

### The Prevalence of Red Complex Bacteria in a Group of Romanian Subjects and Antibiotics Treatment Effects Highlighted by Using DNA-STRIP Technique

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**Aim:** The aim of this study was red complex bacteria detection before and after systemic antibiotic administration to a group of patients with chronic periodontitis.

**Material and Methods:** 70 patients aged from 20 to 84 years old (mean age 52) were selected from this study. 22 of them were without periodontal disease, 4 with gingivitis and 44 with chronic periodontitis. Subgingival plaque samples were obtained from 5 sites for Porphyromonas gingivalis (Pg), Tannerella forsythia (Tf) si Treponema Denticola (Td) identification through PCR technique. The first prelevation was made at presentation and the second 2 months after the end of the treatment (including cleaning and systemic antibiotics). We used Amoxicilin+Meetronidazole, Clyndamicin or Doxycyclin in 3 schemes depending on bleeding on probing, probing depth and radiological aspects.

**Results:** Pg was found in 93,3% of the patients, Tf in 96,6% and Td in 90%. After antibiotic treatment Pg prevalence was 43,7% with increased bacteria concentration, Tf prevalence was 52,17% with decreased bacteria concentration and Td was observed in 65,2% cases with constant bacteria concentration. At 5 cases we didn't find any bacteria.

**Conclusion:** Antibiotics administration is absolutely necessary in periodontal disease treatment. Decreasing or total absence of bacteria has been obtained in multiple antibiotics administration, for a long period.

Topic: Basic Research: Aetiology and Pathogenesis

**P0576**

### Analysis and location of growth factors implicated in periodontal healing, and present in the amniotic membrane

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Beirut/Lebanon

**Aim:** Objective: The aim of this study is to search in the AM for growth factors important in healing and cell proliferation for a possible use of this membrane in bone and periodontal regeneration

**Material and Methods:** : Reverse transcription polymerase chain reaction (RT-PCR), western blotting (WB) and immunohistochemistry were used to put in evidence four growth factors: Platelet Derived Growth Factor (PDGF), Transforming Growth Factor beta (TGF- $\beta$ ), Insulin like growth factor (IGF), Vascular Endothelial growth factor (VEGF).

**Results:** Western Blotting and Immunohistochemistry demonstrated the presence of IGF, PDGF, TGF $\beta$ , and VEGF. IGF, PDGF-A and VEGF were shown to be present on the transcriptional level in the cytoplasm and especially on the apical end of the AM epithelial cells. PDGF-B was not expressed in the amniotic membrane.

**Conclusion:** These results may suggest the AM could play a role in bone formation and periodontal healing

Topic: Basic Research: Aetiology and Pathogenesis

**P0577**

### A link between tobacco smoking and selected clinical and biochemical parameters of inflammation among the patients with chronic periodontal disease.

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Poznan/Poland

**Aim:** The periodontal status of 34 patients age 32-60, including 18 smokers was evaluated. It was based on the medical history, progress of periodontal disease measured by probing pocket depths, attachment loss. Analysis of acute phase proteins and total antioxidant status were performed by means of immunoelectrophoresis. The measurements were performed on behalf of the Statistica 7 as well as trees analysis. The result suggest that the effect of a bacterial biofilm and smoking is more important for development on the pathological process than gender or other factors in the medical history.

**Material and Methods:** The periodontal status of 34 patients age 32 to 60 years, including 18 smokers was evaluated. It was based on the medical history, progress of periodontal disease measured by probing pocket depths and attachment loss, oral hygiene status and presence of gingivitis. Analysis of acute phase proteins and total antioxidant status as a response to chronic inflammation in the oral cavity were performed by means of immunoelectrophoresis according to the Laurell and Randox tests. The measurements were performed on behalf of the statistic package GenStat, Statistica 7 and StatXact 4.0.1. as well as trees analysis acc. to Persons.

**Results:** The result suggest that the effect of a bacterial biofilm, deepened pockets and smoking is more important for development on the pathological process than gender or other factors in the medical history.

**Conclusion:** Inflammatory processes, even of very low activity and of any origin may contribute to disturbances of cardio-vascular system, mainly of sclerotic background. Smoking clearly contributes to inflammation and – as a consequence to all diseases that start with inflammatory processes.

Topic: Basic Research: Aetiology and Pathogenesis

**P0578**

### Gingival Crevicular Fluid Levels of Bone Turnover Markers in Elderly Subjects

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**Aim:** Elderly individuals might have altered bone metabolism due to ageing. The purpose of this study was to investigate bone turnover markers such as bone formation and resorption in gingival crevicular fluid (GCF) of elderly subjects with different periodontal disease.

**Material and Methods:** 39 elderly subjects aged older than 65 years including 16 with periodontally healthy, 13 with gingivitis and 10 with chronic periodontitis were included in the present study. All were systemically healthy and non-smokers. Clinical periodontal parameters including probing depth, clinical attachment level, presence of supragingival plaque, and bleeding on probing were assessed in all study subjects. GCF samples were collected from one single-rooted anterior upper or lower tooth in each group. GCF bone formation markers; alkaline phosphatase and osteocalcin as well as bone resorption markers; osteopontin, osteoprotegrin and human parathyroid hormone were analyzed by Enzyme-linked immunosorbent assay. Parametric and non-parametric tests have been used for statistical analyses.

**Results:** Elderly subjects with chronic periodontitis, gingivitis and healthy periodontium had similar GCF osteocalcin, osteopontin, osteoprotegrin and human parathyroid hormone levels ( $p>0.05$ ). Elderly subjects with chronic periodontitis and gingivitis had insignificantly higher GCF alkaline phosphatase levels compared to elderly subjects with the healthy periodontium ( $p=0.03$  and  $p=0.02$ , respectively).

**Conclusion:** Within the limitation of the present study, it may be concluded that local levels of bone turnover markers in GCF do not play a role in the pathogenesis of periodontal disease in elderly subjects.

Topic: Basic Research: Aetiology and Pathogenesis

**P0579**

### A link between tobacco smoking and selected clinical and biochemical parameters of inflammation among the patients with chronic periodontal disease.

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Poznan/Poland

**Aim:** The evaluation due to clinical, biochemical and statistical methods the progress of periodontal disease.

**Material and Methods:** The periodontal status of 34 patients age 32-60, including 18 smokers was evaluated. It was based on the medical history, progress of disease measured by probing pocket depths and attachment loss, OH an SBI. Analysis of acute phase proteins and total antioxidant status as response to chronic inflammation in the oral cavity were performed by means of immunoelectrophoresis. The measurements were performed on behalf of the Statistica 9 as well as Persons trees analysis.

**Results:** The result suggest that the effect of bacterial biofilm, deepened pockets and smoking is more important for development of the pathological process than gender or other factors in the medical history.

**Conclusion:** Inflammatory processes, even of very low activity may contribute to disturbances of cardio-vascular system, mainly on sclerotic background. Smoking clearly contributes to inflammation and – as a consequence to all diseases that start with inflammatory processes.

Topic: Basic Research: Aetiology and Pathogenesis

**P0581**

### Hypoxia related miRNA expression in periodontitis patients: a case control study

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**Aim:** The function of miRNAs in periodontal inflammation has not been investigated, because inflamed periodontium is thought to be hypoxic, we hypothesize that miRNA are upregulated in inflamed periodontal tissues. The objective of this study was to explore the hypoxia related miRNAs expression in periodontal inflamed and healthy gingival tissues.

**Material and Methods:** A case-control study was performed, were enroment 10 patients with chronic periodontitis and 10 healthy subjects were randomly selected. Gingival biopsies were obtained after aseptic collection. After RNA extraction, miRNA 20a, 30e, 93, 128 and 186 expression were analyzed by real-time quantitative reverse transcription polymerase chain reaction (RT-PCR). Data was analyzed using descriptive statistics and the association between variables was estimated through logistic regression models.

**Results:** mi RNAs 20a ( $p=0.02$ ), 30e ( $p=0.03$ ) and 93 ( $p=0.026$ ) were found to be upregulated in periodontitis patients, about two-fold compared with those in healthy gingival tissue showed significant differences between inflamed and healthy gingiva. Interestingly, miRNA128 were downregulated in periodontitis patients ( $p$

**Conclusion:** : This remarkable difference in miRNA profiles between periodontal diseased and healthy gingiva implicates a probable close relationship between miRNAs and periodontal inflammation. miRNAs may constitute excellent non-invasive disease biomarkers. Moreover, innovative strategies targeting miRNAs, aimed to reduce the levels of pathogenic or aberrantly expressed miRNAs or to elevate the levels of miRNAs with beneficial functions, have been developed and could be applied in the treatment of chronic immune inflammatory diseases. (FONDECYT 1100885)(FIC-ODO).



Topic: Basic Research: Aetiology and Pathogenesis

## P0582

### Osteonecrosis induced by bisphosphonates - literature review

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**Aim:** Bisphosphonates are drugs for inhibiting bone resorption used for the treatment of osteoporosis, multiple myeloma and skeletal complications of bone metastases. Osteonecrosis induced by bisphosphonates occurs when the presence of unhealed exposed bone persists for more than eight weeks in patients who have taken bisphosphonates and don't have history of radiotherapy. This review is an update of the relationship between osteonecrosis induced by bisphosphonates and dental implants.

**Material and Methods:** A bibliographic search was carried out using Pub-Med /Science Direct. The search terms used were: bisphosphonates, dental implants, oral surgery and osteonecrosis.

**Results:** In patients with bisphosphonates treatment during more than three years, it would appear advisable to cease medication for a minimum of three months before surgical intervention, due to related cases of osteonecrosis. In the case of dental implants, a minimum of three months after surgery is recommended before the bisphosphonates can be administered again. The literature includes only a minor number of cases of osteonecrosis following surgery in the oral cavity of these patients.

**Conclusion:** It is not contraindicated dental implant placement in patients who have been taking bisphosphonates orally for under three years prior to surgery providing they do not present other risk factors. Some controversy exists in the placement of dental implants in patients treated with these drugs. However, these patients have the risk of possible loss of implants and the risk of suffering a bony necrosis.

Topic: Basic Research: Aetiology and Pathogenesis

## P0583

### In vivo and in vitro evaluation of HMGB1 expression profile in periodontal disease.

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Araraquara-Sp/Brazil

**Aim:** to evaluate in vivo the expression of High Mobility Group Box-1 (HMGB1) in two experimental periodontal disease models and, in vitro, the expression of HMGB1 by murine periodontal ligament fibroblasts (mPDL).

**Material and Methods:** For the in vivo study, Wistar rats were divided into two groups: Control (sham operated) and Periodontal Disease (induced by ligatures around the mandibular first molars and LPS injections around the maxillary first molars). Animals were sacrificed 7, 15 and 30 days after baseline (n=6/group/period). HMGB1 expression in the gingival tissues was evaluated by Real-Time PCR. Alveolar bone loss was measured macroscopically after methylene blue staining and gingival inflammation was evaluated histologically (H/E).

**Results:** A progressive bone loss was observed in both models. A significant inflammatory process was observed at day 7 in the

ligature model and day 15 in the LPS model. Similarly, HMGB1 expression was increased after 7 and 15 days, respectively for the ligature and LPS models compared to the Control group ( $p < 0.05$ , ANOVA). In the in vitro study, mPDL cells were stimulated by Escherichia coli LPS or human recombinant IL-1b. After 4, 8 and 12 hours HMGB1 expression was evaluated by Real Time PCR and protein secretion was evaluated by Western blot. A significant increase in the HMGB1 expression was observed after 4h with a progressive reduction by 12h ( $p < 0.05$ , ANOVA). Protein secretion was increased at 8h and reduced by 12h.

**Conclusion:** In conclusion, both, in vivo and in vitro experiments suggest a participation of HMGB1 in the periodontal disease pathogenesis.

Topic: Basic Research: Aetiology and Pathogenesis

## P0584

### Comparison of subgingival microbial profiles of chronic periodontitis and periodontal health using the RNA-oligonucleotide quantification technique.

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**Aim:** To assess the prevalence, levels and proportions of uncultivated/unrecognized bacterial taxa, as well as "unusual" bacterial species in chronic periodontitis patients (ChP) and periodontally healthy individuals (PH) using RNA-oligonucleotide quantification technique (ROQT).

**Material and Methods:** ChP patients (n=19) and PH subjects (n=15) were selected and their clinical periodontal parameters were evaluated. Subgingival plaque samples were collected and analyzed for the prevalence, levels and proportions of 39 bacterial taxa, including cultivated and uncultivated/unrecognized microorganisms using ROQT.

**Results:** ChP subjects showed significantly higher mean counts, prevalence and proportion of *Tannerella forsythia*, *Treponema denticola*, *Porphyromonas gingivalis*, *Selenomonas sputigena*, *Filifactor alocis*, *Prevotella* sp. oral clone AH125 (Oral Taxon 292), TM7 sp. oral clone AH040 (OT 346), *Tannerella* sp. oral clone BU063 (OT 286), *Peptostreptococcus* sp. oral clone DA014 (OT 113) e *Selenomonas* sp. oral clone EW084 (OT 146), while *Actinomyces gerencseriae*, *Veillonella parvula*, *Atopobium rimae*, *Rothia dentocariosa/mucilaginosa* and *Actinomyces naeslundii* were found in higher mean counts and proportion in PH ( $p < 0.01$ ). Regarding "unusual" bacterial species, *S. sputigena* and *F. alocis* were positively correlated ( $r > 0.5$ ;  $p < 0.05$ ) and they both were correlated with PD increase ( $p < 0.05$ ). *Peptostreptococcus* sp. OT 113 was the only uncultivated bacterial taxon that showed a positive correlation with PD increase ( $r > 0.5$ ,  $p < 0.05$ ). Uncultivated/unrecognized taxa accounted for 42.8% and 44.1% of the subgingival microbiota in ChP and PH subjects, respectively.

**Conclusion:** The microbial profiles of uncultivated/unrecognized bacterial species and "unusual" bacterial species in subjects with ChP differs markedly from that observed in subjects with PH.

## Topic: Basic Research: Aetiology and Pathogenesis

## P0585

**The effect of Personal oral hygiene on clinical attachment loss in Brazilian Indians**M.C. Nascimento<sup>1</sup>, H.M. Lopes<sup>2</sup>, E.C. Carvalho<sup>2</sup>, P.R. Cury<sup>1</sup><sup>1</sup>Salvador/Brazil, <sup>2</sup>Salvador-State Bahia/Brazil

**Aim:** The benefits of personal oral hygiene in preventing periodontitis are still under debate. The aim of this study was to evaluate the effect of personal oral hygiene on plaque index (PI), bleeding on probing (BoP) and clinical attachment loss (CAL) in Brazilian Indians.

**Material and Methods:** The sample consisted of 226 Indians (19-77 years) from 10 isolated Indian Areas of the Northeast of Brazil. Full-mouth CAL, PI and BoP were registered by calibrated examiners. The following interview data were collected: age, sex, smoking habits, previous oral hygiene instructions, use of dentifrice, dental floss, mouth washing and adjuncts, type of toothbrushes and frequency of brushing.

**Results:** Males showed higher BoP compared to females ( $p = 0.01$ ), but PI and CAL did not differ between sexes ( $p < 0.56$ ;  $p < 0.18$ ). Older individuals showed higher PI, BoP, CAL ( $p < 0.002$ ). PI and CAL were higher in subjects who never received oral hygiene instruction ( $p < 0.004$ ). PI, BoP and CAL were lower in subjects brushing twice a day compared to lower frequencies ( $p < 0.000$ ), and in subjects using toothpaste ( $p < 0.001$ ). PI and CAL were lower in subjects using dental floss ( $p < 0.001$ ). Type of toothbrush or using mouthwash or other adjuncts did not affect PI, BOP and CAL ( $p < 0.32$ ;  $p < 0.78$ ;  $p < 0.17$ ).

**Conclusion:** In conclusion, regular personal oral hygiene using toothbrushes and dental floss had positive effect on the control of plaque, periodontal inflammation and clinical attachment level in the Kiriri Indians.

## Topic: Basic Research: Aetiology and Pathogenesis

## P0586

**Changes in proliferation and metabolism of human gingival fibroblast induced by cyclosporine A**

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Distrito Federal/Mexico

**Aim:** Cyclosporine A is an immunosuppressor used to prevent rejection of transplanted organs. Gingival overgrowth has been associated with cyclosporine treatment. About the 30 % of the patients treated with this drug develop the gingival overgrowth. However, the precise cellular events that lead to the pathology are unknown. The aim of this study is to understand how cyclosporine could be altering the function of gingival fibroblast leading to the loss of homeostasis in the tissue.

**Material and Methods:** A biopsy from the area with gingival overgrowth was taken in a patient treated with cyclosporine (PGE), another was taken from the palate of a healthy donor. Fibroblast primary cultures of the biopsies were used to assess growth rate by counting the number of fibroblast for 7 days every 24h. In addition, zymograms were performed to measure

gelatinolytic activity of both cultures. Finally, RT-PCR reactions were carried out to detect the presence of metalloproteinase type 1 (MMP-1).

**Results:** PGE gingival fibroblasts showed an exaggerated growth rate when compared to control fibroblasts. Zymograms showed an increment in gelatinolytic activity in PGE fibroblasts cultures. RT-PCR results for MMP-1 showed an inhibition in PGE cultures.

**Conclusion:** Cyclosporine was found to affect the cell cycle of fibroblasts by increasing their growth rate. Also MMP-1 expression was downregulated, which means that the first step of extracellular matrix degradation is inhibited, even though the other steps of degradation appeared to be increased.

## Topic: Basic Research: Aetiology and Pathogenesis

## P0587

**Effect of nicotine and Porphyromonas gingivalis lipopolysaccharide on endothelial cells in vitro.**N. An<sup>1</sup>, O. Andrukhov<sup>2</sup>, P.Q. Nguyen<sup>2</sup>, H. Rutschek<sup>2</sup>, M. Matejka<sup>2</sup>, X.H. Rausch-Fan<sup>2</sup><sup>1</sup>Beijing/China, <sup>2</sup>Vienna/Austria

**Aim:** Smoking is considered as a significant risk factor for periodontal disease. Numerous clinical studies show higher rate and severity of periodontitis in smokers compared to control non-smokers. In this in vitro study we investigated the impact of nicotine on functional properties of endothelial cells stimulated with lipopolysaccharide (LPS) of periodontal pathogen Porphyromonas gingivalis.

**Material and Methods:** Human umbilical vein endothelial cells (HUVECs) were stimulated with different concentrations of nicotine in the presence or in the absence of P. gingivalis LPS (1 µg/ml). Cell proliferation/viability was measured in MTT assay after 4-72 h of stimulation. Gene expression levels of adhesion molecules ICAM-1, VCAM-1, E-selectin, as well as IL-8 were measured using real-time PCR after 4 h stimulation.

**Results:** Nicotine in concentrations of 0.001 to 10 µM has no significant effect on the proliferation/viability of HUVECs neither in the absence nor in the presence of P. gingivalis LPS. However, proliferation/viability of HUVECs was significantly inhibited by 100 µM nicotine. The gene expression levels of all investigated molecules were significantly increased upon P. gingivalis LPS stimulation. Nicotine in concentrations of 0.1-1 µM seemed to slightly increase the gene expression of adhesion molecules ICAM-1 and VCAM-1, as well as that of IL-8. However, this effect was not observed at higher nicotine concentrations.

**Conclusion:** Our data suggest that nicotine might influence the inflammatory response induced in endothelial cells by periodontal pathogens. This might represent a new mechanism contributing to the deleterious effect of smoking in periodontal disease.

Topic: Basic Research: Aetiology and Pathogenesis

**P0588**

### Histological and metabolic characterization of an oral mucosa bioimplant in vitro

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**Aim:** The aim of this study is to develop a bioimplant of oral mucosa in vitro by coculture of gingival fibroblasts and keratinocytes in a membrane of swine intestinal submucosa.

**Material and Methods:** A palatal biopsy was carried out to develop two cell lines, gingival fibroblasts and keratinocytes. Both cell lines were enzymatically treated with a solution of collagenase type IV. In cell coculture condition, cells were seeded and analyzed with MTT probe to determine cellular proliferation and metabolic viability. Cells were cultured in a fenestrated membrane of swine intestinal submucosa.

**Results:** Three conditions were analyzed: 24 and 48 hours in time of culture, cell density, 20000 and 40000 cel/cm<sup>2</sup> and type of biological membrane, mesh and fenestrated. In none of the conditions studied was affected metabolic viability of cells. In addition, it was observed a statistically significant results in the type of biological membrane used

**Conclusion:** It was shown that to achieve a state of balance in cell growth the matrix used (membrane of swine intestinal submucosa) should be populated by an optimal number of a prior culture of keratinocytes and fibroblasts. It also indicates that enzymatic and mechanical manipulation should be carefully keratinocytes under strict control of time and exposure to enzymatic digestion.

Topic: Basic Research: Aetiology and Pathogenesis

**P0589**

### Altered functional loading accelerates temporomandibular joint degenerative condition in senescence-accelerated mice

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**Aim:** Loss of teeth due to advanced periodontitis causes overclosure, which is one of the reasons for the disorders in temporomandibular joint (TMJ). Using senescence accelerated mice (SAM) P8 which develop TMJ osteoarthritis-like symptoms with high frequency, we aimed to elucidate the molecular mechanisms underlying the disorder and to test whether altered functional loading induced by loss of proper occlusion accelerates degenerative conditions in TMJ.

**Material and Methods:** We used two to 4-month-old male SAMP8. They underwent tooth trimming of both upper and lower incisors every other day for 2 weeks to 4 months. Mice were retained on a soft diet and were subsequently sacrificed at appropriate intervals: 2 weeks, 2 months or 4 months. Age-matched wild-type or SAMP8 mice without tooth-trimming were served as controls. The TMJs were evaluated by histology, immunohistochemistry, in situ hybridization, and quantitative

real-time-PCR.

**Results:** Condylar cartilages of SAMP8 was thicker than that of wild-type condyles and collagens type II or type X-expressing chondrocytes were sparsely distributed in the cartilage matrix. SAMP8 displayed a decrease in Indian hedgehog (Ihh)-expressing chondrocytes. When altered functional loading was induced in SAMP8, mandibular condyles became morphologically and histologically defective: the condylar cartilages became smaller, produced less proteoglycans than non-trimming control group, and underwent abnormal chondrocyte maturation and mineralization. These changes were accompanied by further reduction in Ihh.

**Conclusion:** The results suggest that early degenerative TMJ conditions in SAMP8 involve the disruption of Ihh signaling and that altered functional loading accelerates the progression of the degenerative morbidity.

Topic: Basic Research: Aetiology and Pathogenesis

**P0590**

### Gingival crevicular fluid, serum levels of sRANKL, osteoprotegerin, IL-17 in rheumatoid arthritis and osteoporosis patients with periodontal disease.

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**Aim:** To evaluate gingival crevicular fluid (GCF) and serum levels of soluble receptor activator of nuclear factor-kappa B ligand (sRANKL), osteoprotegerin (OPG) and interleukin-17 (IL-17) in rheumatoid arthritis, osteoporosis, and systemically healthy patients with periodontal disease.

**Material and Methods:** GCF and serum samples were obtained before any periodontal intervention from 22 patients with rheumatoid arthritis, 19 patients with osteoporosis and 17 systemically healthy patients all with inflammatory periodontal disease. Full-mouth clinical periodontal measurements were recorded. sRANKL, OPG, IL-17 levels were determined by Enzyme-linked Immunosorbent Assay. Data were tested statistically by Kruskal-Wallis test and Spearman's correlation analysis.

**Results:** Clinical periodontal measurements were similar in the three study groups ( $p > 0.05$ ). GCF sRANKL, OPG, IL-17 concentrations, and sRANKL/OPG ratio were significantly higher in the rheumatoid arthritis group than the levels in the other groups ( $p < 0.05$ ). GCF total amounts of albumin, OPG and IL-17, sRANKL/albumin, OPG/albumin, IL-17/albumin levels were similar in the study groups ( $p > 0.05$ ). Serum sRANKL concentrations and sRANKL/OPG ratio were significantly higher, OPG concentrations were significantly lower in the rheumatoid arthritis group than the other groups ( $p < 0.05$ ). Serum IL-17 concentrations were significantly higher in the rheumatoid arthritis and osteoporosis groups than systemically healthy group ( $p < 0.05$ ).

**Conclusion:** Increased inflammatory mediator levels in rheumatoid arthritis patients despite the long-term usage of various anti-inflammatory drugs suggest that rheumatoid arthritis patients may have a propensity to overproduce these inflammatory mediators.

## Topic: Basic Research: Aetiology and Pathogenesis

**P0591****EVALUATION OF PERIODONTAL PATHOGENS OF THE MANDIBULAR THIRD MOLAR PERICORONITIS BY USING REAL TIME PCR**

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**Aim:** Pericoronitis is a term used to describe the inflammation around the crown of a tooth, usually of an incompletely erupted mandibular third molar. The aim of this study was to investigate the mandibular third molar pericoronitis flora by using real time PCR.

**Material and Methods:** Six-teen adults, suffering from mandibular third molar pericoronitis, were included in the study group. The control group consisted of four-teen adults without present and previous clinical signs and symptoms of mandibular third molar pericoronitis. The quantitative values of *Aggregatibacter actinomycetemcomitans* (Aa), *Campylobacter rectus* (Cr), *Fusobacterium nucleatum* (Fn), *Porphyromonas gingivalis* (Pg), *Prevotella intermedia* (Pi) and *Tannerella forsythia* (Tf) were evaluated in comparison with the healthy third molar flora by using real time PCR.

**Results:** Aa, Cr, Pg, and Pi were not statistically significant but numerically higher than the pericoronitis group. In samples from pericoronitis patients, statistically significant higher numbers of Tf was detected in contrast to samples from control subjects. The study revealed the strong relation between risk of pericoronitis and the presence of Tf. Individuals who have Tf in their samples present with an almost eight times the relative risk of pericoronitis as the individuals with the absence of Tf in their samples.

**Conclusion:** With the knowledge of the current study, it can be concluded that Tf plays an important role in the development of clinical symptoms related with pericoronitis. Further studies in large patient groups are needed to clarify the role of different pathogens in third molar pericoronitis.

## Topic: Basic Research: Aetiology and Pathogenesis

**P0592****Periodontal ligament cells and mechanical stress - a cell culture study**

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Pécs/Hungary

**Aim:** To investigate age-related changes in the biosynthetic capacity of prostaglandinE2 and the expression of the enzyme, cyclooxygenase-2 from PDL cells in response to mechanical compression and the activation of certain intracellular signal transduction proteins involved in stress- and survival pathways. We hypothesized that mechanical compression promotes the induction of COX-2, promoting PGE2 production in an age dependent-manner.

**Material and Methods:** Pieces of PDL were obtained exclusively from the middle of tooth root extracted for orthodontic or

prosthetic reasons from human donors aged 10-77y. Ligament samples were cultured in a medium containing fetal bovine serum and proliferated cells were passaged 4-6 times. The cells were subjected to a static compressive load (2g/cm<sup>2</sup>) applying a uniform compression for up to 48h. Culturing media were collected of both control and pressurized cells. ELISA, Western-blotting and immunocytochemical methods were used to analyze the production of inflammatory mediators; expression of cathepsins, and COX-2, and at the same time, activation of certain signaling proteins like ERK, JNK, p38, and Src.

**Results:** Age-related changes in PGE2 production and COX-2 expression varied among patient groups, in most cases compression stimulated these inflammatory responses. Early activation (as soon as 5 min) of protein kinases (ERK, p38. Src) was detected.

**Conclusion:** Periodontal ligament cells obtained from older donors do not have significantly greater COX-2 expression and PGE2 secretion in response to compressive force than those obtained from younger donors. These signaling molecules may be potent factors in the degradation of the periodontal ligament but unanimous increase in sensitivity to mechanical stress during aging has not been found.

## Topic: Basic Research: Aetiology and Pathogenesis

**P0593****Effect of Concomitant Nifedipine on Gingival Overgrowth Development During Tacrolimus Administration in Rats**

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Samsun/Turkey

**Aim:** Aim of this study is to compare gingival changes induced by short term and long term tacrolimus and nifedipine administration alone or in combination, using macroscopic, histopathologic and stereological methods and to evaluate immunohistochemically the role of PTEN expression, a protein that inhibit cell proliferation and induces cellular apoptosis, in drug-induced gingival overgrowth.

**Material and Methods:** : Eighty Sprague-Dawley male rats were equally divided into eight groups; group 1: tacrolimus 8 weeks, group 2: nifedipine 8 weeks, group 3: tacrolimus and nifedipin 8 weeks, group 4: %0.9 NaCl 8 weeks, group 5: tacrolimus 24 weeks, group 6: nifedipin 24 weeks, group 7: tacrolimus and nifedipin 24 weeks, group 8: %0.9 NaCl 24 weeks. Histomorphometric analysis included measurements of epithelial thickness, connective tissue thickness and height and stereological analysis included measurements of volumetric densities of fibroblasts, collagen fibers and vessels. In addition, phosphatase and tensin (PTEN) expression was determined immunohistochemically.

**Results:** Epithelial thickness and connective tissue thickness was significantly increased in groups 5,6, and 7 compared to control (P<0,05) while connective tissue height was significantly increased in groups 5 and 7 (P<0,001). Volumetric densities of fibroblasts and collagen fibers was significantly increased in group 7 compared to control (P<0,001). PTEN immunoreactivity was significantly decreased in all experimental groups compared to control groups (p<0.05).



**Conclusion:** The results of our study suggest that duration of drug administration seems to be a more important factor which affect the severity of gingival overgrowth compared to combined drug treatment and PTEN might play a role in the pathogenesis of gingival overgrowth.

Topic: Basic Research: Aetiology and Pathogenesis

## P0594

### Levels of *Selenomonas sputigena* and not-yet-cultivated *Selenomonas* phylotypes in subgingival biofilms of generalized aggressive periodontitis

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**Aim:** To compare the levels of *Selenomonas sputigena* and uncultivated/unrecognized *Selenomonas* species in subgingival biofilms from generalized aggressive periodontitis subjects (GAgP) and periodontally healthy individuals (PH).

**Material and Methods:** GAgP (n=15) and PH (n=15) subjects were recruited and their clinical periodontal parameters were evaluated. Subgingival plaque samples were collected (9 samples/subject) and analyzed for the levels of 10 bacterial taxa, including cultivated and uncultivated/unrecognized microorganisms using the RNA-oligonucleotide quantification technique (ROQT). Differences in the levels of the test taxa between groups were sought using the Mann-Whitney test.

**Results:** GAgP subjects showed significantly higher mean counts of *Porphyromonas gingivalis*, *Selenomonas sputigena* and *Selenomonas* oral clone CS002 (*Mitsukella* sp. Oral Taxon 131), while *Actinomyces gerencseriae* and *Streptococcus sanguinis* were found in higher mean counts in PH subjects ( $p < 0.01$ ). *Selenomonas* sp. oral clone EW084 (*Selenomonas* sp. OT 146) was only detected in the GAgP group. In the GAgP group, levels of *P. gingivalis* and *S. sputigena* were higher in sites with probing depth (PD)  $> 5$ mm than in shallow sites (PD  $< 3$ mm) ( $p < 0.01$ ). Furthermore, sites with PD  $< 3$ mm in GAgP subjects harbored higher levels of these two species than sites in PH subjects. There were positive correlations between PD and levels of *P. gingivalis* ( $r = 0.77$ ;  $p < 0.01$ ), *S. sputigena* ( $r = 0.60$ ;  $p < 0.01$ ) and *Selenomonas* *dianae* (oral clone EW076) ( $r = 0.42$ ,  $p < 0.05$ ).

**Conclusion:** *S. sputigena*, *Selenomonas* sp. oral CS002 (OT 131) and *Selenomonas* sp. oral clone EW084 (OT 146) may be associated with the pathogenesis of GAgP, and their role in the onset and progression of this infection should be further investigated.

Topic: Basic Research: Aetiology and Pathogenesis

## P0595

### Correlation between mutans streptococci and *Aggregatibacter actinomycetemcomitans* salivary levels, in Aggressive Periodontitis patients prior to periodontal therapy.

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Tel Aviv/Israel

**Aim:** Aggressive Periodontitis (AP) and Dental Caries are oral infectious diseases, caused by different types of bacteria. Whereas in AP the predominant pathogen is *Aggregatibacter actinomycetemcomitans* (Aa), it is well established that caries is caused by mutans streptococci (ms). In previous studies, it was observed that AP patients had significantly less proximal caries than a control matched group of patients. The purpose of the present study was to examine the correlation between ms and Aa salivary levels, as well as clinical periodontal parameters, of AP patients prior to periodontal therapy.

**Material and Methods:** The present study included 30 participants, who underwent the following oral and microbiological measurements: a. Clinical parameters recording: Probing depth. b. Saliva sample was plated on a selective TSBV agar for determination of Aa levels. c. Saliva ms levels was evaluated by a kit for evaluation of adherent salivary cariogenic bacteria (ms) (RY kit).

**Results:** A significant inverse correlation ( $P = 0.009$ , Spearman correlation test) was found between salivary levels of ms and Aa bacteria. Another significant association was found between salivary Aa counts and the percentage of periodontal pocket depth  $\geq 7$  mm (Spearman,  $P = 0.03$ ).

**Conclusion:** The inverse correlation between the ms and Aa salivary levels may support previous notion as to the existence of a salivary factor in Aa-positive subjects, which may have an inhibitory effect on ms. An association between Aa salivary counts and the number of deep periodontal pockets, reinforces the current approach of adjunctive antibiotic treatment to mechanical debridement.

Topic: Basic Research: Aetiology and Pathogenesis

## P0596

### Human periodontal ligament cells in bi-dimensional and three-dimensional cultures on the presence or not of bioactive glass particles

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**Aim:** The aim of this study was to evaluate the behavior of human periodontal ligament cells in 2D and 3D cultures on the presence or not of bioactive glass particles.

**Material and Methods:** Cells derived from the human periodontal ligament (hPDLs) were cultured on Thermanox™ coverslip (control); Thermanox™ coated-collagen type I (2D); Thermanox™ coated-collagen type I + bioactive glass particles (2D+BG); three-dimensional collagen type I gel (3D); and three-dimensional collagen type I gel + bioactive glass particles (3D+BG) for periods of up to 14 days. The following assays were conducted: cellular viability (MTT), alkaline phosphatase activity (ALP) – normalized by the total protein content, alkaline phosphatase immunolocalization, and mineralized nodule formation.

**Results:** The cellular viability was not significantly altered by the collagen or bioactive glass ( $P > 0.05$ ). The 2D exhibited a higher level of alkaline phosphatase (ALP) activity at 7 and 14 days ( $P < 0.05$ ). The ALP labeling was more intense for 3D+BG showing a typical expression pattern mainly adjacent to the BG particles. The mineralized matrix was greater for 3D+BG and 2D+BG, especially around the particles; however the presence of mineralized nodules were also evident for 2D and 3D groups.

**Conclusion:** These results demonstrated that all treatments provided an adequate environment for cell growth and viability. The BG particles presence favors ALP expression and calcium accumulation.

Topic: Basic Research: Aetiology and Pathogenesis

## P0597

### The role of calcineurin gene polymorphisms in cyclosporine-A induced gingival overgrowth

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**Aim:** Cyclosporine A is subject to metabolism and systemic clearance by cytochrome P450 (CYP) enzymes, specifically CYP3A4 and CYP3A5 in the bloodstream. The aim of this study was to determine the association between genotypes of the CYP3A gene polymorphisms and gingival overgrowth (GO) in kidney transplant patients treated with Cyclosporine-A (CsA).

**Material and Methods:** Genomic DNA was obtained from the blood of renal transplant patients receiving CsA therapy; 55 with gingival overgrowth and 70 with no sign of gingival overgrowth, and 75 healthy subjects. To identify SNPs in the functional domains, PCR and sequencing analysis were performed in the promoter region of CYP3A4 and CYP3A5 intron5 and exon7. Periodontal status was evaluated by measuring probing depth, plaque index, papilla bleeding and hyperplastic index.

**Results:** SNPs were detected in the promoter region of CYP3A4 and CYP3A5 intron5 and exon7. There were no significant differences in the genotype and allele frequencies of the study groups.

**Conclusion:** Based on the present data it might be suggested that genetic variance in the coding sequences of the CYP3A4 and CYP3A5 genes do not have a role in the pathogenesis of CsA associated GO.

Topic: Basic Research: Aetiology and Pathogenesis

## P0598

### Effect of inhaled corticosteroid and periodontal disease on nucleotide hydrolysis in rats

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**Aim:** To evaluate the effect of different concentrations of inhaled Budesonide and/or ligature-induced periodontal disease on serum nucleotide hydrolysis in Wistar rats.

**Material and Methods:** Twenty-six male Wistar were randomly allocated into 4 experimental groups. Control group (G1) did not receive any procedure. Group 2 (G2) was nebulized with saline solution (NaCl 0.9%). Groups 3 (G3) and 4 (G4) were nebulized with budesonide 30µg and 100µg, respectively. Periodontal disease (PD) was induced in G2, G3 and G4 by placement of silk ligatures around upper right molar. Saline or Budesonide were administered daily for 14 days. After this period, the animals were killed by decapitation, blood samples collected, centrifuged (5min/5000xg) for serum obtainment. Enzymatic activity was analyzed using a modification of the method described by Oses et al. 2004 method. For serum proteins evaluation was used Coomassie Blue method. Results were expressed as mean±SD nmolPi/min/mg protein and analyzed using Kruskal Wallis followed by Mann Whitney test ( $P < 0.05$ ).

**Results:** High concentration inhaled budesonide reduced ATPase enzymatic activity (G4) when compared to G1, G2 e G3 ( $0.84 \pm 0.53$  vs.  $1.98 \pm 0.52$ ,  $1.26 \pm 0.51$  and  $1.12 \pm 0.67$  nmolPi/min/mg protein, respectively). There was an increase in ADP hydrolysis in animals subjected to PD model (G2, G3 e G4) when compared to G1 ( $4.52 \pm 0.88$ ,  $3.39 \pm 1.50$  and  $3.29 \pm 0.92$  vs.  $1.86 \pm 0.71$  nmolPi/min/mg protein, respectively). No differences were found between groups considering AMP hydrolysis.

**Conclusion:** PD model increased ADPase activity independently of inhaled corticosteroids without alteration of ATP hydrolysis. On the other hand, high concentration of Budesonide decreased serum ATPase enzymatic activity in Wistar rats.

Topic: Basic Research: Aetiology and Pathogenesis

## P0599

### Tannerella forsythia levels in patients genetically susceptible/non-susceptible to periodontitis

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**Aim:** To compare the subgingival levels of *Tannerella forsythia* (T.f.) in subjects genetically susceptible and non-susceptible to periodontitis (PD) based on IL8 gene polymorphisms.

**Material and Methods:** Subgingival samples were obtained from 65 patients classified into four groups: genetically non-susceptible without PD (NSC), genetically non-susceptible with periodontitis (NSPD), genetically susceptible without PD (SC) and genetically susceptible with periodontitis (SPD). Two

healthy sites and 2 diseased sites were sampled in PD groups and only 2 healthy sites in the groups without PD. The diseased sites were selected in non-adjacent teeth with 5 mm probing depth (PPD) and bleeding on probing (BOP). The healthy sites had PPD<2 mm without BOP. The T.f. levels were determined by q-PCR.

**Results:** Sites of patients without PD (SC and NSC) had lower T.f. levels than diseased sites of patients with PD (SPD and NSPD) both between genetically susceptible (Mann Whitney,  $p<0.0001$ ) and genetically non-susceptible groups (Mann Whitney,  $p<0.0001$ ). Higher levels of T.f. were found in diseased sites of individuals who are genetically non-susceptible to PD (NSPD) compared to the same values of SPD group (Mann Whitney,  $p=0.0142$ ).

**Conclusion:** susceptibility to periodontitis given by the haplotype in the Interleukin 8 gene may influence the colonization of *T. forsythia* in subgingival sites.

Topic: Basic Research: Aetiology and Pathogenesis

P0600

### Protein Carbonyl Levels in Serum, Saliva and Gingival Crevicular Fluid in Chronic and Aggressive Periodontitis Patients

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**Aim:** Oxidative stress is a unifying mechanism for production of reactive oxygen species (ROS) and plays a significant role in the manifestation of periodontal disease. Protein carbonylation is a biomarker for oxidative damage to proteins, and reflects cellular damage induced by ROS. In this study, protein carbonyl (PC) levels in serum, saliva and gingival crevicular fluid (GCF) in patients with chronic periodontitis (CP) and aggressive periodontitis (AP) were evaluated.

**Material and Methods:** Thirty-five chronic periodontitis (CP) and 43 aggressive periodontitis (AP) patients and 32 periodontally healthy controls were included in the study. Following the clinical measurements and samplings, serum, saliva and GCF PC levels were measured by high-performance liquid chromatography.

**Results:** The differences in serum PC levels between the groups were not significant ( $p>0.05$ ). Salivary PC levels were significantly higher in CP group than AP group ( $p<0.05$ ), while the differences were not significant compared to controls ( $p>0.05$ ). In GCF, total PC values were highest in CP and lowest in control groups. The differences among the groups were significant ( $p<0.05$ ). Serum and GCF PC levels showed statistically significant weak positive and negative correlations with clinical periodontal parameters ( $p<0.05$ ).

**Conclusion:** The results suggest that serum and salivary PC levels do not significantly change in periodontitis compared to periodontal health, while total amount of PC in GCF significantly increases in periodontitis. This implies the significance of local protein carbonylation in the periodontal area in periodontitis. The higher PC levels in CP group than AP group suggest higher protein oxidation levels in CP patients.

Topic: Basic Research: Aetiology and Pathogenesis

P0601

### Regulatory role of the vascular endothelial growth factor (VEGF) in the gingival microcirculation under physiological and pathological conditions

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**Aim:** Aim of our study was to investigate the possible regulatory role of VEGF on the gingival venules in rats under physiological (healthy gingiva) and pathological (gingivitis, diabetes) conditions.

**Material and Methods:** The investigated materials (VEGF, VEGF receptor type 2 (VEGFR2) antagonist or saline) were dripped onto the gingiva between the lower incisors. Diameter changes of selected gingival venule were observed by vital microscopy combined with digital photography at lower incisors in specified times. Animals with healthy gingiva served as control. Venule diameter changes were compared to the start-up and to the values of the control group as well. Immunohistochemistry and western blot were also utilized to localize and to analyze VEGFR2s.

**Results:** In healthy gingiva, VEGF significantly and dose-dependently increased the venule diameter compared to saline. VEGFR2 antagonist did not cause any alteration. Premedication with the antagonist decreased the dilatatory effect of VEGF significantly. However, in case of gingivitis and diabetes significant vasoconstriction occurred for the antagonist and VEGFR2 overexpression was also detected both with immunohistochemical and western blot analysis.

**Conclusion:** These findings suggest that despite there is no remarkable VEGF production under healthy condition in gingiva, but VEGF is able to increase the gingival blood flow through the activation of VEGF receptors. Furthermore, both VEGF production and VEGFR2 expression are increased in gingiva during gingivitis and diabetes, and VEGF has an important role in the vasodilation of gingival venules. The mast cell-derived inflammatory and vasodilatory mediators after their VEGFR2 activation may also contribute to the attendant microcirculation changes.

Topic: Basic Research: Aetiology and Pathogenesis

P0602

### PERCEPTION OF GINGIVAL BLEEDING AMONG PREGNANT WOMEN IN THE ANTENATAL CLINIC OF THE LAGOS UNIVERSITY TEACHING HOSPITAL

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Lagos/Nigeria

**Aim:** To determine the perception of gingival bleeding and gingival status among the pregnant women who attend the antenatal clinic.

**Material and Methods:** Self-administered questionnaires were completed by the subjects. Demographic data, gestational age, presence/absence of bleeding on brushing, perception of gingival

bleeding rate and its aetiology were collected. Assessment of the bleeding rate was done by Dentist, descriptive and comparative analyses were done using Epi info (2008.)

**Results:** Four hundred and forty-five pregnant women participated. Their age ranged between 18 and 43 years with mean age of 30.3(±4.60). Gestational age was between 4 and 41 weeks, mean 23.33(±9.48). Of the 445 women, 79(17.8%) had gingival bleeding while brushing, 366(82.2%) had no bleeding. Examination revealed 379(89.2%) had pregnancy gingivitis while 66(14.8%) did not. 161(36.2%) thought bleeding is caused by hard tooth-brushing, 11(2.5%) pregnancy, 14(3.1%) trauma, 210(47.2%) unknown cause and 49(11%) other causes. Clinical rating of the responders' gingival bleeding showed, 333(87.9%) had mild gingivitis, 43(11.3%) moderate gingivitis and 3(0.8%) severe gingivitis.

**Conclusion:** There is a need to educate all women and institute early professional measures in order to prevent its progression to more serious periodontal and obstetric problems.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0603

#### Alveolar bone loss in nuclear families of aggressive periodontitis and the heredity of root shape

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**Aim:** to evaluate the status of alveolar bone loss in Aggressive Periodontitis (AgP) nuclear families, to explore the influence of teeth with root abnormality on residual alveolar bone, and to calculate the heredity of root abnormality, the premolar cone-root and proportion of crown and root.

**Material and Methods:** 19 AgP probands and their 38 parents were included. A full set of periapical radiographs of all the subjects were taken. The residual alveolar bone of each tooth was measured by the percentage of root length. The abnormality of roots was detected on a full set of periapical radiographs. The ratio of crown to root was calculated. The heredity grade of the premolar cone-root, proportion of crown and root, and root abnormality were computed.

**Results:** The average residual alveolar bone of the teeth with abnormality of roots and the normal teeth were 67.5±22.2% and 73.1±18.7% respectively, with statistical significance ( $P=0.001$ ). The heredity grade of the premolar cone-root was 46.6%; the heredity grade of proportion of crown and root was 46.8%; the heredity grade of root abnormality was 30.3%.

**Conclusion:** The residual alveolar bone of the teeth with root abnormality was less than that of normal teeth in nuclear families members. The heritability of the root abnormality, the cone-root and proportion of crown and root were 0.3-0.5, which means that genetic factors accounted for about one third to half of the efficiency for AgP.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0604

#### Effect of free fatty acids on proliferation of human periodontal ligament fibroblasts\*

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**Aim:** To investigate the effect of free fatty acids (FFAs) on proliferation of human periodontal ligament fibroblasts (hPDLFs) in vitro and to study the roles of free fatty acids in the mechanism between the metabolic syndrome (MetS) and periodontitis.

**Material and Methods:** HPDLFs were cultured in vitro which played vital role in the periodontium tissue repaired. HPDLFs were dealt with various concentrations of FFAs for 24h-72h and fibroblast proliferation was measured by colorimetric 3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide (MTT) assay.

**Results:** FFAs inhibited the proliferation of hPDLFs in a dose- and time-dependent manner with MTT assay ( $P<0.01$  vs. control respectively), the inhibition rate is the best significantly after cultured 48h ( $P<0.01$ ).

**Conclusion:** FFAs inhibit the proliferation of hPDLFs in vitro and which lead to the delayed repair of the periodontal tissue in obese patients.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0605

#### Oral microbiome of children: comparison of two clinical sampling methods for DNA pyrosequencing of subgingival biofilm

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**Aim:** Oral biofilms gain increasing importance as source of bacterial infections in the human organism. Latest studies reveal evidence that oral pathogens play a role in various inflammatory diseases. Few studies have deeply analyzed the composition of subgingival biofilm. Retrieving adequate and reproducible samples is a challenge. Thus the aim of this pilot study was to assess two clinical sampling techniques for their accuracy in reflecting subgingival microbiome sequence data.

**Material and Methods:** We compared two different clinical sampling methods: standardized paper points were inserted subgingivally before and after supragingival cleansing with sterile cotton swabs. Thus subgingival biofilm from 5 children aged eight to ten was sampled (paired samples). After DNA extraction microbiome community profiles in the subgingival biofilm were determined by 454 pyrosequencing of V5 and V6 hypervariable regions followed by bio-informatical analysis based on the software platform QIIME\* (Quantitative Insights Into Microbial Ecology).

**Results:** Sequence trimming resulted in 58,822 sequences. Qualitative concordance in bacterial composition can be shown within subjects regardless of the sampling method; differences between subjects visualized in bar charts are obvious. Principal coordinate analysis (PCoA) and hierarchical clustering on distance matrices calculated



with Unifrac showed a grouping of the paired samples on phylum level. No statistically significant difference ( $\alpha=0.05$ ) has been found between the subgingival sampling methods.

**Conclusion:** We conclude that supragingival cleansing with a sterile cotton swab does not affect the composition of subgingival biofilm, thus being irrelevant to the quality of subgingival samples prepared for molecular biological analysis.

Topic: Basic Research: Aetiology and Pathogenesis

## P0608

### Comparison of the photocytotoxicity of new phthalocyanine photosensitizers in human gingival fibroblast and Hep2 cell cultures

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**Aim:** To determine cytotoxicity and photocytotoxicity of new phthalocyanine photosensitizers (PCs) with verified antimicrobial effect in gingival fibroblasts and tumorous cells.

**Material and Methods:** Modified test of metabolic activity with tetrazolium blue dye was developed. Cytotoxicity and photocytotoxicity of seven new PCs was evaluated in vitro using human gingival fibroblast and stabilized Hep2 cell cultures. The toxicity of PCs was tested without and with the light exposition (580 nm of wavelength).

**Results:** Nearly all PCs were spontaneously non-toxic in gingival fibroblast cultures. Derivates 1040/123, 1069/190, and 1093/30 were non-toxic, derivates 1086/25, 1074/283, 1074/352, and 1099/227 revealed spontaneous toxicity in the Hep2 cell cultures. All PCs were photocytotoxic in both types of cells, based on various concentrations. There was no significant difference between reactions of both types of cells.

**Conclusion:** Light-activated PCs with antimicrobial activity and acceptable cytotoxicity need further research.

Topic: Basic Research: Aetiology and Pathogenesis

## P0609

### Obesity: A Possible Modifier of Periodontal Disease as a Chronic Inflammatory Process

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**Aim:** This study was conducted to evaluate possible effects of obesity on plasma levels of certain bioactive peptides and inflammatory cytokines in relation to clinical periodontal status. For this purpose, correlation between clinical periodontal measurements and plasma leptin, adiponectin, interleukin-6, C-reactive protein, soluble-intercellular adhesion molecule-1, and albumin levels of obese female subjects were investigated.

**Material and Methods:** Fifty-one female obese subjects were recruited and categorized into quartiles according to their body mass indexes (BMI). Prior to periodontal intervention plasma samples

were obtained and full-mouth clinical periodontal measurements were recorded at 6 sites/tooth. ELISA was used for the biochemical analysis. Data were tested statistically.

**Results:** BMI showed a positive correlation with HbA1c, plasma leptin levels (p

**Conclusion:** In conclusion, within the limitations of this study, obesity does not seem to have a significant influence on clinical periodontal findings but does have many correlations with plasma inflammatory and acute phase molecules. A prospective study should be designed to better clarify the effects of obesity on periodontal health.

Topic: Basic Research: Aetiology and Pathogenesis

## P0610

### Real-time cell analysis of BMP-2, 6 and 7 on the human periodontal ligament stem cells (hPDLSCs)

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<sup>1</sup>Konya/Turkey, <sup>2</sup>Kocaeli/Turkey

**Aim:** BMPs play an important role in regulating cell behavior required for regeneration of the dental tissues. The purpose of this study was to evaluate the effects of BMP-2, 6 and 7 on the proliferation of human periodontal ligament stem cells (hPDLSCs)

**Material and Methods:** hPDLSCs were obtained from periodontal ligament tissue of human impacted third molar. Real Time-Cell Analyzer (RT-CA; xCELLigence system) was used to evaluate cell proliferation. After seeding 200 µL of the cell suspensions into the wells (5.000 cells/well) of the E-plate 96, hPDLSCs were treated with DMEM containing different concentrations of BMP-2, 6 and BMP-7 (10, 25, 50, 100 ng/ml) and monitored every 15 min for a period for 190 hrs.

**Results:** Results demonstrated that at short term there was no significant change in BMP-2, 6 and 7 treatments when compared to untreated control group. At long term (after 110 hrs) while BMP-2 and BMP-7 still have no additive effects on the proliferation of hPDLSCs, only 50 ng/ml of BMP-6 increased cell index of hPDLSCs (p<0.05) at 135 hours when compared to control.

**Conclusion:** In general, BMPs didn't have significant effect on the hPDLSCs proliferation except BMP-6. Since BMPs regulate differentiation of the cells, further experiments should be performed to check differentiation of hPDLSCs (Supported by TUBITAK-SBAG/110S415 and Research Coordination Office of Selcuk University-BAP).

Topic: Basic Research: Aetiology and Pathogenesis

## P0611

### Comparison of transient receptor potential vanilloid 1 (TRPV1) and transient receptor potential ankyrin1 (TRPA1) receptor expression in oral lichen planus

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Pécs/Hungary

**Aim:** OLP is an inflammatory disorder of the oral mucosa. It is supposed that neurogenic components participate in the disease.

Inflammatory mediators can activate sensory nerves via TRP channels and lead to the release of pro- and anti-inflammatory neuropeptides. Recently, TRPV1 receptors have been identified on non-neural cells such as immune and inflammatory cells. Non-neuronal TRPA1 channel is expressed by epidermal, dermal, epithelial, mucosal but not immune cells. We aimed to detect the existence of TRPV1 and TRPA1 receptors and non-neural expression of their mRNA in OLP.

**Material and Methods:** EnVision kit was used for immunohistochemical preparations. qRT-PCR was performed on a Roche Light Cycler sequence detection system by TaqMan primers and probes following TaqMan universal PCR master mix protocol. As internal controls, transcripts GUSB and HPRT1 were determined.

**Results:** We have presented immunohistochemical evidence that expression of TRPV1 receptors increases in OLP compared to the normal mucosa. Increased specific immuno-positivity was observed in the epithelium, the vascular endothelial cell, lymphocytes and fibroblasts. The local expression of these extraneural TRPV1 receptors was proven also on the level of mRNA using quantitative RT-PCR. Expression of TRPA1 receptors remained unchanged in the lichen planus by immunohistochemical markers and qRT-PCR.

**Conclusion:** On the basis of the present study, it is supposed that extraneural TRPV1 receptors might participate in the pathomechanism of OLP.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0612

#### Interactions of compounds from selected chewing stick sources with *Aggregatibacter actinomycetemcomitans*

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**Aim:** *Aggregatibacter actinomycetemcomitans* produces a leukotoxin that activates a pro-inflammatory death of human monocytes/macrophages. A specific clone of this bacterium (JP2) has a 530-base pair deletion in the leukotoxin promoter gene that causes a significantly enhanced expression of leukotoxin. This specific clone of *A. actinomycetemcomitans* is common in some African populations and has a strong association with periodontal attachment loss in adolescents in these populations. Chewing sticks of plant origin are commonly used for oral hygiene in Africa, but their role as a therapeutic agent in periodontal disease is poorly investigated.

**Material and Methods:** Ethanol extracts were made from 7 common plants used as chewing sticks in West-Africa. These extracts were examined for possible biological activity against *A. actinomycetemcomitans* growth and leukotoxicity.

**Results:** None of the tested extracts inhibited growth of *A. actinomycetemcomitans*. However, extracts from *Psidium guajava* (Guava) completely neutralized the cell death and pro-inflammatory response of human leukocytes induced by the leukotoxin. None of the six other tested chewing stick extracts showed this effect.

**Conclusion:** The discovery that extracts from Guava efficiently neutralizes *A. actinomycetemcomitans* leukotoxicity might lead to novel therapeutic strategies for treatment of aggressive forms of periodontitis induced by infections with the highly leukotoxic clone of this bacterium.

## Topic: Basic Research: Aetiology and Pathogenesis

### P0613

#### Fluorescence of *Aggregatibacter actinomycetemcomitans*

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**Aim:** To investigate red fluorescence emission from *Aggregatibacter actinomycetemcomitans*.

**Material and Methods:** The *A. actinomycetemcomitans* strain ATCC 33384 serotype c was cultured for 12 days at 37° C in a 5% CO<sub>2</sub> atmosphere on Trypticase Soy agar with Bacitracin and Vancomycin (TSBV) and on Columbia agar with 5% defibrinated horse blood. Quantitative Light-Induced Fluorescence was used for monitoring red fluorescence emission, and a digital camera obtaining white light images. ANOVA with Bonferroni corrected t-tests and linear regression were used for statistical analyses using the WinStat 3.0 statistical software.

**Results:** *A. actinomycetemcomitans* exhibited red fluorescence with an intensity time trend following the typical physical bacterial growth trend on substrate plates observed in white light, with a maximum at day seven post inoculation. Statistical analysis showed a significant red fluorescence increase at day seven of the bacterial growth period. It was also shown that it was necessary to grow the *A. actinomycetemcomitans* on blood agar substrates in order to obtain red fluorescence from the bacterium colonies. These results are in contrast to the predominant hypotheses that mainly black-pigmented anaerobes are responsible for red fluorescence, and that it is the complex of mature biofilm rather than single bacterium species that is responsible for red fluorescence emission.

**Conclusion:** To our knowledge this is the first study showing that a single gram-negative capnophilic bacterium strain, in this case *A. actinomycetemcomitans*, exhibit red fluorescence on its own. A possible clinical implication could be the use of photodynamic therapy as an alternative for killing *A. actinomycetemcomitans*.

## Topic: Diagnosis and Risk factors

### P0614

#### A survey of type and outcome of referrals to periodontists in Damascus – Syria

M. Kadhim, L. Jodah, L. Saeed, K. Hadad

Daraa/Syria

**Aim:** To study the type of referrals and the outcome of these referrals to periodontists in Damascus, Syria.

**Material and Methods:** Syrian periodontists working in public and private clinics in Damascus city were invited, and 43 of these agreed to participate in this study. Data were collected using a self-administered questionnaire that gathered information about the demographics of referred patients, the diagnosis and severity of the disease or condition pertaining to the referral, treatment procedures performed, and specialist's assessment of the treatment outcome.

**Results:** 76.7% of the periodontists received referrals of periodontal patient regularly. 79.1% of the referred patients had chronic periodontitis, and 55.8% of the referrals were advanced cases that were challenging to treat. 60.5% of the patients were males, and 81.4% had localized gingival recession on posterior teeth. 53.5% of periodontists use surgical methods regularly to treat chronic periodontitis, and 27.9% use various bone grafts. 79.1% of periodontists used hand and ultrasonic devices for scaling and root planing, while only 14% used mainly hand instruments.

**Conclusion:** The referral pattern of periodontal patients by general dentists to periodontists in Syria is inadequate. Either the dentists are missing early disease, or they may be waiting too long to refer these cases.

## Topic: Diagnosis and Risk factors

### P0615

#### Assessment of oral health and health behavior among students of the international university for science and technology in Syria.

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Daraa/Syria

**Aim:** To assess the reflection of knowledge acquired in dental care and to determine the oral health attitudes and behavior differences among male/ female dental students at the international university for science and technology (IUST).

**Material and Methods:** A total of 250 students from all academic years (125 males and 125 females; 19-24 years of age) were clinically examined to assess the attachment loss, plaque level, and bleeding on probing at 6 sites per tooth. Information about oral health knowledge was gathered by an interview using a structured written questionnaire. An independent examiner performed all clinical examinations.

**Results:** The presence of plaque and bleeding on probing was significantly less for the student groups after the third academic year ( $p=0.001$ ). Only 26% of students chose to visit dental clinic to treat gingival bleeding, while only 15% visit dental clinics regularly. The rates of using tooth brush was higher in females compared to males, 35% of males used tooth brush less than 2 times per day compared to 13% females ( $p=0.07$ ). Female students believe more in the benefit of using hard tooth brush than male students; but smoking was much more frequent among males ( $p=0.03$ ).

**Conclusion:** Improvement of oral hygiene status was related to dental education experience, and oral hygiene knowledge can be considered as a risk indicator for gingival disease.

## Topic: Diagnosis and Risk factors

### P0616

#### IL-1 polymorphisms may predict unsuccessful dental implants?

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**Aim:** The aim of this study was to analyse the possible association between no success of dental implants and two polymorphisms, IL1A (-889) and IL1B (+3953), in a Caucasian Portuguese population, and a possible relationship with other potential risk variables associated with a peri-implant disease.

**Material and Methods:** 155 unrelated Caucasian individuals, were divided into 2 groups: 100 with successful dental implant rehabilitations and 55 with unsuccessful ones. To identify the polymorphisms, in positions -889 of IL1A gene and +3953 of IL1B gene, was performed an oral mucosa scraping of the patients and the DNA obtained from epithelial cells. The data were analysed in the SPSS Statistics 17.0® and the statistic analysis included the independence test of the chi-square, the exact test of Fisher and techniques of analysis of binary logistic regression.

**Results:** The estimated prevalence of polymorphisms of IL1A and IL1B gene, determined by the TGP (CGC Genetics, Portugal) results, in the Caucasian Portuguese population was of 33.5%.

Success of rehabilitation with dental implants was more associated to a negative TGP result, whereas failure was found to be related to a positive result. Tobacco and alcohol consumption showed no statistically significant association with success or no success of the dental implants.

**Conclusion:** The success of the dental implants was more associated with the presence of the allele 2 of the IL1A gene and the allele 2 of the IL1B gene.

Tobacco and alcohol consumption showed no association with success or no success of the rehabilitation with dental implants.

## Topic: Diagnosis and Risk factors

### P0617

#### Smoking and nicotine addiction negatively influence non surgical periodontal treatment results at long term

T. Boulaamaim, O. Huck, H. Tenenbaum, J. Davideau  
Strasbourg/France

**Aim:** Cigarette smoking is a well-evidenced risk factor for periodontitis. However, its influence on periodontal treatment outcomes is not clearly established. The choice of smoking and periodontitis definition, and treatment modalities apparently modify study results and conclusions. Our aim was to evaluate the long term effects of cigarette consumption and nicotine addiction on periodontal therapy in a case-control study.

**Material and Methods:** Twenty non-smoker (NS) and twenty smoker (S) patients suffering from severe periodontitis were re-examined 1 to 5 years after initial diagnosis and non surgical periodontal treatments. The Fagerström's nicotine addiction score was also evaluated at re-examination. Periodontal treatment effectiveness was assessed by measuring pocket probing depth (PPD) changes and number of tooth loss per year (TL).

**Results:** At base-line, patients of NS and S groups did not differ by their demographic, periodontal and treatment characteristics. During the 3 years mean follow-up period, global PPD improvement was 1.07 and 0.78 mm for NS ( $p<0.001$ ) and S groups ( $p=0.002$ ), respectively. However, the percentage of PPD>7mm on molars did not change significantly ( $p=0.24$ ) in

smokers during treatment, especially in patients smoking more than 10 cigarettes/day ( $p=0.35$ ). The percentage of sites with a PPD increase  $>2\text{mm}$  was significantly higher ( $p<0.03$ ) in smoker. The mean TL was related to the Fagerström's score but not to the cigarettes/day number.

**Conclusion:** Our results indicated that cigarette consumption and nicotine addiction levels influenced negatively but differentially periodontal treatment outcomes in patients suffering from severe periodontitis. These two aspects of smoking should be considered before treatment.

## Topic: Diagnosis and Risk factors

### P0618

#### SALIVARY MARKERS OF TYPE I COLLAGEN DEGRADATION IN PERIODONTITIS

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**Aim:** Type I collagen is the major organic compound in bone and connective tissue. The present aim was to evaluate the levels of type I collagen breakdown products and related enzymes from periodontitis subjects.

**Material and Methods:** Salivary specimens originated from 230 subjects with at least 20 teeth; 84 subjects had advanced periodontitis (AP; at least 14 teeth with probing pocket depth (PPD)  $\geq 4\text{ mm}$ ), 65 of the subjects had localized periodontitis (LP; two subgroups; 2 or 7 teeth with PPD  $\geq 4\text{ mm}$ ) and 81 subjects with PPD  $< 4\text{mm}$ (control). Matrix metalloproteinase (MMP)-8, -13, tissue inhibitor of metalloproteinase (TIMP)-1, tartrate-resistant acid phosphatase (TRACP)-5b, and carboxy-terminal and aminoterminal cross-linked telopeptides of type I collagen (ICTP, CTX, NTX) were measured.

**Results:** Salivary levels of MMP-13, TIMP-1, and CTX were significantly higher (for all markers  $p<0.001$ ) in the LP groups than those in the control and AP groups. Salivary levels of TRACP-5b, and NTX were significantly lower in the LP groups than those in the control (for both markers  $p=0.04$ ) and AP groups ( $p=0.008$  and  $p<0.001$ , respectively). Salivary levels of MMP-8 and ICTP were significantly higher in the LP groups (for both markers  $p<0.001$ ) and reached their highest levels in the AP group (for both markers  $p<0.001$ ), in comparison with those of the control group.

**Conclusion:** The pattern of salivary type I collagen breakdown products and enzymes producing them differ in LP and AP, which may be attributed to variances in their regulation in diverge disease stages.

## Topic: Diagnosis and Risk factors

### P0619

#### Implant diagnostics: The impact of molecular biomarkers. Case report of peri-implantitis, peri-mucositis and healthy implant present in the same patient

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**Aim:** To investigate the potential impact of bone biomarkers in monitoring of peri-implant tissues.

**Material and Methods:** The 58 years old postmenopausal, non-smoker and systemically healthy female patient with diagnosed early stage peri-implantitis and peri-mucositis and with one healthy implant was a subject of the study. All implants were positioned in the  $\pm 4$  months interval, and loaded at least 2 years before the study. Peri-implant crevicular fluid (PICF) was collected around implants for evaluation of soluble receptor activator nuclear factor kappa-b ligand (sRANKL), osteoprotegerin (OPG), cathepsin-K and sclerostin using enzyme linked immunoassay (ELISA). Obtained results were compared with findings achieved by other diagnostic procedures and their correlations were interpreted. Performed diagnostic procedures included: clinical measurements, radiological diagnostics, occlusal markers and t-scan analysis.

**Results:** Measured biomarkers showed distinguishing values between healthy implant, peri-mucositis and peri-implantitis with the exception of sclerostin. Amongst the measured biomarkers, only sRANKL and OPG values showed compatibility with findings of the other four performed diagnostic procedures.

**Conclusion:** Determination of bone biomarkers in PICF seems to be a promising non invasive procedure in monitoring of peri-implant tissues condition.

## Topic: Diagnosis and Risk factors

### P0620

#### Is The Vertical Dimension of Bone Affected by Loaded Implants?

S. Via, A. Klinger

Jerusalem/Israel

**Aim:** To examine whether loaded implants assist in preserving the vertical dimension of alveolar bone.

**Material and Methods:** A search in the database of the Faculty of Dental Medicine of the Hebrew University and Hadassah Jerusalem yielded 3610 patients who had two sequential panoramic x-ray performed six months apart or more between January 2006 to December 2009. Only 13 patients matched the selection criteria as follows: 1) healthy 2) nonsmoker 3) had two sequential panoramic x-ray performed six months apart or more, with two loaded implants or more(test), or an alveolar ridge with two missing teeth or more(control).

Measurements of the bony ridges using the sequential x-rays in patients with implants(test) were compared to patients with ridges



without implants(control). The measurements were performed by two experienced calibrated periodontists.

**Results:** The results show that there is very little bone loss in the vertical dimension over time in both groups. No differences were found in the vertical bony dimensions of two sequential x-rays in the test versus control.

**Conclusion:** With the proper preservation due to the limited number of patients matching the inclusion criteria, it seems that loaded implants do not affect the vertical dimension of the alveolar bone over time.

## Topic: Diagnosis and Risk factors

### P0621

#### Aging influences positively and independently non surgical periodontal treatment results

S. Bersuder, M. Leininger, H. Tenenbaum, J. Davideau  
Strasbourg/France

**Aim:** Aging is considered for a long time as a major risk factor of periodontal diseases. However, the age-related effect on periodontal treatment effectiveness remains controversial because of its association to numerous confounding factors, including periodontitis diagnosis, smoking, or diabetes exposition duration. Our aim was to evaluate the independent effect of age on non surgical periodontal treatment results using a case-control study.

**Material and Methods:** Twenty mid-aged patients (MA) from 40 to 54 years-old and twenty aged patients (A) from 55 to 70 years-old suffering from moderate chronic periodontitis were re-examined 1 to 6 years after initial diagnosis and non surgical periodontal treatments. Periodontal treatment effectiveness was assessed by measuring pocket probing depth (PPD), bleeding on probing (BOP) changes and number of tooth loss per year (TL).

**Results:** At base-line, demographic (except age), periodontal and treatment characteristics were similar on both groups. During the mean follow-up period of 3.5 years, mean PPD reduction was 0.27 and 0.6 mm for MA ( $p=0.05$ ) and A groups ( $p<0.0001$ ), respectively. PPD reduction was significantly higher in A group ( $p=0.005$ ), and was related to age ( $p<0.01$ ). BOP decrease was similar in both groups (MA: 19%, A: 17%). The mean TL during study period was 0.08 for MA group and 0.18 for A group.

**Conclusion:** These data showed that age could not be considered as a risk factor for non surgical periodontal treatments. The improvement of periodontal conditions in aged patients compared to younger patients suggested that aging may positively modify periodontal tissue response to treatment.

## Topic: Diagnosis and Risk factors

### P0622

#### A simplified algorithm and classification for patient centric periodontal treatment planning based on indian population.

P.J. Kapadia  
Daman/India

**Aim:** To design and evaluate an algorithm and a classification for patient centered treatment planning for save/extract decisions in periodontitis in an Indian population.

**Material and Methods:** A simple periodontal classification system was devised during initial treatment planning of the patients diagnosed with chronic or aggressive periodontitis. Another algorithm was devised for decisions of prognosis and treatment plan, which was used as a guidance tool for making tooth preservation/ extraction decisions. The index system assigned numerical values to number of pockets  $> 5$  mm, Number of teeth with mobility and Number of teeth with bleeding on probing. The algorithm used simple criteria of mobility, pain and bleeding to decide whether the tooth should be salvaged or extracted. This was evaluated on a 100 consecutive patients using periodontal charts and OPGs as guidelines for a minimum of 1 year, and a maximum of 4 years in a private clinic by a single qualified examiner (PK).

**Results:** The algorithm was reliable in predicting tooth survival, and patient satisfaction. The classification index system was found easy to apply but less reliable in predicting future changes, owing to the short span of the study. The major advantage of the classification was ease of communication to the patient and referring dentist, and ease of record-keeping at recall.

**Conclusion:** Despite to uncertainty of periodontal prognosis, especially in poorly maintained patients, an algorithm based on tooth mobility and pain functions as accurately as one which includes many other parameters. The classification, though less reliable, may be helpful in increasing compliance in recall.

## Topic: Diagnosis and Risk factors

### P0623

#### ENDO-PERIO LESIONS – Which teeth can be saved?

M. Marotti, C. Pertl, M. Lorenzoni, G. Wimmer  
Graz/Austria

**Aim:** Dental Implants have become a foremost technique in dentistry. Numerous innovations concerning materials, computer technology and strategies are responsible for a highly sophisticated treatment approach. All this is questioning some of the tooth saving dental techniques. In particular, this is true for teeth with combined endodontic and periodontal lesions.

Nevertheless, saving teeth still is the priority aim of our professional ethics, although new aspects such as the preservation of alveolar bone and a healthy oral microflora have become important factors for the decision making of our treatment plans.

**Material and Methods:** Concerning Endo-Perio lesions it is most critical to differentiate between primary endodontic lesions with secondary periodontal involvement or advanced periodontal infection with secondary endodontic disease. In the former case the prognosis is reliably good in the latter case the extraction of the tooth is usually indicated.

**Results:** Different clinical solutions will be presented in order to discuss prognosis, costs, technical skill and general requirements. In general, the function of a tooth depends primarily on the health of the periodontium and not so much on the vitality of the dental pulp.

**Conclusion:** As we are moving posterior along the dental arch both endodontic and periodontal treatment techniques are becoming

more complex and the prognosis is more uncertain. Almost just the opposite the matter stands with implants where the aesthetic demands in the anterior region often require sophisticated measures.

This presentation will focus on the necessary balance between the individual demands of our patients and the realistic and predictable treatment options.

Topic: Clinical Research: Diagnosis and risk factors

## P0624

### Comparing clinical parameters and antioxidant capacities between healthy and severe periodontitis patients

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Istanbul/Turkey

**Aim:** Periodontal disease is a chronic inflammatory disease characterized by connective tissue breakdown and alveolar bone loss. The limitations of traditional methods became clear, now techniques have been proposed as diagnostic tests for periodontal disease. The aim of this study is to compare clinical parameters and total antioxidant capacity (TAOC) of saliva and serum between healthy and periodontitis patients.

**Material and Methods:** Our study consist of 86 systemically healthy subjects. 56 severe periodontitis subjects; consists of 34 chronic periodontitis (CP), 22 aggressive periodontitis (AP) and 30 healthy subjects. Clinical data included probing depth (PD), bleeding on probing (BOP), gingival index (GI), plaque index (PI) were recorded at six sites per tooth. After these clinical measurements, saliva and blood samples were collected.

**Results:** The clinical results of the test group were, PI: 0,79±0,15; GI: 1,6±0,26; PD: 3,29±0,47; and BOP: 0,79±0,14 and the results of the control group were; PI: 0,31±0,09; GI: 0,84±0,48; PD: 1,7±0,45; BOP: 0,48±0,12. TAOC of serum is 0,176±0,111 in CP subjects and 0,195±0,086 in AP subjects. The results of the control group is 0,267±0,132. TAOC of saliva is 0,195±0,124 in CP subjects; 0,204±0,063 in AP subjects and control group is 0,197±0,180. The clinical results of the test group were higher than the control group as expected. The antioxidant capacity of serum was significantly lower in the periodontitis group than it was in the controls ( $p < 0,08$ ). Saliva antioxidant levels between groups were not statistically significant ( $p < 0,946$ ).

**Conclusion:** Observing lower serum antioxidant capacity of periodontitis patients might be a result of periodontal disease. However extended studies with larger populations are necessary.

Topic: Clinical Research: Diagnosis and risk factors

## P0625

### The composition of the main periopathogens: Porphyromonas gingivalis, Tannerella forsythia, Treponema denticola and Aggregatibacter actinomycetemcomitans of patients with alcoholic disease and chronic periodontitis. A pilot study.

A. Sender-Janeczek, N. Stawińska, M. Ziętek  
Wrocław/Poland

**Aim:** The aim of this study was to evaluate the composition of the main periopathogens: Porphyromonas gingivalis, Tannerella forsythia, Treponema denticola and Aggregatibacter actinomycetemcomitans of patients with alcoholic disease and chronic periodontitis.

**Material and Methods:** The study was conducted with 30 alcoholics of the Department of Alcohol Addiction Closed Treatment and 30 non-alcoholic patients of Periodontology Department of Medical University in Wrocław. Subgingival biofilm samples were obtained from 4 deepest sites. The presence of 4 bacterial taxa were analysed using the PCR technique.

**Results:** The prevalence of bacterial species was significantly different between groups. Alcoholics showed significantly higher mean DNA counts of Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis and Treponema denticola. No difference between groups was observed in mean DNA counts of Tannerella forsythia. The microbiological results showed no statistically significant association between the amount of alcohol and composition subgingival flora in patients suffering from alcoholism.

**Conclusion:** Alcoholics presented a microbiological characteristic for periodontal disease. Patients suffering from alcoholism harboured significantly higher levels of periodontopathic species in the subgingival microbiota than non-alcoholics. There was no significant association between the amount of alcohol and subgingival flora.

Topic: Clinical Research: Diagnosis and risk factors

## P0626

### saliva and serum total antioxidant capacity in health and periodontitis subjects

G. Ateş, U. Baser, M. Keskin, G. Işık  
Istanbul/Turkey

**Aim:** Periodontal diseases are associated with increased oxidative stress and lower antioxidant levels. However, it is not clear the decreased levels of antioxidants whether the effect or the cause of the periodontal disease. The aim of this study was to evaluate the effect of non-surgical periodontal treatment on the levels of saliva and plasma total antioxidant capacity (TAOC) levels of periodontitis patients.

**Material and Methods:** A total of 34 non-smoking subjects were included in the study. Test group consisted of generalized advanced chronic periodontitis according to 1999 AAP workshop. Control group consisted of seventeen healthy subjects. All subjects were systemically healthy and between 30-50 years old. Test group were received initial periodontal treatment. Unstimulated saliva and blood samples were collected (after overnight fasting) at baseline, 2 and 6 months after the periodontal treatment of test group. Samples were collected once for control subjects. Total antioxidant capacity (TAOC) were measured by the trolox equivalent antioxidant assay.

**Results:** Baseline, 2 and 6-month saliva antioxidant concentrations were lower in the periodontitis subjects compared to control subject, but it was not statistically significant ( $p=0.677$ ,  $p=0.298$ ,  $p=0.641$ ). Baseline and 2-month plasma antioxidant concentrations were lower in the periodontitis subjects compared to control subjects ( $p=0.326$ ,  $p=0.866$ ). 6-month plasma antioxidant concentration was higher in the periodontitis subjects compared to control subjects ( $p=0.688$ ).

**Conclusion:** We conclude that, the low antioxidant levels found in periodontitis subjects might be the result of periodontal disease and could be restored to the control subject levels with proper periodontal treatment.

Topic: Clinical Research: Diagnosis and risk factors

## P0627

### CASE REPORT: ORAL MANIFESTATION OF APERT SYNDROME

D. Özkal, G. Ünal Kocaman, E. Kermen, V. Canakci  
Erzurum/Turkey

**Aim:** Apert syndrome (acrocephalosyndactyly) is an autosomal dominant disorder. Syndrome is rare developmental malformation characterized by craniosynostosis, mid-face hypoplasia, symmetrical syndactyly of hands and feet. The prodromal characteristics for the typical cranio-facial appearance are early craniosynostosis of coronal suture, cranial base and agenesis of the sagittal suture.

**Material and Methods:** An eleven years old male patient present with several craniofacial deformities, including brachycephaly, midface hypoplasia, hypertelorism. Osseous fusion of the hands and feet were also observed. Intraoral findings included delayed eruption of teeth, high arched palate with pseudo cleft in the posterior one third, anterior open-bite, tooth agenesis, enamel hypoplasia, tooth displacement, pseudoprognathic appearance is basically due to maxillary retroposition and dental caries depended on inadequate oral hygiene.

**Results:** Children with Apert syndrome have obvious dysmorphic facial growth, particularly affecting the midface. The need for corrective surgery, therefore, is inevitable. There will be challenges because of anomalies in the morphology of the teeth, crowding and delayed eruption. Treatment of these patient is done by multidisciplinary team.

**Conclusion:** Dental plaque on the teeth was removed. Oral hygiene practice was given to the child and –especially– his parents and they guided to pedodontist, orthodontist and surgeon to ensure successful planning and optimal treatment outcomes for patient.

Topic: Clinical Research: Diagnosis and risk factors

## P0628

### GIANT HEMANGIOMA OF TONGUE

D. Özkal, E. Kermen, G. Ünal Kocaman, V. Canakci  
Erzurum/Turkey

**Aim:** Lingual hemangioma (LGH) is a commonly encountered benign lesion in the oral cavity, that mostly occurs in the tongue of adolescences. Haemangiomas are developmental vascular abnormalities and more than 50% of these lesions occur in the head and neck region, with the tongue, buccal mucosa, lips and palate most commonly involve. Hemangioma of tongue is rare.

**Material and Methods:** A twenty-six years old male patient has hemangioma of lateral of tongue. The lesion create clinical problems consisting, due to majority of case, chewing, speaking

and difficulties of toothbrushing. The patient had necessary examinations and there is no symptoms, such as bleeding, airway obstruction, thrombocytopenia, infection or cardiovascular problems, so no need to surgery.

**Results:** Enflammation due to inadequate oral hygiene may aggravate the clinical table. Dental plaque on the teeth was removed. Oral hygiene practice was given to the patient. We follow up the patient intervally to take hygiene under control.

**Conclusion:** LGH can diagnosed by carefully observation and examination by periodontist at clinic.

Topic: Clinical Research: Diagnosis and risk factors

## P0629

### EVALUATION OF PERIODONTAL PARAMETERS IN PATIENTS WITH FAMILIAL MEDITERRANEAN FEVER

V. Bostancı, H. Toker, S. Şenel  
Sivas/Turkey

**Aim:** Familial Mediterranean fever (FMF) is a self-limiting autosomal recessive disorder. The symptoms include recurrent attacks of fever and inflammation with peritonitis, pleuritis, synovitis, and erysipelas-like skin lesions. The aim of this study is to compare oral findings in FMF patients with systemic healthy controls.

**Material and Methods:** 84 patients (68 female, 16 male–mean age: 32.21±1.23), diagnosed with FMF who applied from Cumhuriyet University Faculty of Medicine Rheumatology Department to Faculty of Dentistry Periodontology Department and 75 systemic healthy controls (59 female, 16 male, mean age: 30.93±1.22) were included in this study. DMFT values, plaque index (PI), gingival index (GI), probing depth (PD), clinical attachment level (CAL), radiographic findings were evaluated.

**Results:** In the end of the study statistical analyses showed no significant differences DMFT values among groups ( $p>0,05$ ). PI and GI were significantly higher in the FMF group than control group. PD and CAL values were found statistically lower in FMF group than control ( $p<0,05$ ).

**Conclusion:** FMF patients can be more susceptible to periodontal diseases than the control group because of higher GI and PI values. Patients should receive dental treatments when necessary and be motivated to have an optimal oral hygiene.

Topic: Clinical Research: Diagnosis and risk factors

## P0630

### Obesity and periodontal disease in children

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<sup>1</sup>Naples/Italy, <sup>2</sup>Cagliari/Italy

**Aim:** The objective of this study was to identify the possible association between periodontal disease and body mass index (BMI) and examine the relationship between lifestyle and periodontal condition in children.

**Material and Methods:** A sample of 27 patients (15 males and 12 female) aged between 7 and 16 years from the Eating

Disorders Department of the Paediatric Clinic at the Second University of Naples were examined and interviewed. Data were entered in a specifically created periodontal file.

The study was structured in three steps: 1) administration of a questionnaire on lifestyle, eating habits and oral hygiene; 2) periodontal check-up with a WHO probe to assess tissue inflammation, oral hygiene and the plaque index (FMBS and FMPS); 3) oral hygiene motivation at home.

**Results:** The questionnaire responses showed some particularly widespread poor eating habits, such as excessive consumption of sweets, fizzy drinks and low intake of fruit and vegetables. This is the results of a sedentary lifestyle, with little sport and many hours spent watching TV. Clinical examination showed an increase in gingival inflammation and plaque in children with high BMI. In all patients undergoing the check-up, significant improvements were observed in the two periodontal indexes, FMBS and FMPS, after oral hygiene was motivated at home.

**Conclusion:** Since not all children are able to successfully perform oral hygiene manoeuvres and follow a proper diet, the role of dental hygienists is crucial.

Topic: Clinical Research: Diagnosis and risk factors

P0631

### The accuracy of cone beam computed tomography in assessing molar furcation involvement

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Beijing/China

**Aim:** The aim of this study was to investigate the accuracy of dental CBCT in assessing FI in maxillary and mandibular molars.

**Material and Methods:** 17 lower molars and 21 upper molars with 93 furcation involvements diagnosed by probing those needed periodontal surgery were included. The furcation defects were diagnosed and measured by CBCT before surgery and by probing during surgery. The results of diagnosis and related parameters obtained from the three methods were compared.

**Results:** All of the furcation involvements could be shown in CBCT images. The Kappa value was 0.917 in maxillary molars and 0.986 in mandibular molars. The complete agreement percentage was 85.2% and 90.6%. There was no significant difference between 5 parameters measured by CBCT and probing in the surgery: the vertical and horizontal depth of bone defects and the furcation involvements, and the width of the furcation ( $P > 0.05$ ). The other 2 parameters were underestimated by CBCT ( $P < 0.05$ ): the distance between furcation and the alveolar bone in maxillary molars, and horizontal maximum destruction.

**Conclusion:** CBCT enhanced the diagnosis accuracy of furcation involvements, especially for distal sites of upper molars. Compared with probing and radiographs, CBCT provided more information and details in furcation involvements, such as the 3-D datas, the configurations of defects, and the length of root trunk, which were useful in treatment planning, prognosis, and evaluating the outcomes of therapy. The maximum measurements in 3-D dimentions were recommended in clinical applications.

Topic: Clinical Research: Diagnosis and risk factors

P0632

### A retrospective analysis of influence of the glycemic controlled on periodontal disease severity

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**Aim:** The aim of this study therefore was to compare the severity of periodontal disease in amongst controlled diabetics and healthy individuals.

**Material and Methods:** Records of patients diagnosed with chronic periodontitis were retrieved from the periodontal referral database of June 2006 to June 2008. Clinical records such as medical history details and periodontal parameters were documented and compared between diabetic and non-diabetic patients. SPSS Statistical package was used to compare the differences.

**Results:** The sample comprised of 70 diabetics and 72 healthy non-diabetic individuals. There were no significant differences in the gender, age and ethnicity between the two groups. Up to 95% of diabetic patients stated that their glyceamic levels were controlled by medications. Diabetic patients had more tooth loss ( $p < 0.009$ ) and 9.45% less healthy sites as compared to non-diabetics. Mean probing pocket depth of diabetic and non-diabetic patients in this sample were  $3.26 \pm 1.2$  and  $3.21 \pm 0.97$  respectively.

**Conclusion:** In this study, it was found that the periodontal disease severity is similar to both controlled diabetic and non-diabetic groups. Though, diabetics groups have shown more tooth loss.

Topic: Clinical Research: Diagnosis and risk factors

P0633

### Specific and sensitive hmuY-based primers and real-time PCR for identification of Porphyromonas gingivalis

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**Aim:** Chronic periodontitis is an infectious disease to which genetic, microbial, immunological, and environmental factors combine to influence disease risk and progression, resulting in the destruction of tooth-supporting tissues. Porphyromonas gingivalis, a major etiological agent in the development and progression of this disease, acquires heme from host hemoproteins using a novel HmuR-HmuY system. The amino-acid sequence of HmuY shows low similarity (5-47%) to sequences found in other species and is unique among P. gingivalis strains. The aim of this study was to develop a diagnostic marker based on the hmuY gene sequence for P. gingivalis identification.

**Material and Methods:** Samples were collected from 56 patients with advanced chronic periodontitis and 40 healthy individuals. Evaluation of periodontium was carried out using the assessment of the Approximal Plaque Index (API%), Sulcus Bleeding Index (SBI%), Clinical Attachment Level (CAL), and the depth of



periodontal pockets. Subgingival plaque samples were obtained from the deepest periodontal pockets (5-12 mm). Genomic DNA was isolated and quantitative real-time PCR was performed using SYBR Green and specific hmuY-based primers. The entire hmuY sequence was also amplified using PCR and sequenced.

**Results:** Primers designed to the hmuY gene sequence were highly sensitive and specific, as compared with other primers used routinely for *P. gingivalis* identification. *P. gingivalis* was detected in the majority of patient samples (76%). Analysis of hmuY gene sequence demonstrated high homology in all samples examined.

**Conclusion:** Primers developed in this study may be used for rapid, specific and sensitive detection of *P. gingivalis* in human samples.

Topic: Clinical Research: Diagnosis and risk factors

## P0634

### Retrospective correlation of clinical and radiographic parameters in patients with aggressive periodontitis

M. Beldoch, N. Zimmermann, F. Ghannad, A. Lawo, D. Hagenfeld, T.S. Kim

Heidelberg/Germany

**Aim:** The aim was to compare the radiographic profile of patients suffering from aggressive periodontitis treated and maintained in the Section of Periodontology at the University Hospital Heidelberg between 1997 and 2002. Radiographic parameters were considered and compared between the localized and generalized forms.

**Material and Methods:** Total data of 117 patients (aged 18 – 35) were included. According to the AAP Classification from 1999 we replaced “early onset periodontitis” with “aggressive periodontitis”. We assigned all patients with more than two teeth with pocket depths  $\geq 6$  mm besides first molars and incisors to the group of generalized form of aggressive periodontitis, those with two or less teeth besides first molars and incisors were assigned to the group of localized form of aggressive periodontitis. Data includes pocket probing depths at 6 sites per tooth and radiographs (orthopantomogramm). Measurement of the underlying radiographic bone loss was performed with a Schei – ruler at all teeth present. Bone loss was determined as percent of root length nearest to 5 %.

#### Results:

	n = 117	LagP (n=32)	GagP (n=85)
1	Mean pocket depth	3.10 +/- 0.43	4.07 +/- 0.74
2	Mean bone loss in % overall dentition	22.48 +/- 7.98	32.99 +/- 13.65
3	Bone loss index	1.34 +/- 0.63	2.04 +/- 0.73
	Correlation between 2 and 3 (Kendall tau)	.395 (p=.003)	.342 (p=.000)

**Conclusion:** Patients suffering from a generalized form of aggressive periodontitis showed deeper mean pocket depths, a higher percentage of mean bone loss and a higher bone loss index. This may be attributable to the comparably small number of patients.

Topic: Clinical Research: Diagnosis and risk factors

## P0635

### Retrospective correlation of clinical and microbiological parameters in patients with aggressive periodontitis

N. Zimmermann, M. Beldoch, F. Ghannad, A. Lawo, T.S. Kim

Heidelberg/Germany

**Aim:** The aim was to compare the profile of patients suffering from aggressive periodontitis treated and maintained in the Section of Periodontology at the University Hospital Heidelberg between 1997 and 2002. Clinical and microbiological parameters were considered and compared between the two diagnoses.

**Material and Methods:** In total data of 117 patients (aged 18 – 35) were included. According to the AAP Classification from 1999 we replaced “early onset periodontitis” with “aggressive periodontitis”. We assigned all patients with more than two teeth with pocket depths  $\geq 6$  mm besides first molars and incisors to the group of generalized form of aggressive periodontitis, those with two or less teeth besides first molars and incisors were assigned to the group of localized form of aggressive periodontitis. Data includes pocket probing depths at 6 sites per tooth, microbiological testing (IAI Pado Test  $\geq 4.5$  and/or Meridol Test), GBI (Ainamo & Bay) and PCR (0’Leary).

#### Results:

n=117	LagP (n=32)	GagP (n=85)
Mean pocket depth	3.10 +/- 0.43	4.07 +/- 0.74
Total bacterial load (x104)	25.02 +/- 18.31	50.58 +/- 35.71
A. a. prevalence in % (n)	15,62 (5)	29,41 (25)
Mean GBI	12.27 % +/- 15.18	19.45 % +/- 21.41
Mean PCR	41.71 % +/- 22.12	46.87 % +/- 22.85

**Conclusion:** Patients suffering from a generalized form of aggressive periodontitis were more often tested positive for *A. a.* and had higher mean pocket depths, reflecting higher PCR, GBI and TBL Scores. It was also shown that at the time point of diagnosis bone loss was already far advanced. Against this background early signs of inflammatory periodontal diseases should be more focused on in daily examinations.

Topic: Clinical Research: Diagnosis and risk factors

## P0636

### Evaluation of bone level around endodontically treated teeth compared to contra-lateral teeth without root canal treatment in periodontitis patients

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Istanbul/Turkey

**Aim:** The aim of this study is to assess the effect of root canal treatment on bone level height in periodontitis patients.

**Material and Methods:** 60 pairs of radiographs of 53 periodontitis patients having one or more endodontically treated teeth and its intact/restored contra-lateral teeth without root canal treatment was evaluated. Linear measurements from cement-enamel junction (CEJ)/ restoration margin (RM) to the marginal bone level (BL) were scored in millimeter at mesial and

distal aspects by using a PC software program. BL was defined as the most coronal location of the bone margin adjacent to normal periodontal ligament space width. Bone level between endodontically treated teeth and their contra-laterals were tested using a Kruskal Wallis's test. P-values <0.05 were accepted as being statistically significant.

**Results:** The mean bone level was at 4.231 mm for endodontically treated teeth and at 3.426 mm for contra-laterals. No statistically significant difference was found between the bone levels around endodontically treated teeth compared to intact/restored contra-lateral teeth in periodontitis patients.

**Conclusion:** In periodontitis patients endodontic treatment had no effect on the bone level as compared with untreated contra-lateral teeth.

Topic: Clinical Research: Diagnosis and risk factors

## P0637

### A 10 year follow-up examination of periodontal status in young adults with insulin dependent diabetes mellitus (IDDM).

M. Hollingworth, B. Sjödin

Örebro/Sweden

**Aim:** In an earlier study the periodontal status of 41 young diabetics with IDDM since childhood (mean age=21.5 yrs) was compared to the status of 41 healthy controls. The periodontal health, expressed in probing pocket depths and marginal bone loss, was fairly good in all patients. No differences between the groups regarding periodontal or microbiological variables were found. A follow up study has been performed after 10 years.

**Material and Methods:** All patients and controls still living in the Örebro county Sweden (32 IDDM-patients & 26 controls) were invited to participate in the reexamination. 19 of the IDDM patients and 11 controls accepted. The patients were examined according to the same protocol used 10 years earlier.

**Results:** At the time of the re-examination the mean ages of the IDDM-patients and controls were 31.5 and 30.5 years respectively. The controls showed higher plaque and bleeding scores compared to the IDDM-patients (Plaque% 44 vs 29%; BoP% 32 vs 25). Two IDDM patients demonstrated single probing pockets depth >5 mm as did 3 controls while and another 2 controls also showed multiple pockets. Radiographic signs of marginal bone loss (CEJ-MBL > 2mm) were found in 1 IDDM patient and 2 controls.

**Conclusion:** 10 years after the original examinations none of the diabetic patients demonstrated any signs of progressing periodontal disease and only minor differences between the IDDM patients and the controls were found.

Topic: Clinical Research: Diagnosis and risk factors

## P0638

### Recurrence gingival enlargement at Behçet disease: a case report

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**Aim:** Behçet's disease (BD) is a chronic, relapsing, systemic vasculitis of unknown aetiology with clinical features of mucocutaneous lesions, ocular, vascular, articular, gastrointestinal. It is more common in "Silk Route" populations but has global distribution. BD affects primarily young subjects. Behçet Disease treatment has become much more effective in recent years with the; introduction of new drugs. Corticosteroids is one of them. Important side effects of steroids, hypertension, hyperkalemia, hypertrichosis, gingival hypertrophy, and hypomagnesemia. Side effects of topical corticosteroids should not be ignore.

**Material and Methods:** A 37 year old male patient was referred to Department of Prosthetic Dentistry in Ataturk University with poor oral hygiene and gingival enhance at maxilla and mandibula. We applied gingivectomy and gingivoplasty but observed such as pustul and papilloma gingival enhance after four weeks from surgery

**Results:** Gingival hyperplasia with its potential cosmetic implications and also providing new niches for the growth of microorganisms is a serious concern for both the patients and clinician. Corticosteroids are considered potential etiologic agents of drug-induced gingival hyperplasia.

**Conclusion:** we emphasize that gingival hyperplasia could be a side effect of corticosteroids even with a very short term and low dose administration.

Topic: Clinical Research: Diagnosis and risk factors

## P0639

### Comparison of HNP-3 and IL-1 $\beta$ in Smoker and Non-smoker Patients

H. Sahin, A. Dikilitas, A.S. Ertugrul

Van/Turkey

**Aim:** Antimicrobial peptides (AMPs) are small molecular weight proteins with broad spectrum antimicrobial activity against bacteria, viruses, and fungi. Defensins, a subgroup of AMPs are small cysteine-rich cationic proteins. Interleukins are a group of cytokines. The function of the immune system depends in a large part on interleukins. The aim of this study was to evaluate gingival crevicular fluid neutrophil defensin-3 (HNP-3) and interleukin-1 $\beta$  (IL-1 $\beta$ ) levels at smoker and non-smoker patients.

**Material and Methods:** In this study 60 patients were evaluated and they were divided into 4 groups. There were 15 patients in each group. 1st group: periodontally healthy, non-smoker patients. 2nd group: non-smoker patients with gingivitis. 3rd group: non-smoker patients with chronic periodontitis. 4th group: smoker patients with chronic periodontitis. An enzyme linked-immuno-sorbent assay was utilized to detect HNP-3 and IL-1 $\beta$  levels in gingival crevicular fluid.

**Results:** HNP-3 and IL-1 $\beta$  levels of periodontally healthy patients were found statistically lower than of other groups ( $p < 0.05$ ). HNP-3 and IL-1 $\beta$  levels in gingival crevicular fluid of smoker chronic periodontitis patients were statistically higher compared to non-smoker chronic periodontitis and gingivitis patients ( $p < 0.05$ ).

**Conclusion:** HNP-3 is an AMPs and IL-1 $\beta$  is a proinflammatory cytokine, causes alveolar bone resorption, increased in smoker chronic periodontitis patients. This results indicate that the severity of periodontal disease increases with smoking

because of these biomarkers increase in gingival crevicular fluid. Periodontally healthy patients had lower HNP-3 and IL-1 $\beta$  levels than other groups. This results show that these biomarkers are important for periodontal disease pathogenesis.

Topic: Clinical Research: Diagnosis and risk factors

## P0640

### Gingival biotype assessment : visual inspection relevance and maxillary versus mandibular comparison.

M. Houchmand, M. Leroul, J. Demoersman, L. Leguehennec, A. Soueidan

Nantes/France

**Aim:** The purpose of this clinical study was to evaluate the accuracy of gingival visual inspection procedures and to determine whether differences exist between the maxillary and mandibular gingival biotypes

**Material and Methods:** The study included 53 patients and 124 clinicians. Clinicians were asked to assign on photographic documents to each subject one of three biotypes based on the De Rouck classification, i.e., thin-scalloped, thick-scalloped, or thick-flat gingival biotype. 19,716 responses were collected for statistical analysis.

**Results:** The identification accuracy of the gingival biotype and the intra-examiner repeatability were poor highlighting the limited relevance of visual inspection. The percentile for agreement between classifications based on the global view of both the maxilla and mandible and the classification based on the individual mandibular or maxillary anterior teeth were not statistically significant.

**Conclusion:** A simple visual inspection is not effective for the identification of gingival biotype. Furthermore, evidence suggests that a difference of biotype between the maxilla and the mandible in the same patient is conceivable. Periodontal clinical examination should incorporate a reproducible method to discriminate thin from thick gingival and must be more accurate in terms of determining the individualized gingival biotype for each group of teeth that will be moved

Topic: Clinical Research: Diagnosis and risk factors

## P0641

### A New Method to Document Palatal Gingival Recessions

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<sup>1</sup>Mainz/Germany, <sup>2</sup>Bruchsal/Germany

**Aim:** Gingival recessions particularly when they are located in the maxillary palatal segment often are difficult to measure. In this regard the periodontal probe displays the established clinical method to record palatal gingival recessions. However an accurate determination of palatal gingival recessions is often difficult. Thus the aim of this study was to determine whether three-dimensional optical scanning and subsequent superimposing procedures can be used for a

supporting volumetric evaluation of palatal gingival recessions.

**Material and Methods:** Silicon impressions were taken of a maxilla master cast and four stone replicas of this master cast were poured. Every replica was scanned with a three-dimensional optical system (Activity, Smartoptics, Bochum, Germany) and a 3-D dataset representing the CAD reference model (CRM) was calculated by means of a triangulation method. Subsequently, gingival recessions were scratched in different palatal regions of each replica. The modified replica were scanned tenfold, a 3-D datasets was calculated, and superimposed. A computer-aided volumetric evaluation of the periodontal recessions was recorded using the difference image with regard to the initial situation. In order to evaluate the volume of periodontal recessions, the mean and the standard deviation were calculated.

**Results:** Volume measurements show small standard deviations for all replicas.

Modell	1	2	3	4
mean	11.27	10.53	22.11	24.64
SD	0.43	0.34	0.45	0.33

Table 1: Mean volume and standard deviation of palatal gingival recessions [ $\mu$ l].

**Conclusion:** This novel method allows a reproducible in vitro quantification of palatal gingival recessions scratched in stone replicas.

Topic: Clinical Research: Diagnosis and risk factors

## P0642

### In Vivo Microvascular Alterations of Marginal Gingiva In Health and Disease

S. Unal, B.F. Oduncuoglu, E.E. Alaaddinoglu, H. Kara, D. Sahin

Bahcelievler/Turkey

**Aim:** Videocapillaroscopy is a non-invasive procedure useful in early diagnosis of damage in microcirculation of some inflammatory diseases such as diabetes. The aim of this study was to observe the microcirculation characteristics of the gingival margin by a digital microscope in healthy, chronic gingivitis and chronic periodontitis patients in vivo and to results with gingival index (GI) scores.

**Material and Methods:** Forty-five healthy, non-smoker patients were randomly selected to participate in the study. They were categorized into three groups of 15 patients each, based on their periodontal tissue status, as follows: group I (clinically healthy gingiva); group II (chronic gingivitis); and group III (chronic periodontitis). Plaque Index (PI), GI and probing depths (PD) of six maxillary anterior teeth were recorded for each participant. Gingival capillaroscopy was used to investigate the characteristics of micro-circulation with x200 magnification. Visibility, course, tortuosity and the number of visible capillary loops per square millimeter were evaluated for each tooth.

**Results:** Capillary loops were perpendicular to the surface at sites with GI2, and dense, hairpin-like capillary loops were observed. Number of capillaries increased in inflamed gingiva compared to the health.

**Conclusion:** Results of this study suggest that the microvascular alterations at the gingival margin could be an objective criteria associated with periodontal defense mechanism and periodontal disease activity.

Topic: Clinical Research: Diagnosis and risk factors

## P0643

### The relationship between periodontal disease and atherosclerosis from the viewpoint of the community periodontal index of treatment needs, cardiovascular disease risk and arterial stiffness: preliminary study

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Kirikkale/Turkey

**Aim:** Several studies reported positive correlation between periodontal disease and atherosclerosis. The aim of this study was to assess the association between periodontal diseases and atherosclerosis using Community Periodontal Index of Treatment Needs (CPITN), 5 year Cardiovascular Diseases Risk (CVD Risk) and arterial stiffness index (SI).

**Material and Methods:** One hundred and fourteen subjects were divided into two age groups as 21–40 years and 41–54 years. The participants were given questionnaires about their daily life and dental habits. Oral and medical examinations were performed. The periodontal status were determined using CPITN and modified CPITN (mCPITN) and missing teeth (MT) counts were recorded. 5 year CVD Risk were calculated by Framingham Risk score using age, sex, systolic blood pressure, smoking status. Moreover, plethysmographic pulse wave contour analysis of patients were recorded to determine SI.

**Results:** CPITN, mCPITN, MT, CVD Risk Score and SI values increased significantly with age ( $P < 0.05$ ). There were positive correlations between MT and SI, MT and CPITN, and mCPITN and CVD risk ( $p < 0.05$ ). When we examined CVD Risk scores according to mCPITN, people with periodontitis were numerically higher than people with gingivitis in older age group.

**Conclusion:** Our study showed that both periodontal diseases and CVD Risk were increased with age. Although periodontal diseases were not found to be associated with arterial stiffness there was a positive correlation between MT and arterial stiffness.

Topic: Clinical Research: Diagnosis and risk factors

## P0644

### Variations in the clinical sulcus depth of healthy human gingiva measured with electronic probe.

C. Bories, Z. Badran, J. Demoersman, X. Struillou, A. Soueidan  
Nantes/France

**Aim:** This work aimed to measure the sulcus depth of fully erupted teeth in a population of students in the second year of dental studies, which represent a relatively homogeneous population with excellent oral hygiene and absence of overt gingival inflammation.

**Material and Methods:** The study population consisted of 59 healthy volunteers students, 34 females and 25 males

The average age was 20.4 years ( $\pm 0.98$ )

Probing was carried with the Florida electronic probe ®

We measured six sites per tooth (160 sites on average per student) and collected the index of bleeding on probing (BOP) and O'Leary plaque index.

**Results:** The average depth of the sulcus is 1.46 ( $\pm 0.17$ ). The minimum depth is 0.2 mm and the maximum is 4.4 mm. mm

Although each student had a personally characteristic distribution of PD across different sites, the molars have significantly deeper sulcus than the incisors.

Inside the same hemi-arch, there is a significant difference between sulcus depth of premolar and molar.

**Conclusion:** Florida Probe allows a more subtle analysis of the probing depth with a resolving level of 0.2, comparing to 0,5 mm of manual probe. We know that in most clinical studies a difference of 0.5 is often sufficient to conclude to a significant difference, but this corresponds to average of a large number of sites for each patient. The use of electronic probe and a more exhaustive and detailed longitudinal presentation of results per tooth or per site would allow to a more relevant analysis of treatment outcomes.

Topic: Clinical Research: Diagnosis and risk factors

## P0645

### Local effects of cigarette on periodontal health in smokers

S. Farahvash, T. Altinok, K. Eren

Ankara/Turkey

**Aim:** Smoking and related heat can cause recession of local gingival papilla and marginal gingiva . The aim of this study is to detect the periodontal status of the regions that is exposed directly to the smoke compared to the symmetrical sites.

**Material and Methods:** In this study ,28 individuals who smoked more than a pack per day were selected. Each patient was evaluated for PI, GI, CAL, PD , BOP at the region which is exposed to cigarette smoking compared to the symmetrical region . Also the photographic measurements have been identified for both sites.

**Results:** The resulting data analyzed statistically. The results have shown that smoking adversely affects periodontal health at sites exposed to the smoke.

**Conclusion:** Smoking adversely affects periodontal health and esthetics.

Topic: Clinical Research: Diagnosis and risk factors

## P0646

### Identification of possible determinants in periodontal status of type 1 diabetic children

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Coimbra/Portugal

**Aim:** The number of children with diabetes mellitus (DM) is continually increasing and they are known to have additional



risk for developing early periodontal disturbances. The aim of this work was to assess some periodontal determinants and DM potentially related factors on a type 1 diabetic population.

**Material and Methods:** 205 children (133 diabetic and 72 healthy controls), from 5-15 years-old, were clinical and analytically evaluated (hygiene habits, gingival bleeding, calculus, malocclusion, metabolic control based on HbA1c records, salivary flow rate and buffer capacity, yeast colonization, salivary T-cell subpopulations expression and metabolites concentration). Stimulated saliva was used for yeast isolation, quantification and identification, flow cytometry and <sup>1</sup>H-NMR. The results were analysed with SPSS 19®, Mann-Whitney and X2 tests ( $p < 0.05$ , 95%).

**Results:** Statistically significant differences were obtained between periodontal condition and: a) being a type 1 diabetic or healthy (X2,  $p = 0.001$ ); b) being a controlled diabetic or healthy (X2,  $p = 0.001$ ); c) age (X2,  $p = 0.002$ ); d) frequency of tooth brushing (X2,  $p = 0.017$ ); e) malocclusion (X2,  $p = 0.004$ ); f) salivary subpopulation of CD3+ T cells (Mann-Whitney,  $p = 0.014$ ).

**Conclusion:** The percentage of children with gingival alterations was higher in the diabetic group, particularly those with worse metabolic control. The relevance of oral hygiene may be important in preventing future periodontal complications in diabetic children. Once the host response is believed to have protective, as well as a destructive role, both in periodontal disease and type 1 DM, the differences found in the salivary CD3+ T-cells subpopulation may reflect differences in the immunopathology of clinical lesions.

Topic: Clinical Research: Diagnosis and risk factors

**P0647**

### Effect of smoking on total antioxidant capacity, total oxidant status and lipid peroxidation levels in serum and saliva in patients with chronic periodontitis

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Trabzon/Turkey

**Aim:** The aim of this study was to evaluate the effects of smoking on the systemic and local total antioxidant capacity (TAOC), total oxidative status (TOS), malondialdehyde (MDA) levels and oxidative stress index (OSI) of patients with chronic periodontitis.

**Material and Methods:** A total of 72 chronic periodontitis patients [38 smokers (S+P+), 34 non-smokers (S-P+)] and 54 periodontally healthy individuals [28 smokers (S+P-), 26 non-smokers (S-P-, control)] were included in the study. Following clinical measurements and samples; cotinine, TAOC, TOS and MDA levels were determined. OSI was calculated by the formula " $[(TOS/TAOC) \times 100]$ " and the obtained data were analyzed statistically.

**Results:** In periodontitis patients who smoked, decreased serum and salivary TAOC levels and increased TOS and MDA levels and OSI were found. The lowest TAOC and the highest TOS and MDA levels and OSI were seen in the S+P+ group, whereas the highest TAOC and the lowest TOS and MDA levels and OSI were observed in controls ( $p < 0.05$ ). In an oxidative stress analysis, the systemic and local effects of smoking seemed

more evident than those of periodontitis, but no statistically significant difference was found between the smoking (S+P-) and periodontitis (S-P+) groups ( $p < 0.05$ ).

**Conclusion:** Smoking and/or chronic periodontitis decreases systemic and local TAOC, while increasing TOS and MDA levels and OSI. Our findings show that smoking is at least as effective as periodontitis in terms of its effect on systemic and local oxidative stress parameters, and that smoking-related oxidative stress may play an important role in the pathology of periodontitis.

Topic: Clinical Research: Diagnosis and risk factors

**P0648**

### Efficacy of tobacco counseling cessation promotion (TCCP), in a private practice, prior to periodontal surgery.

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Torino/Italy

**Aim:** Smoking is associated with a reduced healing response after periodontal treatment. Therefore, today's dental professional must counsel patients on tobacco cessation, before planning the surgical therapy. Dental hygienists are generally receptive to smoking cessation counseling, yet only a minority report routinely implementing the TCCP. The aim of this prospective investigation was to evaluate the effects of TCCP performed by a dental hygienist on the quitting rate, using the intervention recommended by the United States Public Health Service (USPHS), as described in the Clinical Practice Guideline (5 A's).

**Material and Methods:** From January 2010 to June 2011, seventy-four smokers (35 males and 36 females; mean age: 58 + 7.9 years), who presented signs of periodontitis were consecutively enrolled from all those attending the senior investigator's private practice and presented a serious "intention to quit" attitude.

**Results:** Of the 74 persons originally accepting to participate in the study, 3 changed their mind leaving 71 for study registration. Fourteen out of 71 stopped smoking for a minimum period of 6 months (Quit rate 19.7 %). Twenty-seven significantly reduced the number of cigarettes per day. In 12 patients no changes were detected, while four patients increased the number of cigarettes smoked. The overall mean number of cigarettes per day decreased from 15.3 +/- 7.2 to 9.8 +/- 8.0. Excluding from the calculation the patients who quit, the reduction was from 15.8 +/- 7.3 to 12.2 +/- 7.0. Both differences were statistically significant.

**Conclusion:** The results of this study shows that TCCP can be effective in a private practice. More research is needed on additional methods of increasing the quitting rate and on techniques for avoiding relapse.

Topic: Clinical Research: Diagnosis and risk factors

## P0649

### Influence of adult attachment on periodontal disease – a pilot study

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**Aim:** The role of psychosocial variables in oral diseases has received increased attention over the last years. One area of interest concerns the influence of attachment patterns. Attachment theory adds to known risk factors by linking early interactional experiences with adult tendencies of stress-regulation, health behavior, symptom-reporting, and healthcare utilization. Purpose of this study was to investigate associations between adult attachment patterns and periodontal parameters.

**Material and Methods:** In context of a longitudinal study on periodontal diseases, patients from the Department of Conservative Dentistry and Periodontology at the University of Kiel were consecutively recruited. From a total sample of 737 patients, 305 gave their written informed consent and filled out questionnaires on demographic and psychosocial factors, including attachment.

**Results:** Multivariate analyses demonstrated that attachment avoidance was related to tooth loss during SPT ( $11.27 \pm 7.7$  years). Patients with more attachment avoidance and higher periodontal risk lost  $0.44 \pm 0.67$  more teeth compared to higher attachment anxiety ( $p < 0.05$ ). Independent of periodontal risk, patients with higher attachment avoidance and depressions lost  $1.76 \pm 2.54$  teeth (without depression:  $1.29 \pm 2.02$ ). Attachment anxiety was associated with higher healthcare utilization ( $3.02 \pm 1.08$  vs.  $2.84 \pm 1.10$  visits/year), independent of baseline periodontal risk ( $p < 0.05$ ).

**Conclusion:** Higher avoidance increased the risk of adverse health outcomes, especially under conditions of high individual demands. The findings on attachment anxiety can either be interpreted as a risk for increased health care costs, or better interpersonal compliance. Within the limitations of the study it could be shown that psychological attachment patterns are a promising target for understanding periodontal disease over and above other known psychosocial risk factors.

Topic: Clinical Research: Diagnosis and risk factors

## P0650

### Dental extractions in patients treated with intravenous bisphosphonates and risk of osteonecrosis of jaws: presentation of a preventive protocol and caes series.

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Liege/Belgium

**Aim:** Dental extraction remains contra-indicated in patients treated with intravenous (IV) bisphosphonates for oncology reasons because of the high risk of bisphosphonate-related osteonecrosis of the jaw (BRONJ). The objective of the present abstract was to present a preventive tooth extraction protocol in patients treated with IV bisphosphonates based on the surgical removal of the alveolar process. The second objective was to identify potential risk factors to develop BRONJ.

**Material and Methods:** 17 patients treated with IV bisphosphonate and needing at least a tooth extraction, were included. A standardized extraction protocol was followed, including alveolectomy of at least 50% of the alveolar process, pre and post-operative antibiotherapy was administered. The patients were followed for a mean period of 29 months (min:3 -max:62).

**Results:** In all, 17 patients and 22 extraction sites mandible (15), maxilla (7) were involved in the study. No signs of inflamed tissue or necrotic exposed bone in any patient were observed during the follow-up period and the level of comfort for the patient was improved in all cases. Nevertheless, when a careful screening of the healing area was made using a probe, in 4 out of 22 (18,2%) sites, a remaining bone contact was found and appeared to be related location (mandible), duration of bisphosphonate treatment and to concomitant.

**Conclusion:** The present cases series suggests that the described extraction protocol in IV bisphosphonate patients allowed 100% bone healing and complete soft tissues healing in 81.8% of the extraction sites. The sites that have not fully recovered seemed to be related to different factors.

Topic: Clinical Research: Diagnosis and risk factors

## P0651

### TNFR2 and MMP-9 Gene Polymorphisms in Chronic and Aggressive Periodontitis in Turkish Population

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**Aim:** Genetic polymorphisms for cytokines and their receptors have been proposed as potential markers for periodontal disease. Tumor necrosis factor receptor 2 (TNFR2) is one of the cell surface receptors for TNF- $\alpha$ . TNFR2 (+587) gene polymorphism is involved in autoimmune and other diseases. Matrix metalloproteinases (MMPs) are a group of endogenous proteinases that contribute to degradation of extracellular matrix and basement membrane components. The aim of this study was to analyze TNFR2 (+587) T/G and MMP-9 (-1562) C/T polymorphisms in chronic (CP) and aggressive periodontitis (AP) patients and healthy controls.

**Material and Methods:** In this study, single nucleotide polymorphisms (SNP) were analyzed by PCR and RFLP methods in DNA samples isolated from the bloods. For TNFR2 (+587) T/G polymorphism; TT, GG and TG genotype and allele frequencies were analyzed in a total of 88 patients with CP and AP and 25 controls. For MMP-9 (-1562) C/T polymorphism; CC, TT and CT genotype and allele frequencies were analyzed in a total of 51 patients with CP and AP and 32 controls.

**Results:** For TNFR2 (+587) T/G polymorphism, the differences in genotype ( $p = 0.946$ ) and allele ( $p = 0.648$ ) frequencies, and for MMP-9 (-1562) C/T polymorphism, the differences in genotype ( $p = 0.931$ ) and allele ( $p = 0.868$ ) frequencies were not significant between the groups.

**Conclusion:** The preliminary findings of this study indicated no significant difference in genotype and allele frequencies between the groups with respect to SNPs in TNFR2 and MMP-9 genes in Turkish population. Further studies including greater number of subjects and performing linkage analyses may provide more meaningful results.

Topic: Clinical Research: Diagnosis and risk factors

## P0652

### Proteomic and Microbial Profiling of human cervico-vaginal fluid und saliva of pregnant women throughout gestation

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**Aim:** As already known, many studies show, that there is a close relationship between periodontitis and preterm birth. The aim of this study is to identify proteomic markers for preterm birth at the onset of spontaneous preterm labour (SPTL).

**Material and Methods:** 15 pregnant women were recruited to generate shotgun proteomic profiles of tryptically digested cervical-vaginal fluid and saliva using liquid chromatography tandem mass spectrometry (LC-MS/MS). The pocket depth and bleeding on probing of every woman are collected. The periodontitis risk test and an analyzation of the bacteria will be investigated at the clinical hygiene institute. The identification of proteomic biomarkers for preterm birth (PTB) will be carried out by comparison of cervico-vaginal and salivary proteomic profiles of five pregnant women with spontaneous preterm labour (SPTL) who subsequently deliver preterm to those of five pregnant women with SPTL who deliver at term. The proteomes of both SPTL groups will be compared to the proteomes of five pregnant women without labour matched by gestational age. Proteins revealing more than 5 counts over all samples in spectral counting will be further analyzed. Protein changes will be considered significant with a peptide index (PI) > 0.4 and a p value < 0.017 in paired t-test or Wilcoxon test performed with SPSS version 18.

**Results:** The microbiological investigations and proteomics are still under progress, we will get the final results and the statistical evaluation until April 2012.

**Conclusion:** We expect to find new biomarkers, that an earlier treatment can be started to avoid PTB or SPTL.

Topic: Clinical Research: Diagnosis and risk factors

## P0653

### Oral Piercing: Periodontal and Microbiological Findings

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**Aim:** The prevalence of early and late complications associated with lip and tongue piercing will be presented. Possible cofactors were evaluated by the study group. Microbiological differences in bacterial samples collected from lip and tongue piercings made of different materials are presented.

**Material and Methods:** A total of 210 subjects with lip and / or tongue piercings participated in these studies. A baseline dental examination evaluated periodontal and dental complications. In a subgroup of 160 subjects, sterile piercings of four different materials were randomly allocated to the study subjects. After 2 weeks, microbiologic samples were collected and processed

by checkerboard deoxyribonucleic acid- deoxyribonucleic acid hybridization methods.

**Results:** The prevalence of periodontal complications is highest in median lower lip piercings (72%; 36/50), and lowest in lateral upper lip piercings (0%; 0/8). For tongue piercings, the prevalence of gingival recession was 28.8% (61/80). In samples from stainless steel piercings, the total microbial load was significantly higher than from the other materials (p < 0.05). Periopathogenic species were found at significantly higher levels p < 0.001) on steel than on polypropylene and/or polytetrafluoroethylene piercings.

**Conclusion:** Early and late complications after oral piercing are frequent. Studs made of stainless steel might promote the development of a pathogenic biofilm. Owing to the high prevalence of late complications especially after median lip piercing, persons with oral piercing should attend regular dental checks and receive professional advice on tooth cleaning and oral hygiene.

Topic: Clinical Research: Diagnosis and risk factors

## P0654

### The relationship of alcohol consumption with periodontitis in Brazilian Indians

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**Aim:** Conflicting findings were reported on the association between alcohol consumption and periodontitis. The aim of this study was to investigate the association between alcohol consumption and periodontitis.

**Material and Methods:** The sample consisted of 226 Indians (19-77 years) from 10 isolated Indian Areas of the Northeast of Brazil. Full-mouth hygiene on plaque index (PI), bleeding on probing (BoP), probing depth (PD) and clinical attachment loss (CAL) were registered by calibrated examiners. The following interview data were collected: age, sex, smoking habits, alcohol consumption and the type of alcohol (distilled or fermented).

**Results:** Probing depth, clinical attachment level, plaque index and bleeding on probing were not associated with alcohol consumption, after adjustment for confounders (p maior ou igual a 0.48).

**Conclusion:** It was concluded that the prevalence of periodontitis among alcohol users was less. Although incidence was found in the village of bone loss, in the consuming of alcohol daily had no difference in the clinical parameters of disease periodontal

Topic: Clinical Research: Diagnosis and risk factors

## P0655

### Quantitative Analysis of Alveolar Bone Level using AutoCAD Software

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**Aim:** Establish and evaluate new quantitative method for measurement of alveolar bone level using AutoCAD software program.

**Material and Methods:** Oral panoramic radiographs of 168 teeth were studied. The area from the cemento-enamel junction (CEJ) to the alveolar bone level (BL) and the area from the CEJ to the root apex (RA) were directly measured. At the same time, the distance between the CEJ and BL as well as the distance between the CEJ and RA were measured. The proportional values of the area and distance of the alveolar bone loss were analyzed. The images were measured using AutoCAD software program.

**Results:** A total of 336 areas and 672 linear distances (CEJ-BL plus CEJ-RA) from the oral panoramic radiographs were measured. There was high correlative consistency between the traditional length ratios of the alveolar bone loss and the area ratios obtained by using AutoCAD. Pearson's correlation coefficient was 0.921 ( $p < 0.001$ ). There were great agreement between different operators, the intra-class correlation coefficient (ICC) was 0.994 (95%CI: 0.988-0.997,  $p < 0.001$ ). Pearson's correlation coefficient was 0.988 ( $p < 0.001$ ).

**Conclusion:** The area ratios of the alveolar bone loss measured using AutoCAD may be a new method feasible for quantitatively evaluating alveolar bone level.

Topic: Clinical Research: Diagnosis and risk factors

## P0656

### Effectiveness of malic acid 1% (Xeros Dentaïd Spray®) on the Dry Mouth Questionnaire (DMQ) in patients with diuretics-induced xerostomia

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**Aim:** Assessing the clinical subjective effectiveness of a topical sialogogue on spray (malic acid, 1%) in the treatment of diuretics-induced xerostomia.

**Material and Methods:** It has been carried out through a randomized double-blind clinical trial. 32 patients with diuretics-induced xerostomia were divided into 2 groups: the first group (18 patients) received a topical sialogogue on spray (malic acid 1%, Xeros Dentaïd Spray®, Dentaïd, Barcelona, Spain) whereas the second group (14 patients) received a placebo. Both of them were administered on demand for 2 weeks. Dry Mouth Questionnaire (DMQ) was used in order to evaluate xerostomia before and after product/placebo administration. All the statistical analyses were performed by using SPSS software v17.0. Different DMQ scores at the earliest and final stage of the trial were analysed by using Mann-Whitney U test. Critical p-value was established at  $p < 0.05$ .

**Results:** DMQ scores increased significantly from 1,05 to 3,08 points ( $p < 0.05$ ) after malic acid (1%) administration whereas DMQ scores increased from 1,02 to 1,14 points ( $p > 0.05$ ) after placebo administration.

**Conclusion:** Malic acid 1% spray improved diuretics-induced xerostomia according to DMQ.

Topic: Clinical Research: Diagnosis and risk factors

## P0657

### Influence of the variable age for long-term tooth retention after 15 years of periodontal supportive therapy (SPT)

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**Aim:** The aim of this retrospective study was to evaluate the influence of age on tooth loss during long-term SPT in advanced aggressive (AgP) and chronic periodontitis (CP).

**Material and Methods:** 213 compliant patients (AgP: 55; CP: 158; n teeth = 4939) were included when following criteria were fulfilled: bone loss  $\geq 50\%$  at  $\geq 2$  teeth, age  $\leq 35$ y for AgP (CP:  $\geq 40$ y) and SPT over at least 10 years. Age groups (A:  $< 40$ , B: 40-49, C:  $> 49$ y) at baseline were defined. Kaplan-Meier estimate was used to determine survival.

**Results:** During SPT of  $15.6 \pm 4.8$ y, 437 (7.33%) teeth were lost in total. In AgP 6.1%, 12.3% and 0% (n.a.) (CP: 7.3%, 10.0%, 9.5%) of all teeth for the age groups A, B and C, respectively, were extracted during SPT. After 15 years the tooth survival probability in A was 94.2%, B 92.0% and C 90.0%, independent from the initial diagnosis ( $p < 0.001$ , log-rank test). For the first 10 years of SPT the tooth survival rate for AgP was 96.3% compared to 93.8% in CP ( $p = 0.064$ , log-rank test). In the following 5 years the tooth survival rate in AgP declined to 93.0% (CP 91.5%). After adjusting for age, 90.0% survival rate in AgP after 15 years was found (CP 92.7%).

**Conclusion:** In patients with advanced periodontitis long-term tooth retention is feasible independent from patients' age. Adjusted for age after more than 10 years SPT tooth survival in AgP seemed to be less favourable than in CP.

Topic: Clinical Research: Diagnosis and risk factors

## P0658

### Genetic and dietary impact on multifactorial etiology of aggressive and chronic periodontitis: data from a Polish cohort of patients

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**Aim:** The aim of the study was to search for new genetic risk factors and to determine the dietary factors associated specifically with periodontal disease.

**Material and Methods:** A sample of 96 unrelated patients suffering from periodontitis (61 cases with aggressive and 35 cases with the chronic form of the disease) and 101 control subjects from Poznań region were recruited.

A case-control association analysis between IL-1B (-511 and +3954) and APOE genes variability and periodontal disease was performed.

Food consumption data were collected among patients and



controls by 24-hours recall and on this basis nutrient intakes and the antioxidant capacity of the diets (ORAC score) were calculated.

**Results:** No statistically significant differences ( $p > 0.05$ ) in the distribution of IL-1B genotypes and allele frequencies between patients and controls were found. On the contrary, we observed the increased frequency of the APOE\*2 allele among patients, especially in a group of subjects with aggressive form of periodontal disease. Dietary levels of calcium, thiamine, folate, vitamin C and antioxidant capacity were significantly reduced in patients.

**Conclusion:** A genetic variability of the apolipoprotein E linked to lipid transport and metabolism is the important risk factor for many diseases. We suggest that it is possible that APOE\*2 allele (apoE2 variant) may be a new genetic risk factor for early-onset aggressive form of periodontitis.

The nutrient supply in patients with chronic periodontal disease differs significantly from that of the healthy subjects without dental treatment, although periodontal patients appear to be more susceptible for nutritional insufficiency.

## Topic: Clinical Research: Diagnosis and risk factors

### P0659

#### Relationship between Psychosocial Stress and Periodontitis in a Prisoner Population

P. Gottwald

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**Aim:** Psychological stress might act as a risk factor for periodontitis. Either by modulation of cortisol controlled inflammatory pathways or modification of behaviour. The aim of this study was to investigate the relationship in a special group of patients who are supposed to have major stress.

**Material and Methods:** In this cross-sectional study a special, homogenous group of patients was examined. Thirty volunteers of the prison of the city Győr were asked to fill in a questionnaire that was designed to measure psychosocial stress and coping. Data were evaluated as recommended by the authors of the questionnaire. Participants also underwent a clinical examination: Probing Pocket Depths (PPD) and Bleeding on Probing (BoP) were recorded.

**Results:** Patients with stronger perceived stress had significantly more deep pockets ( $\geq 4$ mm). Bleeding on Probing was significantly lower, when the stress value was lower. Stress and coping had strong positive correlation.

**Conclusion:** Evaluation of clinical and psychological data confirms the hypothesis. Within the limitations of the study it is assumed that there is a relationship between psychosocial stress, coping and periodontal status.

## Topic: Clinical Research: Diagnosis and risk factors

### P0660

#### Subjective effectiveness of malic acid 1% (Xeros Dentaïd Spray®) in patients with antidepressants-induced xerostomia

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**Aim:** Assessing the clinical subjective effectiveness of a topical sialogogue on spray (malic acid, 1%) in the treatment of antidepressants-induced xerostomia.

**Material and Methods:** It has been carried out through a randomized double-blind clinical trial. 24 patients with antidepressants-induced xerostomia were divided into 2 groups: the first group (13 patients) received a topical sialogogue on spray (malic acid 1%, Xeros Dentaïd Spray®, Dentaïd, Barcelona, Spain) whereas the second group (11 patients) received a placebo. Both of them were administered on demand for 2 weeks. Dry Mouth Questionnaire (DMQ) was used in order to evaluate xerostomia before and after product/placebo administration. All the statistical analyses were performed by using SPSS software v17.0. Different DMQ scores at the earliest and final stage of the trial were analysed by using Mann-Whitney U test. Critical p-value was established at  $p < 0.05$ .

**Results:** DMQ scores increased significantly from 1,07 to 2,64 points ( $p < 0.05$ ) after malic acid (1%) administration whereas DMQ scores increased from 1,10 to 1,23 points ( $p > 0.05$ ) after placebo administration.

**Conclusion:** Malic acid 1% spray improved antidepressants-induced xerostomia according to DMQ.

## Topic: Clinical Research: Diagnosis and risk factors

### P0661

#### The bleeding site: a multi-level analysis of associated factors in a cohort of 600 patients.

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**Aim:** To evaluate the association between patient-related as well as site-specific factors and the probability of a sulcus/pocket to bleed upon probing.

**Material and Methods:** 601 patients (90714 sites) were retrospectively included in the present analysis. Probing recordings, including bleeding on probing (BoP) and probing pocket depth (PPD), had been performed at initial exam. A logistic multilevel multifactorial model was implemented to evaluate the effect of patient-related factors and site-specific characteristics on the probability for a site to be BoP+. Subgroups of patients with different susceptibility to BoP were also considered (Farina et al. 2011).

**Results:** The probability for a site to be BoP+ was significantly influenced by PPD (OR= 1.85), tooth aspect (OR= 1.2 for interproximal vs. approximal sites) and location (OR= 1.09 for

posterior vs. anterior teeth; OR= 1.05 for mandibular vs. maxillary teeth), and smoking status (OR= 0.82 for smokers vs. non-smokers). The final model explained 37% of the variability. A significant correlation of 78% was found between the probability of a site to be BoP+ and PPD. The patient-level residual variance increased with the mean PPD. When controlling for PPD, individuals in the high bleeding group presented a 4 times higher probability for site to be BoP+ compared to low bleeding patients.

**Conclusion:** Presence of a pocket, tooth site/location and smoking status may affect the risk for a site to bleed upon probing. Patient-related factors that may have a strong role in determining the bleeding tendency at the site level need to be further investigated.

Topic: Clinical Research: Diagnosis and risk factors

## P0662

### BMI and periodontal risk. Association study.

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**Aim:** The aim of this study was to verify the association between the individual periodontal risk and the body mass index (BMI) in subjects seen at the Clinic of Periodontology of the Federal University of Bahia.

**Material and Methods:** The BMI and the polygon of risk diagrams (Lang & Tonetti2003) of 110 consecutive subjects ranging in age from 17 to 84 years (mean 49,6 years), 72,72% being females and 27,27% males, were taken by undergraduate dental students between 2010 and 2011. The Chi-square R statistics v2.13.0 was used. All subjects agreed in participating in the study by means of a written consent.

**Results:** Low, moderate and high periodontal risk were found in 5 (4.55%), 50 (45.45%) and 55 (50%) of the study group, respectively. A BMI > 25 was found in 56 subjects (50.90%). There was found association between BMI and sex (X<sup>2</sup>, 5.61), women being more affected; BMI and age (X<sup>2</sup>, 106.58), with an increase of BMI in higher age groups and BMI and periodontal risk (X<sup>2</sup>, 10.89).

**Conclusion:** In this preponderantly high periodontal risk study population increased BMI showed association with periodontal risk. Educational programs on nutrition and oral health care are highly recommended to be implemented.

Topic: Clinical Research: Diagnosis and risk factors

## P0663

### Migration of a dental implant into the maxillary sinus: Case report

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**Aim:** This article reports a rare case of a displaced dental implant that migrated into the maxillary sinus.

**Material and Methods:** A 46-year-old patient presented with maxillary sinusitis as a result of the migration of an implant into the sinus.

**Results:** It was produced one month after placement of the implants. The most commonly used technique for retrieval of dental implants is the Caldwell-Luc procedure. We removed it by using this technique.

**Conclusion:** Invasion of the maxillary sinus is a relatively frequent complication in dental implant treatment of patients in the posterior maxilla. The posterior maxilla, which frequently has inadequate quality and quantity of bone, and the contiguous maxillary sinus often provide poor recipient sites for dental implants.

Topic: Clinical Research: Diagnosis and risk factors

## P0664

### Diagnosis and Measurement of Gingival Recession and its Relation to Clinical Skills.

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**Aim:** To assess whether differences exist in the diagnosis of gingival recession and its maximum extent measurement according to the examiner level of knowledge and experience.

**Material and Methods:** Four examiners with different levels of experience (2 postgraduate students and 2 experienced periodontists) evaluated gingival recession in patients with a manual periodontal probe (PCP11 colour-coded; Hu-friedy, Chicago, IL, USA). Measurements were done in 15 adults (age range 22 -35 years) with good oral hygiene. Gingival recession was assessed only at buccal tooth surfaces. The extent of recession in millimeters, was measured and recorded at the point on the tooth site with maximum recession. The statistical analysis of the data was carried out with the statistics package SPSS 15.0.

**Results:** The degree of interexaminer agreement obtained from assessing the presence or absence of gingival recession and its maximum extent was weak (Kappa =-0.20, p < 0.05; Kappa=-0.23, p < 0.05). Inexperienced examiners diagnosed more gingival recessions than expert examiners (mean = 6.57 and 4.17, respectively), but the differences were not statistically significant (p = 0.131). Inexperienced examiners recorded significantly greater recession measurements than expert examiners (mean = 0.79 mm and 0.50 mm, respectively) (p < 0.001).

**Conclusion:** The accuracy of the diagnosis and measurement of gingival recession is related to the experience of the clinicians.

Topic: Clinical Research: Diagnosis and risk factors

## P0665

### Intronic Single Nucleotide Polymorphism rs1537415 and Generalized Chronic Periodontitis

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**Aim:** About half of the population variance in chronic periodontitis (CP) can be attributed to genetic factors. Recently, the intronic single nucleotide polymorphisms (SNP) rs1537415 within the glycosyltransferase gene GLT6D1 has been shown to be associated with Aggressive Periodontitis (AP) in German-Dutch patients.

The frequency of the G allele of this SNP has been demonstrated to be 0.48 in AP-patients and 0.39 in healthy controls ( $P = 5.51 \times 10^{-9}$ ,  $OR=1.59$ ). Functional analysis of the G-allele SNP indicated a reduced binding affinity for potential transcription factors. Therefore, the aim of the present study was to analyze the role of SNP rs1537415 in German patients with CP.

**Material and Methods:** 159 patients with untreated moderate to severe chronic periodontal disease and 53 periodontally and systemically healthy patients were enrolled in the MURIS study (multiple risk assessment study) at the University of Muenster between 2001 and 2005. Clinical data (Pocket probing depth, Bleeding on probing, number of teeth) were recorded before and 12 months following periodontal therapy. Venous blood was obtained by venipuncture and DNA was isolated subsequently. The polymorphism rs1537415 was analyzed by allele-specific polymerase chain reaction and agarose gel electrophoresis.

**Results:** The risk G allele showed an allele frequency in CP-patients of 0.36 and of 0.43 in healthy controls ( $P= 0.2$ ,  $OR = 1.37$ ; 95% CI 1.37-2.2). The allele frequency in the European HapMap CEU reference population is 0.39.

**Conclusion:** The results of this study indicate that the SNP rs1537415 is not associated with chronic periodontitis in German patients.

Topic: Clinical Research: Diagnosis and risk factors

**P0666**

### Detection of JP2 and non-JP2 clonal types of *Aggregatibacter actinomycetemcomitans* in clinical samples analyzed at the microbiological laboratory in Dental School in Umeå, Sweden

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**Aim:** The bacterium *Aggregatibacter actinomycetemcomitans* is associated to periodontitis, especially to the aggressive type of the disease. Individuals infected by the JP2 clone, a variant of the bacterium producing high amounts of leukotoxin due to a deleted leukotoxin promoter gene, are at increased risk for developing disease. The aim of this study is to determine prevalence of JP2 and non-JP2 clonal types of *A. actinomycetemcomitans* in samples collected from patients living in Sweden and to characterize isolates of the JP2 clone with regard to origin and genetic intra-clonal variability

**Material and Methods:** *A. actinomycetemcomitans* in subgingival plaque samples ( $n=2464$ ) collected from 1114 patients during 2000 to July 2011 was quantified by culture technique. Leukotoxin promoter typing and characterization of genetic variability was done by gene-specific primers and by AP-PCR, respectively. DNA-sequencing of the pseudogene *hbpA* was performed to determine the origin of isolated JP2 clonal strains.

**Results:** The prevalence of *A. actinomycetemcomitans* was in all patients 25.6%, in patients 35 years or older, 37.6%, and 24% in patients older than 35. The JP2 clone was detected in 0.72%. Among eight JP2 carriers detected in the study material seven were of non-African origin, one was born in North Africa. Among the JP2 isolates from the non-Africans six could be traced to North Africa and the remaining one to West Africa. Genetic variability among the tested JP2 clonal isolates was not detected.

**Conclusion:** The highly virulent JP2 clone of *A. actinomycetemcomitans* seems to be more spread among individuals of non-African origin than earlier reported.

Topic: Clinical Research: Diagnosis and risk factors

**P0667**

### Holographic evaluation of gingival retractions

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Timisoara/Romania

**Aim:** Holographic evaluations count among very recent measurement tools in orthodontics (Kau & Richmond 2008) and prosthodontics (Zhang & Zhang 2006). This paper introduces holography as an assessment method of tridimensional variations of gingival tissue losses caused by periodontal disease.

**Material and Methods:** The retractions of the gingival margins on maxillary frontal regions of five patients affected by chronic periodontitis were measured in six points with a periodontal probe and was additionally evaluated by holographic methods using a He-Ne laser of 1mV (Superlum, Carrigtwohill, Ireland) inside a holographic bank of 200x100 cm. Impressions were taken during the first visit and cast models were manufactured. Six months after the end of the periodontal treatment, clinical measurements were repeated and the hologram of the first model was superposed on a final model cast, by using pre-established reference points, while maintaining the optical geometric perimeters. The retractions of the gingival margins were evaluated three-dimensionally in every point of interest by using a dedicated software (SigmaScanPro, Systat Software, San Jose, CA, USA). Wilcoxon non-parametric test was used to compare the mean gingival recession changes between baseline and six months after the end of the treatment, and between the values measured in vivo and the values measured on the hologram.

**Results:** There were no statistically significant differences between the values measured in vivo and the values measured on the hologram.

**Conclusion:** Holography provides a valuable tool to measure the gingival retractions on virtual models. Data resulted from the evaluations can be stored, reproduced, transmitted and compared at a later timepoint, by maintaining the accuracy of the measured details.

Topic: Clinical Research: Diagnosis and risk factors

**P0668**

### Infrabony defects outcomes and healing process after impacted third mandibular molar extractions in young adults

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Santiago De Compostela/Spain

**Aim:** Estimate the prevalence of preoperative infrabony defects and their healing at distal surface of second mandibular molar (2Mm) after impacted third mandibular molar (3Mm) extraction, in young adults for a 12-months postoperative period.

**Material and Methods:** Prospective clinical study in 22 young healthy patients (21.03±4.51 years), performing 37 extractions of higher-risk periodontal impacted 3Mm. Radiographic Bone Height (RBH), Radiographic Infrabony Defect (RID), Bone Loss (BL) and categorized RID were recorded before surgery, at 3, 6 and 12 months.

**Results:** Differences were statistically significant for RBH and RID between all assessments ( $p < 0.05$ ). At 12 months an average recovery of  $2.80 \pm 2.36$  mm ( $p < 0.001$ ) was recorded, with RID average of  $1.78 \pm 1.65$  mm. Bone healing was higher at the first 3 months ( $1.3$  mm,  $p < 0.01$ ). RID  $\geq 4$  mm with moderate/mild BL decreased to  $\leq 3$  mm without BL, but initial RID  $\leq 3$  mm without BL worsened to mild BL at 12 months after surgery. In moderate BL, the bone gain pattern is gradual and continuous, whereas in mild BL it is variable.

**Conclusion:** An impacted 3Mm adjacent to a 2Mm leads to a RID  $\geq 4$  mm with mild/moderate BL that practically recovers after 12 months post-surgery. The first 3 months follow-up represents the cut-off for alveolar bone healing.

Topic: Clinical Research: Epidemiology and delivery of care

**P0669**

### Evaluation of periodontal state in Polish population - an epidemiological study

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**Aim:** The assessment of prevalence and severity (CPI - Community Periodontal Index) of PD's and Treatment Needs (TN) in the studied population.

**Material and Methods:** Epidemiological studies were conducted on 1238 randomly selected adult Poles, aged 35-44 years. Several academic dental centers were involved into study: Białystok, Kielce, Lublin, Szczecin, Warsaw, Wroclaw. CPITN index was determined in the studied individuals. Results were subjected to statistical analysis.

**Results:** The data obtained revealed that only 1,7% of the study group didn't need prophylaxis and treatment measures (CPI-0), 16,7 % of the population studied required oral hygiene training (OHT) and removal of biofilm (CPI-1), 26,7% required OHT and supragingival scaling (CPI-2), 36,4 % OHT, supragingival and subgingival scaling (CPI-3). 18,6 % of the group studied required a comprehensive periodontal therapy (CPI-4). Sex had no influence to the study results.

**Conclusion:** These results indicate the need to undertake immediate measures, requiring not only the collaboration between dentists, dental hygienists and periodontists, but also developing the patients' willingness to co-operate with the dental team.

Topic: Clinical Research: Epidemiology and delivery of care

**P0670**

### The prevalence and distribution of periodontal disease in Japanese adults, covering 25 years.

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Tokyo/Japan

**Aim:** The present investigation describes prevalence and distribution of periodontal diseases in a Japanese population over the 25 years.

**Material and Methods:** In 1981-1984, a cross-sectional epidemiological study was performed in city of Ushiku in Japan. Another cross-sectional study was performed in city of Takahagi in 2009-2010. Both cities belong to Ibaraki prefecture that is situated about 50 km outside Tokyo. Random selection among 20-79 years old inhabitants in Ushiku or Takahagi cities. The selections were made at the city registrar by the city officials. The clinical examinations were performed. Diagnostic criteria were number of teeth, plaque, bleeding on probing, probing pocket depth, and clinical attachment level.

**Results:** In all age groups, the number of teeth increased. Number of surfaces which harbouring plaque and bleeding on probing decreased considerably over the 25 years. However mean probing depth and clinical attachment levels remained unchanged.

**Conclusion:** Oral hygiene and gingival inflammation improved significantly in the 20-79 year age groups over the 25 years. However, with respect to mean probing depth and clinical attachment level, such improvement was not found.

Topic: Clinical Research: Epidemiology and delivery of care

**P0671**

### Prevalence of Gingival Recessions in Chronic Periodontitis Patients: A Retrospective Study

A. Soanca, C. Cioban, C.I. Bondor, A. Roman

Cluj-Napoca/Romania

**Aim:** Miller class III and IV gingival recessions (GRs) are a sign of periodontal disease, being associated with esthetic and functional alterations. Periodontitis patients may also harbor class I and II GRs. The treatment of GRs often implies complex approaches. The aim of this study was a retrospective analyze of the GRs prevalence in a group of chronic periodontitis patients

**Material and Methods:** Forty chronic periodontitis patients, 14 females and 6 males, with the age average of 37 (SD 1.3) years were evaluated in this study. The complete periodontal examination chart was investigated for each patient and all Miller classes of GRs were taken into consideration. The statistical analysis calculated the prevalence of each type of GRs, the gender, tooth distribution, the mean values of the height and the width of GRs, using SPSS (v. 16) and SYSTAT v.12.

**Results:** A number of 948 teeth were examined from which 472 (49.70%) presented GRs. Only 38.89% of GRs were Miller class III and IV type and 61.11% were Miller class I and II type. The most frequently affected teeth were the inferior incisors (6.16%), followed by the first maxillary incisors (5.84%) and mandibular first premolars (4.86%).



**Conclusion:** In this chronic periodontitis group the most frequently recorded GRs were Miller class I and II type. When they are located on the buccal surfaces, they could be successfully treated, managing the prejudices associated with these types of GRs. For the rest of GR types only a partial recovery could be achieved.

Topic: Clinical Research: Epidemiology and delivery of care

## P0672

### Frequency of root-filled teeth and quality of endodontic treatment in a chronic periodontitis population: a retrospective analytical study

C. Cioban, A. Soanca, A. Petrutiu, D. Condor, A. Roman

Cluj-Napoca/Romania

**Aim:** The treatment of periodontal disease is directed towards the primary etiologic factor that is bacterial biofilm; sometimes the periodontal therapy must also resolve the associated iatrogenic problems. This retrospective study aims to evaluate the frequency of endodontic treatment in chronic periodontitis patients and to identify the quality of the canal treatment.

**Material and Methods:** Twenty patients, aged between 25 to 65 years, diagnosed with medium chronic periodontitis were investigated. For all the subjects panoramic and seriate periapical radiographs were evaluated. The presence of root fillings, the quality of root fillings (optimal length, uniform opacity and adequate adaptation) and the presence of periapical lesions were recorded. Data were statistically analysed with SPSS (Statistical Package for Social Sciences) for Windows 10.0 statistical package software.

**Results:** From the total number of 510 examined teeth, 9.8% were endodontically treated, out of which 64% were treated incorrectly. The prevalence of endodontic treated teeth was 90%. Regarding the cause of failure, 26 teeth (52%) were underfilled and 6 teeth (12%) were overfilled. Apical pathology was found in 8 teeth with underfilling that is 25% from all uncorrected teeth or 30.7% from underfilled teeth.

**Conclusion:** In the present study, the frequency of incorrect endodontic treatment in chronic periodontitis patients was high. On the other hand, periapical periodontal lesions due to incorrect endodontic treatment may lead to teeth loss in this category of patients for which the number of teeth is already affected by periodontal disease.

Topic: Clinical Research: Epidemiology and delivery of care

## P0673

### Periodontal health in vegetarians – a controlled clinical trial

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Hannover/Germany

**Aim:** Aim of this clinical trial was to investigate the influence of a vegetarian diet on periodontal parameters.

**Material and Methods:** A total of 200 patients, 100 vegetarians

and 100 non-vegetarians, were included in the study. All patients were examined once including a full mouth assessment of the periodontal condition. In addition, a questionnaire was handed out to ask for patients' oral hygiene habits and level of education. For statistical analysis the Mann-Whitney-Test (Chi-Square-Test for analysis of the questionnaire) was applied (level of significance:  $p < 0.05$ ).

**Results:** Well-known periodontal risk factors like age, gender and smoking habits were equally distributed within each group (71 females, 29 males respectively & 10 smokers in each group; mean age: 41.45 years vegetarians vs. 41.72 years non-vegetarians). Vegetarians had significantly lower probing pocket depths ( $p = 0.039$ ), bleeding on probing ( $p = 0.001$ ), papilla bleeding index ( $p < 0.001$ ), periodontal screening index ( $p = 0.012$ ), missing teeth ( $p = 0.018$ ), and mobile teeth ( $p = 0.013$ ). In addition, vegetarians had a significantly better hygiene index ( $p < 0.001$ ), frequency of oral hygiene procedures ( $p = 0.036$ ) as well as a higher level of education ( $p < 0.001$ ).

**Conclusion:** Vegetarians revealed better periodontal conditions compared to non-vegetarians. However, it needs to be kept in mind that vegetarians are not only avoiding meat in their diet but are also characterized by an overall healthier life style.

Topic: Clinical Research: Epidemiology and delivery of care

## P0674

### Early oral health care program starting during pregnancy - Clinical long-term study - phase V

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Hannover/Germany

**Aim:** Objective of this clinical investigation was to analyze the effects of a long-term prevention program starting during pregnancy on dental and oral health of young adolescents aged 18-19 years.

**Material and Methods:** The entire study was subdivided into five phases. Phase I: during pregnancy; phase II: mothers and their young children until the age of 3 years; phase III: mothers and their children until the age of 6 years; phase IV: 13- to 14-year-old teenagers and in phase V the oral health of 18-19-years-old adolescents was examined ( $n = 26$ , age:  $18.34 \pm 0.4$  years). All phases consisted of an examination, education about oral health care, and treatment based on the concept of an "early oral health care promotion". The control group consisted of randomly selected adolescents at the same age ( $n = 35$ , age:  $18.64 \pm 3.6$  years). The following clinical parameters were assessed: DMF-T/S, HI, PBI and PSI. The Data were evaluated statistically by using the t-test and chi-square-test, SPSS ( $p < 0.05$ ).

**Results:** The young adolescents of the "prevention" group of phase V revealed a share of 92.3% caries-free dentitions (65.4% sound; 26.9% caries-free with fillings). Mean DMF-T was  $1.35 \pm 2.60$ . The control group showed a significantly higher mean DMF-T of  $3.83 \pm 3.20$  ( $p < 0.05$ ) and revealed 71.4% of caries-free dentitions (22.9% sound, 48.5% caries-free with restorations). The prevention group showed a significant lower PSI of  $1.5 \pm 0.78$  compared to the control group ( $2.11 \pm 0.40$ ) ( $p < 0.05$ ).

**Conclusion:** Our data clearly document that an "early oral health care program" starting during pregnancy may cause a sustained and long-term improvement of the oral health of young adolescents.

## Topic: Clinical Research: Epidemiology and delivery of care

**P0675****Bacteria associated with periodontitis in Swiss adolescents**

S. Eick, M. Pietkiewicz, A. Sculean

Bern/Switzerland

**Aim:** The purpose of the study was to determine the prevalence of different oral microbes in gingival plaque samples and in samples from the dorsum of the tongue in a Swiss adolescent population.

**Material and Methods:** Ninety-nine adolescents between 15 and 18 years were enrolled. Plaque index, bleeding on probing (BOP), the periodontal screening index (PSI) and decayed missed filled tooth (DMFT) index were recorded. Samples from subgingival plaque and swabs from the tongue were analyzed by the Checkerboard DNA-DNA hybridization method. Additionally, counts of *Streptococcus mutans* and *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis*, *Tannerella forsythia*, and *Treponema denticola* were determined by real-time PCR.

**Results:** Periodontitis was not diagnosed in any of the subjects. All adolescents had gingival inflammation; the mean BOP was 28%. Ten (10.1%) subjects were tested positive for *P. gingivalis*, each 22 (22.2%) for *A. actinomycetemcomitans* and *T. forsythia*, 47 for *T. denticola*. *T. denticola* and *S. mutans* showed a high affinity to the gingival plaque whereas *T. forsythia* was often detected from tongue. DMFT was associated with *S. mutans* counts and BOP correlated with counts of *P. gingivalis* and *T. denticola*.

**Conclusion:** The present data indicate that: a) Gingivitis but not periodontitis is a common finding among Swiss adolescents and b) Bacteria associated with periodontitis were frequently detected in the subgingival dental plaque and on the dorsum of the tongue in Swiss adolescents with gingivitis.

## Topic: Clinical Research: Epidemiology and delivery of care

**P0676****Periodontal disease awareness among patients attending Istanbul University Periodontology Department in Istanbul, Turkey.**

U. Baser, M. Gemen, H.E. Dogru, B. Ozerol, F. Yalcin, U. Onan, H. Issever

Istanbul/Turkey

**Aim:** The purpose of this study was to assess periodontal disease prevalence and distribution along with periodontal disease awareness and oral hygiene practices of patients applying for treatment at Istanbul University Faculty of Dentistry, Periodontology Department.

**Material and Methods:** 674 patients were randomly selected. The distribution of gender was 61% female and 39% male, the average of age was 36 and smoking patients were 23% in the selected population. Oral and systemic anamnesis were performed and a questionnaire form was used to assess periodontal disease awareness. Clinical recordings included Aproximal Plaque Index(API), Bleeding on probing (BOP), community periodontal index of treatment need (CPITN), Pocket Depth(PD), migration (M) and gingival recession(GR). Patients were divided into two

groups by comparing disease awareness.

**Results:** CPITN code 2 was the most common score of the patients. The assessment of oral hygiene practices showed that interproximal surface cleaning was insufficient among patients. Periodontal disease awareness was 44% among patients but the comparison of age, gender and clinical parameters between the patients who were aware and who were not aware, did not show any significant difference. There was a significant difference when the two groups were compared according to the pockets deeper than 4 mm (p

**Conclusion:** Our findings indicate that the majority of patients were referred to the periodontology clinic by a dental professional and disease awareness was low among patients.

## Topic: Clinical Research: Epidemiology and delivery of care

**P0677****Epidemiology of Oral Malignant Neoplasms in Northern Portugal**

C. Tavares, D. Costa, F. Coimbra, R. Faria-Almeida, J. Guimarães

Porto/Portugal

**Aim:** The ability to recognize oral malignant neoplasms is of extreme importance to a dentist, since he is, in many cases, the first person that might identify the disease. The lack of epidemiological data on the behavior of oral malignant neoplasms in the Portuguese population justifies the main objective of this study: quantify the frequency of this pathology in the north of Portugal, allowing the identification of the individuals in risk.

**Material and Methods:** 1041 patients with the diagnosis of oral malignant neoplasm (C00 to C06) with histological confirmation, that were diagnosed from 1st January 2004 to 31st December 2006 in Oporto Oncology Portuguese Institute (IPO-Porto) were included in the study.

**Results:** Males were the most affected gender in a proportion of 1:3. There is an increase in the prevalence of oral carcinoma in the 5th decade (19,69%) and a progressive decline after the 7th decade. The most affected region of the oral cavity is the tongue (30,16%) followed by the floor of the mouth (17,48%). The most prevalent histological entity was squamous cell carcinoma (SCC) (93,37%). Concerning the stage of the neoplasm most cases were in stage IV (26,75%). The prevalence of smoking and alcohol consuming population was higher in the floor of the mouth neoplasms than in the lip neoplasm.

**Conclusion:** The epidemiological profile of oral malignant neoplasm in IPO-Porto population is similar to the existing literature.

## Topic: Clinical Research: Epidemiology and delivery of care

**P0678****Periodontal status in patient with posttraumatic stress disorder**

S. Lončar, I. Puhar, S. Štrkalj-Ivezić, S. Srečko, D. Vražić, A. Badovinac, D. Božić

Zagreb/Croatia

**Aim:** The aim of this epidemiological study was to determine the periodontal status of patients suffering from posttraumatic stress disorder (PTSD), and to compare it to a specific group, also a war veterans who never developed PTSD.

**Material and Methods:** The study included 159 male war veterans subjects. 93 of them comprised the test group of patients with PTSD (47.7 years), and 66 of the subjects were the psychiatrically healthy control group (46.6 years). All of them were exposed to war stress, but the subjects in the control group never sought psychiatric help. Subjects were divided according to the general anamnestic data, and periodontal measurements were recorded (API, BOP, PD, RE, CAL).

**Results:** Considerably worse periodontal status was found in the test group compared to the control group regarding the following measurements - API (83,3 vs. 37,9%), BOP (86,9 vs. 49,8%), PD (3,63 vs. 2,65 mm), RE (2,91 vs. 1,80 mm), CAL (6,14 vs. 4,10 mm). In addition, PTSD patients had fewer teeth present (23.67 vs. 26,11 teeth). The percentage of smokers in PTSD group was also higher (61,3 vs. 27.3%).

**Conclusion:** Negative influence of smoking and the improper oral hygiene were partly responsible for considerably worse periodontal status of the examinees in the PTSD group. The obtained results clearly show that the persons with PTSD can be considered the risk group for progression of periodontal disease, and that they need an increased prevention measurements and education about the importance of their oral health.

Topic: Clinical Research: Epidemiology and delivery of care

**P0679**

### First phase and supportive periodontal therapy: predictors of compliance

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**Aim:** a) To identify predictors of 1st phase periodontal therapy initiation or completion as well as supportive periodontal therapy (SPT) compliance and b) to define the critical time point that a periodontal patient becomes erratic with SPT.

**Material and Methods:** Data (age, gender, referral, chief complaint, smoking, health condition, periodontal disease severity) of 433 consecutive new patients in a periodontal private practice were analyzed in multivariate models with therapy initiation/completion as well as SPT compliance used as dependent variables

**Results:** Of 433 patients (mean age 47,9±13,4 years), 17,3% never initiated phase I therapy, 10,9% never completed therapy, and 21,5% completed treatment but never entered SPT. Of the 218 SPT patients, 56% stopped after a period of 20 months, 33% were erratic attenders (at least one interval between maintenance appointments >6 months) and 10,5% were regular attenders until the end of the observation period. Patients became erratic attenders, after a mean period of regular attendance of 18,1±16,2 months, whereas 49,6 % of the patients who stopped SPT were regular attenders until the time they stopped. In a logistic regression model none of the independent variables emerged as significant predictor of either initiation or completion of periodontal treatment (p>0,05). The multivariate linear regression model with SPT duration as dependent variable revealed that severity of periodontal disease emerged as a positive predictor (p<0,001), whereas age and smoking severity emerged as negative predictors (p=0,022, p=0,003 respectively).

**Conclusion:** Age, smoking status and periodontal condition were identified as significant predictors of compliance to SPT.

Topic: Clinical Research: Epidemiology and delivery of care

**P0680**

### Periodontal treatment awareness among patients attending Istanbul University, Periodontology Department in Istanbul, Turkey.

U. Baser, H.E. Dogru, S. Kaya, B. Ozerol, F. Yalcin, U. Onan, H. Issever

Istanbul/Turkey

**Aim:** Many people neither recognize the symptoms of periodontal disease nor do they associate existing symptoms with the disease. Furthermore, patients do not fully realize the benefits of periodontal treatment. The purpose of this study was to assess periodontal treatment and oral hygiene practices awareness of the patients receiving treatment at Istanbul University Faculty of Dentistry, Periodontology Department.

**Material and Methods:** 674 patients were interviewed by questionnaire about their oral hygiene behaviour, their knowledge about periodontal diseases and their opinion concerning prophylaxis and therapy of periodontitis. Pocket depth, visible plaque, bleeding on probing and Community Periodontal Index of Treatment Need (CPITN) was measured at each tooth by clinical examination. Then the clinical data were examined for possible correlation to socioeconomic factors, gender or behaviour and knowledge of the subjects. The questionnaire was also used to scale periodontal treatment and oral hygiene practise awareness.

**Results:** Periodontal treatment awareness was 42% among patients. When patients were questioned periodontal treatment benefits: 91% of the patients considered the treatment was beneficial, 3% was not beneficial and 6% had no idea whether beneficial or not. 77% of the patients point out that they had more useful oral hygiene instructions during treatments than previous.

**Conclusion:** The subjects examined were interested in oral health, but their clinical data indicated that motivation or knowledge was not converted sufficiently into practice.

Topic: Clinical Research: Epidemiology and delivery of care

**P0681**

### Evaluation of an antiseptic efficiency on skin disinfection by ATP quantification.

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Nancy/France

**Aim:** The aim of this study was to evaluate a rapid method for detecting bacterial ATP present on the skin around the mouth and to evaluate the action of an antiseptic before oral surgery.

**Material and Methods:** Twenty-five persons (20 to 52 year-old males and females) were included in this study to evaluate the effect of antiseptic disinfection before oral surgery. The quantity of bacteria was subjected to adenosine triphosphate- (ATP-)

driven bioluminescence evaluations using a luciferase-based assay system. One side of the skin around the mouth was cleaned with an antiseptic (gluconate de chlorhexidine 0.25%, benzalkonium chlorure 0,025%, benzoic alcool 4%) and the other was the control.

**Results:** The desinfected side showed a significant decrease of the quantity of ATP (44.3% and 49.4% respectively for male and female groups) in comparison with the control side. The male group presented a significantly higher quantity of ATP on the control and test sides than the female group did.

**Conclusion:** The ATP seems to be a useful tool to evaluate the action of an antiseptic on skin around the mouth.

Topic: Clinical Research: Epidemiology and delivery of care

## P0682

### High prevalences of periodontal inflammation and severe periodontitis are observed in Madagascar's population

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**Aim:** Epidemiological studies performed around the world have shown a great variability of periodontal disease prevalence and severity. The aim of this study was to determine the specificity of the periodontal status of Vakinankaratra's population in Madagascar and consequently the treatment needs.

**Material and Methods:** An epidemiological descriptive study was carried out in this region, from March 2011 to June 2011 about 200 subjects of 18 years old at least and having more than 10 teeth. General information, periodontal status, papillary bleeding and plaque index, clinical attachment loss (CAL) and periodontal probing depth (PPD), and oral hygiene level were recorded. Severe periodontitis definition corresponded to at least three sites on different teeth with a CAL > 7 mm.

**Results:** All the subjects had a periodontal disease. Gingivitis concerned 40% of the studied population. The global prevalence of severe periodontitis was 35.5% and 4.5% in young subject (<25 years old). The mean papillary bleeding index was  $1.57 \pm 0.4$ , and  $2.61 \pm 0.7$  in case of severe periodontitis. The mean values of PPD and CAL were respectively  $1.04 \pm 1.1$  mm and  $0.88 \pm 1.4$  mm and increased with age. The other risk factors were education level, matrimonial situation, current smoking, and especially oral hygiene. Indeed, the mean index plaque was  $64.8 \pm 21.1\%$  and 40% of subjects had an index plaque more than 75%.

**Conclusion:** The result showed that a large part of the studied population was affected by severe periodontal diseases with a high level of inflammatory response. These data highlight the necessity to develop oral hygiene education and prevention measures of periodontal diseases in this population.

Topic: Clinical Research: Epidemiology and delivery of care

## P0684

### Comparison of periodontal status of adult Poles to the results of epidemiological studies in the United States

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**Aim:** To present the periodontal health status of adult Poles and comparing them to the most modern available research of the population of Americans at the same age.

**Material and Methods:** As a result of a two-layer sampling, a group of 12 thousand people aged 35 to 44 years was chosen (2000 for each of the six research centers: Warszawa, Wrocław, Szczecin, Białystok, Lublin, Kielce). A total 1,169 individuals were reported for the research. The clinical study evaluated bleeding on probing (BoP) index, probing depth (PD) and clinical attachment lost (CAL) in four measuring sites per tooth (112 measuring sites in a fully dentate person).

**Results:** The mean value of BoP index was 32.5% (higher in men 35.3 vs. 30.2%). The percentage of people with BoP > 10% was 83.9% (higher in men 85.2 vs. 82.8%). Average pocket depth was higher in men (2.33 vs. 2.08). There was a significant correlation between PD and education, income, smoking and genetic load. At 88.2% of the adults at least one measuring site with 1 mm loss of clinical attachment was observed. The percentage of persons with periodontal pockets of 5 mm and deeper was 19.2% (more common in men 25.4 vs. 13.9%). Periodontitis was diagnosed in 19.2% of persons, of which 10.1% had severe form.

**Conclusion:** Periodontal status of adult Poles is worse than American adults. A high percentage of Poles aged 35 to 44 years with periodontitis may contribute to the frequent occurrence of cardiovascular diseases later in life.

Topic: Clinical Research: Epidemiology and delivery of care

## P0685

### Evaluation of the etiological agents in the aggressive periodontitis and its correlation with IL-1a and IL-1b - genotype in Portugal- a 6 year prospective study.

S.M. Perdigoto, N.M. Vasques, A. Venâncio

Caldas Da Rainha/Portugal

**Aim:** 1 - Evaluate the association between aggressive periodontitis and *Aggregatibacter actinomycetemcomitans* (Aa), *Tannerella forsythia* (Tf), *Porphyromonas gingivalis* (Pg), *Prevotella intermedia* (Pi), *Treponema denticula* (Td) and *Campylobacter*



rectus(Cr). 2-Examine the association between polymorphism of IL-1a and IL-1b and titers of selected bacterial pathogens in patients with aggressive periodontitis.

**Material and Methods:** Subgingival plaque of 183 European Caucasian subjects, with aggressive periodontitis living in the West region of Portugal, was analysed. Microbiological tests were done using PCR, and genetic tests were done using PCR RFLP method

**Results:** -In the early aggressive periodontitis, the most common bacteria was Tf, (82 % of the cases) . -In moderate aggressive periodontitis, Tf, Pg were the most common. -In the most severe cases, the bacteria found in a significant number was Tf , and when the Aa was detected, subjects tend to present deeper periodontal pockets and bigger bone destruction.

**Conclusion:** Analysing the results, the most common bacteria found was Tf and Pg. When Aa was present, a bigger bone destruction was observed. Subjects presented deeper pockets. 60% of the subjects didn't present IL1a and IL1b polymorphism, which might suggest that for the population analysed this test had no correlation with Aggressive Periodontitis.

Topic: Clinical Research: Epidemiology and delivery of care

**P0686**

### Association of gingival recession to dentine sensitivity and non-carious cervical lesions in periodontal patients in Trinidad

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**Aim:** To investigate gingival recession, dentine sensitivity and non-carious cervical lesions (NCCL) occurrence among periodontal patients at School of Dentistry, UWI.

**Material and Methods:** In 2008, consecutive periodontal patients had a full periodontal assessment and an interviewer administered questionnaire. Clinically probing depths, recession, symptoms of dentine sensitivity and NCCL were recorded for all teeth (2929 teeth). Three recession groups were noted: R1 (Mild; 1, 2, 3, mm), R2 (Moderate; 4, 5, 6 mm), R3 (Severe; >7 mm).

**Results:** The sample included 130 patients (41% males; 59% females). Ethnicities were 40% African, 34.6% East Indian and 25.4% of mixed descent. The mean site gingival recession was  $1.56 \pm 1.42$ . Mean gingival recessions for all six sites were significantly greater among Indo-Trinidadians versus Afro-Trinidadians ( $p < 0.05$ ). Numbers in the recession groups were R1: 19 (14.6%), R2: 71 (54.6%) and R3: 40 (30.7%). There were 57.8% with dentine sensitivity in the R1 group, 80.2% in the R2 group and 80% in the R3 group. For NCCL lesions, there were 26.3% in R1, 39.4% in the R2 and 42.5% in the R3 group. Afro-Trinidadians ( $n=43$ , 82.6%) reported higher dentine sensitivity compared to Indo-Trinidadians ( $n=34$ , 75.5%). There were similar NCCL reports among Afro-Trinidadians ( $n=18$ , 34.6%) and Indo-Trinidadians ( $n=16$ , 35.5%). Among all patients, past use of a hard to medium toothbrush was reported by 94.3% Afro-Trinidadians and 86% of Indo-Trinidadians.

**Conclusion:** Increased gingival recession is associated with higher percentages of dentine sensitivity and NCCL. Indo-Trinidadians, compared to Afro-Trinidadians, had more severe recession but conversely less dentine sensitivity. Multiple predisposing factors may require investigation.

Topic: Clinical Research: Epidemiology and delivery of care

**P0687**

### Perception of Patients' Own Smiles, Beautiful or Healthy?

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Bahcelievler/Turkey

**Aim:** The aim of this study is to investigate patients' satisfaction with their own smiles and to determine the role of some aspects such as alignment of teeth (crowding, diastemas, displacement of teeth), and appearance of gums (recession, overgrowth, gummy smile) or teeth (color, shape, deposits on surfaces) on self-perception of smile.

**Material and Methods:** Satisfaction with appearance of teeth and gums were assessed on a 100 mm visual analog scale (VAS) bar. Fifty-three participants (41 females, 12 males) judged their smile with a questionnaire.

**Results:** Patients' satisfaction with their own smiles were  $57 \pm 31$  (mean value  $\pm$  standard deviation) on VAS. They were most satisfied with the alignment of their teeth ( $61 \pm 31$ ), and least satisfied with the appearance of their gums ( $52 \pm 31$ ) when smiling. Importance degree of having tooth displacement was  $58 \pm 37$  for their esthetics, while  $68 \pm 31$  for their comfort standard. Gingival recession, gingival overgrowth, and gummy smile were affecting their smile with a value of  $69 \pm 29$ ,  $72 \pm 35$ , and  $74 \pm 30$ , respectively. Number of participants aware of having plaque/calculus on teeth surfaces were 77.4% and impact of presence of plaque/calculus on their smile was  $56 \pm 33$ . Finally, participants rated in favor of health ( $79 \pm 21$ ), rather than esthetics for a perfect smile in general.

**Conclusion:** The results of this study indicate that dental and periodontal health is more valuable in perception of individuals' own smiles, rather than esthetics.

Topic: Clinical Research: Epidemiology and delivery of care

**P0688**

### The prevalence of osseous defects during the course of Chronic Periodontitis

E.D.F. García, M.R. Sánchez De La Nieta

Salamanca/Spain

**Aim:** The aim of this study is to show the prevalence of the located osseous defects such as crater, hemiseptae, one, two, three or four wall defects which commonly appear during the course of the Chronic Periodontitis in adults.

**Material and Methods:** All the study was carried out at the Surgery Department of the Alfonso X "El Sabio" University and UIC college. All the subjects in the study were free of systemic conditions and were non-smokers. The patients were examined by a trained clinician who classified the osseous defects found in the surgery according to the anatomy and severity of them.

**Results:** Despite not having finished the study yet , we could certainly think that the distribution of those defects would be: crater as the most associated among chronic periodontal patients., being the percentage: crater (38%), 1 wall (28%), 2 wall (6%),

3 walls (10%) and 4 walls (18%). However, it must be said that more accurate figures could be expected as the study is still developing.

**Conclusion:** The study is still developing.

Topic: Clinical Research: Epidemiology and delivery of care

## P0689

### Referral processes at two hospital-based specialist periodontal units

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<sup>1</sup>Glasgow/United Kingdom, <sup>2</sup>Malmö/Sweden

**Aim:** To examine the referral process by describing structure and match of referrals and reply letters at two specialist dental care units in Scotland and Sweden.

**Material and Methods:** Data was obtained from correspondence relating to patients referred to Periodontology Departments in Glasgow, Scotland and Malmö, Sweden. Fifty referrals and subsequent reply letters were selected for assessments using a preformed questionnaire.

**Results:** The majority of the referrals were written by general dentists. The most frequent reason for the referral was 'observed pathology,' followed by 'observed disease progression.' The patients' major complaint was mainly (70%) pain or swelling from the gums. In 20% of the referrals no diagnosis was given. Referrals with diagnosis were 8 times more likely to be closed by a reply letter giving a diagnosis.

**Conclusion:** Basic rules for communication seem to apply for the referral process between general and specialist dentists. The more specific the question the more specific the answer. Although improved communication between general and specialists dentists seems likely to improve patient care, further investigation would be required to determine the details and extend of this influence.

Topic: Clinical Research: Epidemiology and delivery of care

## P0690

### Biological response in diabetic patients versus healthy patients mechanical periodontal treatment.

N. Goenechea, M.C. Feijoo, J. Delgado Gregori

Toledo/Spain

**Aim:** Diabetes mellitus is a chronic systemic disease due to a deficit of production and/or activity of insulin, which affects about 2-5% of the population. In addition to the chronic complications (vascular, renal, ophthalmological, neurological and others) and acute complications (hyperglycemic coma and hypoglycemic coma), diabetes complications produces a series of oral level among which are: periodontitis, delayed healing, xerostomia, oral ulcers, toothache atypical, sialomegalia, increased incidence of dry socket, fissured tongue, angular cheilitis, lichenoid reactions and more frequent candidiasis.

**Material and Methods:** 30 diabetic patients and 30 healthy patients diagnosed in the Master of Oral Surgery, Implantology

and Periodontics of the UAX, of initial and moderate chronic periodontal disease (up to 6 mm pockets). They will receive basic periodontal treatment and oral hygiene instructions and the month will be re-evaluated to assess and compare the response of the tissues.

**Results:** in progress

**Conclusion:** in progress

Topic: Clinical Research: Epidemiology and delivery of care

## P0691

### Chief complaints of patients seeking treatment for periodontitis in Morocco.

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Casablanca/Morocco

**Aim:** Hardly any data are available concerning the chief complaints (CCs), of patients with periodontitis. We conducted a study to determine the most common CCs among a group of subjects with periodontitis.

**Material and Methods:** We examined the dental records of 100 patients with periodontitis to determine what CCs they orally reported having at an initial examination. 49% of the patients were diagnosed with aggressive periodontitis. We recorded the frequency of different CCs to determine the most common complaints.

**Results:** We recorded 205 CCs from the records of 100 subjects with periodontitis. There were 21 different CCs. The most common CC reported was bleeding gums (45.5%), followed by the mobility (29.9%) and the pathologic tooth migration (24.7%).

**Conclusion:** We found that patients consult rarely for control (1%). Furthermore, tooth mobility and tooth migration are both considered symptoms of severe periodontitis, and they were reported frequently as a CC in our study.. Renewed efforts and increased responsibility of the dental health team members to inform patients about the presence of periodontitis are needed, as well as emphasizing to the public the risk of losing teeth as a result of periodontitis.

Topic: Clinical Research: Epidemiology and delivery of care

## P0692

### The prevalence of gingival recession among patients of Lagos University Teaching Hospital: A preliminary survey

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Lagos/Nigeria

**Aim:** To determine the prevalence of gingival recession and its associated aetiological factors and features in an adult population.

**Material and Methods:** Subjects were selected from patients attending the Periodontology clinic of the Lagos University Teaching Hospital. Eighty-two subjects were consecutively

interviewed using a structured questionnaire and full-mouth clinical examination. Gingival recession was scored in the presence of free gingival margin apical to the cemento-enamel junction.

**Results:** The study was made up of 39 males (47.6%) and 43 females (52.4%). The age range was 17-67 years with a mean of 39.2+/-17.9 years. Twenty-five (38%) patients had gingival recession on one or more teeth. Of these, 52%(n=13) were males and 48% (n=12) were females. Of the 188 teeth affected, 153 (81.4%) were buccally involved. There was no association with cigarette smoking. The use of the horizontal toothbrushing method was prevalent among the subjects (n=42, 51.2%), with no statistically significant difference between those with recession and those without recession (p=0.4463). Miller's Grade 1 gingival recession was the most common finding. The presence of dentine sensitivity in affected subjects was statistically significant (p=0.0251). Cervical abrasion was a statistically significant finding (p=0.0074) associated with gingival recession.

**Conclusion:** In this survey, the prevalence of gingival recession was found to be fair, with no obvious sex predilection. The study has highlighted the significant occurrence of dentine sensitivity and cervical abrasion in association with gingival recession. This is of concern and indicates that efforts to prevent gingival recession need to be emphasized in order to avert these conditions and their problems of discomfort and compromised aesthetics

Topic: Clinical Research: Epidemiology and delivery of care

## P0693

### Social nicotine dependence and periodontal condition: a study of two groups of Romanian dental students

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<sup>1</sup>Timisoara/Romania, <sup>2</sup>Bucharest/Romania, <sup>3</sup>Nagoya/Japan, <sup>4</sup>Iasi/Romania

**Aim:** Because of the high prevalence of smoking among Romanian students, the study aimed at determining the smoking status, social nicotine dependence, periodontal condition and oral hygiene in dental students.

**Material and Methods:** 99 first-year (36.4% smokers) and 124 sixth-year (33.9% smokers) Romanian dental students from the same university participated in this cross-sectional study. The Kano Test for Social Nicotine Dependence (KTSND) questionnaire was used for assessing the social nicotine dependence. Questions regarding age, gender, personal smoking experience and smoking status were included. Smokers were asked additional questions (stages for quitting, number of cigarettes/day, the time until the first cigarette of the day). The periodontal status was assessed using the Community Periodontal Index (CPI).

**Results:** KTSND scores were statistically significant higher in smokers than in non-smokers in both groups. Although the sixth-year students were more aware of the physicians' role in smoking cessation, they believed stronger in smoking being part of culture and denied more that smoking is a disease. Poor oral hygiene and gingivitis were statistically significant more prevalent in the first-year students than in the sixth-year students in three sextants. Gingivitis was statistically significant more prevalent in junior-year smokers: upper right sextant (97%vs74%, p=0.004); lower right sextant

(97%vs76%, p=0.008); lower anterior sextant (100%vs78%, p=0.003); lower left sextant (100%vs74%, p<0.001).

**Conclusion:** Results indicate a better periodontal condition of last-year students, while several attitudes towards acceptance of smoking were different from junior-year students. Implementing combined oral health and tobacco control programs, with specific targets on first- and sixth-year students, might lower not only the prevalence of smoking, but also the social nicotine dependence among dental students and future dentists, too.

Topic: Clinical Research: Epidemiology and delivery of care

## P0695

### The illusion of a standardised case definition in periodontal research

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Dunedin/New Zealand

**Aim:** This study aimed to determine the impact of different case definitions on prevalence estimates for periodontitis in two epidemiological data-sets.

**Material and Methods:** Data sets from the Omani study and the Dunedin Multidisciplinary Health and Development Study (DMHDS) at age 32 were used. Eight published case definitions utilising different levels of pocket depth (PD) and clinical attachment loss (CAL) were applied to the data sets. These were divided into definitions utilising PD and CAL of 3-4mm to identify periodontitis cases and those utilising PD and CAL of 6mm or more to identify severe periodontitis cases.

**Results:** Depending on the case definition used, there was a wide range in the prevalence estimates for periodontitis. With less severe case definitions, the frequency ranged from 48.9% to 98.7% in the Omani study. Less variation was observed with more stringent case definitions, where the frequency ranged from 7.9% to 9.2%. This variation was confirmed in the second data set (DMHDS), where the frequency ranged from 14.4% to 60.0% with the less severe case definitions, and from 2.1% to 49.9% with the more stringent case definitions. The use of index teeth produced the lowest frequency in both data sets (0.6% and 0.5% for Omani and DMHDS respectively).

**Conclusion:** Our findings underscore the fact that minor differences in the threshold values of periodontal pockets and clinical attachment loss and in the number of affected sites used in case definitions result in major variations in the prevalence estimates.

Topic: Clinical Research: Epidemiology and delivery of care

## P0696

### Association between low income and periodontal diseases in Brazilian Indians

S.S. Soares, M.C. Nascimento, H.M. Lopes, E.C. Carvalho, P.R. Cury

Salvador/Brazil

**Aim:** Periodontal diseases have been inversely related to education

and income in many populations. The aim of this study was to evaluate the association between periodontal diseases and socioeconomic position indicators in Brazilian Indians.

**Material and Methods:** The sample consisted of 226 Kiriri Indians (19-77 years) from 10 isolated Indian Areas of the Northeast of Brazil. Full-mouth clinical attachment level (CAL), plaque index (PI) and bleeding on probing (BoP) were evaluated by calibrated examiners. Periodontitis was characterized as 3 or more sites with  $\geq 4$  mm clinical attachment loss. The following interview data were collected: age, sex, smoking habits, diabetes, education and income.

**Results:** Multiple-regression analysis showed significant association between low income and periodontitis ( $p = 0.008$ ). Otherwise, education was not associated with clinical parameters of periodontal disease ( $p > 0.05$ ).

**Conclusion:** Lower income was associated with periodontitis in this population of Brazilian Indians.

Topic: Clinical Research: Epidemiology and delivery of care

**P0697**

### Correlation of PGU values and probing pocket depths in an Austrian teaching hospital

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Vienna/Austria

**Aim:** All patients at the Bernhard Gottlieb University Dental Clinic are screened for periodontal disease at first visit. The PGU (parodontale Grunduntersuchung) is used. Patients with PGU indices  $>3$  are referred for periodontal treatment and full mouth measurements are taken:

The aim was 1. to assess the prevalence of periodontal disease in patients seeking dental treatment and 2. to assess the correlation of PGU scores with the deepest probing pocket depth in the respective sextant in two WHO cohorts (35-44 and 65-74 yrs of age).

**Material and Methods:** Data from records of all patients 18-74yrs, seeking treatment at the BGZMK during 2008 and 2010 were extracted: chief complaint, age, gender, smoking status, number of teeth; and descriptive statistics performed.

In the two cohorts Cohens Kappa Coefficient was used to describe the correlation of PGU and pocket depth in the respective sextants for males/females, smokers/nonsmokers.

**Results:** 5.350 patients were eligible: 2.899 females and 2.451 males. Reported smoking status was 41 vs. 53%. Chief complaint was pain or periodontal problems (27 resp. 17%). In the younger cohort were 131, in the older 52 patients. Correlation between PGU scores and probing pocket depths values showed little to moderate correlation. Correlation was higher in frontal sextants, but only in the younger cohort. PGU score 2 and 3 values underestimated the parodontal situation, PGU score 4 values showed the highest correlation, but tended to overestimate the parodontal treatment necessity.

**Conclusion:** Prevalence of periodontal disease in this population is comparable with other European countries. PGU underestimates periodontal treatment necessity more than it overestimates it.

Topic: Clinical Research: Epidemiology and delivery of care

**P0698**

### Periodontitis is associated with increased systolic blood pressure elevation in Brazilian Indians

L. Ferraz, L.S.F. Ribeiro, P.R. Cury

Salvador/Brazil

**Aim:** Periodontitis has been associated with increases in blood pressure. This study aimed to assessed the association between hypertension and periodontitis.

**Material and Methods:** The sample consisted of 226 Indians (19-77 years). Full-mouth periodontal evaluation was performed and periodontitis was characterized as 3 or more sites with  $\geq 4$  mm clinical attachment loss. The blood pressure (BP) was evaluated before the buccal examination.

**Results:** Multiple-regression analysis showed that the probing depth, the mean loss of clinical attachment level and the number of sites showing  $CAL \geq 4$  mm were significantly correlated with increased systolic blood pressure ( $p \leq 0.05$ ), but not with diastolic blood pressure ( $p > 0.05$ ).

**Conclusion:** The results of this study provide evidence that periodontitis is associated with increased systolic blood pressure among Brazilian Indians.

Topic: Host microbial interactions

**P0700**

### Topical application of sonicated and heat-treated *Staphylococcus aureus* or *Aggregatibacter actinomycetemcomitans* into rat gingival sulcus induces periodontal tissue destruction after immunization

F. Nagano, Y. Yoshinaga, T. Kaneko, A. Kuramoto, S. Nakatsu, Y. Takamori, T. Kishimoto, S. Noguchi, Y. Hara

Nagasaki/Japan

**Aim:** Periodontitis is generally accepted that bacteria and host defense system influence its onset and progression. However, little is concretely known about their interaction on periodontal destruction. Recently we reported that immune complexes of LPS and its specific antigen forming in gingival sulcus induce periodontal destruction (Kuramoto, J Periodontal Research, in press). In this study, we used sonicated and heat-treated *Staphylococcus aureus* (S. a.) or *Aggregatibacter actinomycetemcomitans* (A. a.) after immunization and then histopathologically examined their influences on the periodontal tissue.

**Material and Methods:** Rats previously immunized with S. a. or A. a. were used as the immunized groups. The non-immune group received sterile PBS. Each sample was applied topically into the palatal gingival sulcus of first molars in both groups every 24 hours for 10 days. The first molar regions were resected and observed histopathologically. Blood samples were collected from the rats on 0 day, 5 days and 10 days in the experimental period and the serum level of anti-S. a. or A. a. antibodies were determined by ELISA.

**Results:** Significant attachment loss, increasing apical migration of



junctional epithelium and inflammatory reactions such as neutrophils's infiltration were observed in the immunized groups. The serum levels of anti-S. a. and -A. a. antibodies in the non-immunized groups showed no significant change.

**Conclusion:** S. a. and A. a. could induce attachment loss in immunized rat. The results suggest that not only Gram-negative but also Gram-positive bacteria involve in periodontal destruction under the existence of high serum level of their specific antibody.

Topic: Host microbial interactions

P0701

### Clinical and histological characteristics in Bisphosphonate- Related Osteonecrosis of the Jaws associated with Actinomyces: Comparison between patients on PO and IV Bisphosphonates

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<sup>1</sup>Jerusalem/Israel, <sup>2</sup>Petah-Tiqva/Israel

**Aim:** To compare clinical and histological findings of patients on PO versus IV Bisphosphonates with Bisphosphonate- Related Osteonecrosis of the Jaws (BRONJ) associated with Actinomyces, and to correlate the clinical course and treatment requirements with the finding of histomorphometric analysis.

**Material and Methods:** The study was a 10-year retrospective analysis of archived cases with BRONJ. Actinomyces colonies were identified using hematoxylin-eosin, Gram, and periodic acid-Schiff stains, exhibiting filamentous morphology with color variation between center and periphery. Only colonies with adjacent tissue reaction (inflammation, fibrosis) were analyzed. Actinomyces density (AD) was calculated by dividing the total number of colonies by tissue surface, Actinomyces relative surface (ARS) was calculated by dividing total bacterial colony surface by tissue surface.

**Results:** The study includes 53 patients (39 on IV and 14 on PO Bisphosphonates). The average AD was  $4.25 \pm 6.72$  in patients on IV Bisphosphonates and  $7.25 \pm 11.81$  in patients on PO Bisphosphonates, with no significant differences between groups. The average ARS was  $0.06 \pm 0.10$  in patients on IV Bisphosphonates and  $0.11 \pm 0.13$  on patients on PO Bisphosphonates, with no significant differences between groups. No significant differences were found in the duration of antibiotic treatment nor the duration of healing between groups.

**Conclusion:** Although Actinomyces was abundant in BRONJ in both IV and PO groups, there were no significant differences in duration of antibiotic treatment or the duration of healing, that could indicate that Actinomyces may have a detectable impact on disease duration or outcome.

Topic: Host microbial interactions

P0702

### Lactobacillus reuteri modulates the secretion of pro-inflammatory cytokines by human macrophage-like cell line U-937

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<sup>1</sup>Rio De Janeiro/Brazil, <sup>2</sup>Stockholm/Sweden

**Aim:** To assess the cytokine response patterns observed following stimulation of the *L. reuteri* with human macrophage-like cell line U-937.

**Material and Methods:** *L. reuteri* Prodentis obtained from a commercial lozenge: Periobalance (BioGaia AB, Sweden) and a potentially pathogenic bacterium *Escherichia coli* (*E. coli*) (strain EAEC I49) were used to stimulate the human macrophage-like cell line U-937. The experiment was performed in two steps. In the first step, each bacterium was used to stimulate U-937 cells separately. In the second step, U-937 cells were first stimulated with the probiotic *L. reuteri* and then stimulated with *E. coli*. Non stimulated U-937 cells represented the negative controls. Cytokine concentrations of IL-6, IL-8, IL-10, IFN $\gamma$  and TNF- $\alpha$  were measured from culture supernatants using a commercially available Lincplex kit.

**Results:** *E. coli* induced the production of higher quantities of cytokines, whereas both negative control and *L. reuteri* induced similar productions of IL-6, IL-8, IFN $\gamma$  and TNF- $\alpha$  by human macrophage-like U937. Pre-incubation of U937 cells with *L. reuteri* and subsequent incubation with *E. coli*, induced lower concentrations of cytokines, when compared to negative control.

**Conclusion:** *Lactobacillus reuteri* is a probiotic that downregulates the production of pro-inflammatory cytokines by human macrophage-like cell line U-937.

Topic: Host microbial interactions

P0703

### Heat shock protein 27 expression in oral lichen planus lesions from different oral epithelium and control mucosa

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<sup>1</sup>Madrid/Spain, <sup>2</sup>Geneve/Switzerland

**Aim:** Oral lichen planus (OLP) has been considered a chronic disease. There have been described precipitating factors such as dental plaque. There exists the possibility of a role for the Heat-shock proteins (HSPs) in the beginning or persistence of the lymphocytic response that takes place in the pathogenesis of this entity. The aim of this study is to highlight the not very known dynamic evolution of OLP and to analyze the expression of hsp27 in normal and lichen planus-affected oral mucosae and to compare the expression in the diverse stages of OLP lesions in respect to the healthy mucosa in order to evaluate the biological and/or prognostic role of hsp27 in OLP pathogenesis. The possible interactions between HSPs and periodontal disease described in the literature will be also presented.

**Material and Methods:** 36 cases of OLP and 10 cases of health patients were selected. hsp 27 expression was analysed by means of immunohistochemistry. Influence of sex, age and anatomical location was also studied.

**Results:** Hsp 27 expression varied between the different groups and there were statistically significant differences.

**Conclusion:** Altogether, the present data suggest that hsp27 may have any role in the pathway of OLP pathogenesis. In relation with the different stages of OLP, our study demonstrates that there seems to be differences between the three OLP groups.

## Topic: Host microbial interactions

## P0704

**Clinical, microbiological and immunological determinants in patients with different forms of periodontitis**

Y.G. Chumakova

Odessa/Ukraine

**Aim:** The aim of the present study was to identify clinical, radiographic, bacterial and immunological characteristics of chronic periodontitis (CP) and aggressive periodontitis (AP).

**Material and Methods:** Clinical and radiographic examination of 272 patients with severe CP (age 18-58 years) and 53 patients with AP (22 – juvenile periodontitis and 31 – rapidly progressive periodontitis of adults) (age 14-35 years) was conducted. Pocket probing depth and relative attachment level were measured with Florida probe and gingival bleeding index. Microbiological identification of periodontopathogens was carried out using established anaerobic culture techniques. Immunological examination included the study of cytokines regulation in blood and gingival fluid (IL-1 $\beta$ , IL-4, IL-6, IL-10, TNF $\alpha$  levels) and immunological analysis in blood (CD2, CD3, CD4, CD8, CD4/CD8, CD19, CD22, CD57 lymphocytes, IgA, IgG, LKT, C3-complement component), saliva and gingival fluid (SIgA, IgA, IgG, lysozyme, C3-complement component).

**Results:** Clinical-laboratory features of CP and AP and main pathogenic factors were determined. The role of local factors of an oral cavity, microflora a periodontal pocket, infringements in system of local immunity of an oral cavity and periodontal tissue, cytokine disbalance are investigated. Diagnostic and treatment planning protocol of different forms of periodontitis was developed. Efficiency of various methods of antimicrobial treatment, including systemic antibiotic therapy, was evaluated.

**Conclusion:** Long-term results of complex treatment (up to 10 years) of patients with chronic and aggressive periodontitis using non-surgical therapy, periodontal surgery, orthodontic and prosthetic methods will be shown.

## Topic: Host microbial interactions

## P0705

**Haplotype analysis of the IL-10 promoter polymorphisms and microbial composition in patients with chronic and aggressive periodontitis**

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Brno/Czech Republic

**Aim:** Interleukin-10 (IL-10) is a key regulatory cytokine that has a significant effect on both the innate and adaptive immune response. The aim of this study was to analyze polymorphisms in the IL-10 gene and their associations with microbial composition and clinical manifestation of chronic (CP) or aggressive (AgP) periodontitis.

**Material and Methods:** Three polymorphisms [-1082G/A (rs1800896), -819C/T (rs1800871) and -592C/A (rs1800872)] in

the IL-10 gene were studied in 256 patients with CP, 67 patients with AgP and 267 unrelated controls. All polymorphisms were detected using the PCR-RFLP methods. Subgingival bacterial colonization (occurrence of *A. actinomycetemcomitans*, *P. gingivalis*, *P. intermedia*, *T. forsythia*, *T. denticola*, *P. micros*, *F. nucleatum* in subgingival pockets) was investigated by the DNA-microarray based detection kit.

**Results:** Despite significant differences determined in the occurrence of periodontal bacteria between patients with CP/AgP and healthy controls (from  $p < 0.0001$  to  $p < 0.05$ ), no significant differences were determined in allele, genotype or haplotype frequencies of all polymorphisms between patients with CP or AgP and controls ( $p > 0.05$ ). However, *T. forsythia* occurred less frequently in non-periodontitis individuals positive for the A allele of IL-10-1087A/G variant ( $P < 0.05$ , OR=0.45, 95%CI:0.20-1.05). In contrast, IL-10-824T and IL-10-597A allele carriers had an increased odds ratio (OR) for the individual presence of *T. denticola* ( $P < 0.03$ , OR=2.40, 95%CI:1.05-5.45 and OR=2.53, 95%CI:1.08-5.95).

**Conclusion:** In conclusion, although our results indicate that IL-10 haplotypes are not associated with susceptibility to aggressive or chronic periodontitis in the Czech population, the IL-10 gene variants could be shown to be associated with subgingival bacterial colonization.

## Topic: Clinical Research: Periodontal systemic interactions

## P0706

**Subgingival Aggregatibacter actinomycetemcomitans associates with the risk of coronary artery disease**P. Mäntylä<sup>1</sup>, K. Buhlin<sup>1</sup>, S. Paju<sup>1</sup>, R.G. Persson<sup>2</sup>, M.S. Nieminen<sup>3</sup>, J. Sinisalo<sup>3</sup>, P.J. Pussinen<sup>1</sup><sup>1</sup>University Of Helsinki/Finland, <sup>2</sup>Bern/Switzerland, <sup>3</sup>Hus/Finland

**Aim:** The aim was to investigate the association between the angiographically verified coronary artery disease (CAD) and subgingival levels of *Aggregatibacter actinomycetemcomitans* (clone b), *Porphyromonas gingivalis*, *Tannerella forsythia*, and *Treponema denticola*.

**Material and Methods:** The dentate study population (n = 445) comprised of 172 (38.7%) patients with stable CAD, 157 (35.3%) with acute coronary syndrome (ACS) and 116 (26%) with no pathological findings in coronary angiography (ns CAD). All patients participated in clinical and radiographic oral examination. Subgingival bacterial samples were collected from the deepest periodontal sulcus of each dentate quadrant and analyzed as a pooled sample by checkerboard DNA-DNA hybridization assay.

**Results:** The prevalence of *A. actinomycetemcomitans* positive patients was significantly higher in stable CAD group (42.4%) than in ns CAD (30.2%) ( $p = 0.035$ ). In a logistic regression analysis adjusted with age, gender, hypertension, dyslipidemia, diabetes mellitus, smoking, body mass index, and bleeding on probing, *A. actinomycetemcomitans* positivity associated with stable CAD with OR 1.895 (95% CI 1.041-3.450,  $p = 0.037$ ). In all study groups, *P. gingivalis*, *T. forsythia* and *T. denticola* levels had a significant ( $p < 0.010$  for all) linear association with the level of alveolar attachment loss (AAL) categorized into none, mild, moderate, and severe-total. For *A. actinomycetemcomitans*, such trend was seen only in stable CAD ( $p = 0.071$ ).

**Conclusion:** Subgingival *A. actinomycetemcomitans* associates

with almost 2-fold risk of stable coronary artery disease. High P. gingivalis, T. forsythia and T. denticola levels associate with the increasing severity of AAL thus associating with periodontitis.

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**P0707**

### 8-OHdG Levels in Patients with Chronic Periodontitis and Hyperlipidaemia

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**Aim:** The aim of this study was to evaluate serum levels of 8-hydroxydeoxyguanosine (8-OHdG), is an oxidative stress parameter, in patients with chronic periodontitis and hyperlipidaemia.

**Material and Methods:** Thirty six hyperlipidaemic (HD) patients and 38 systemically healthy controls (C) were included in the study. Both groups were divided into two subgroups as healthy (h) and periodontitis (p). The clinical periodontal parameters including plaque index (PI), gingival index (GI), probing pocket depth (PPD), clinical attachment level (CAL) and percentage of bleeding on probing (BOP %) were recorded. Fasting venous blood samples were obtained to assess serum lipids and 8-OHdG levels.

**Results:** The HDp group had higher the ratio of total cholesterol (TC) to high density lipoprotein cholesterol (HDL) (TC/HDL) and triglyceride levels in comparison with the HDh group ( $p<0.01$ ). The HDp group showed a higher PPD, BOP% and CAL levels than the Cp group ( $p<0.01$ ). The serum level of 8-OHdG was significantly higher in the HDp group when compared with the Cp and Ch groups ( $p<0.01$ ). In the HDp group, BOP % was positively associated with serum TC, TC/HDL and 8-OHdG levels ( $p<0.01$ ).

**Conclusion:** Serum 8-OHdG levels may play a potential role in the association between hyperlipidaemia and periodontitis.

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**P0708**

### Serum and GCF Myeloperoxidase Levels in Periodontal Disease and Hyperlipidaemia

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**Aim:** Both periodontal disease and hyperlipidaemia are important public health problems in both developed and developing countries. The aim of this study was the evaluation of the serum and gingival crevicular fluid (GCF) myeloperoxidase (MPO) levels in interaction between periodontal disease and hyperlipidaemia.

**Material and Methods:** One hundred and twenty three subjects with hyperlipidaemia and 68 systemically healthy controls (C) were included in the study. Hyperlipidaemic groups were divided into two groups as suggested diet (D) and prescribed statin (S). Both groups were divided into three subgroups as healthy

(h), gingivitis (g) and periodontitis (p). The clinical periodontal parameters including plaque index, gingival index, probing pocket depth and percentage of bleeding on probing and fasting venous blood were obtained to determine serum MPO levels.

**Results:** In the Cp group, serum MPO levels were statistically significant higher than Cg and Ch groups ( $p<0.01$ ). There were significant increases in the Dp group than in the Dg and Dh groups ( $p<0.05$  and  $p<0.01$ , respectively). There were statistically significant correlations between clinical periodontal parameters and serum and GCF MPO levels in the C, D and S groups.

**Conclusion:** Serum MPO levels may be an important pathogenesis stage of the interaction between periodontal disease and hyperlipidaemia. Further longitudinal studies in larger populations with different periodontitis and hyperlipidaemia phases are needed to clarify this association.

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**P0709**

### Spontaneous gingival haemorrhage : clinical cases

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**Aim:** Gingival bleeding is perhaps the most common manifestation of the inflammatory process that presents daily at the dental clinic. Chronic marginal gingivitis accounts for most of this and is usually managed with simple periodontal therapy followed by oral hygiene instructions. Significant gingival bleeding that is of sudden onset and difficult to control, warrants further investigation.

**Material and Methods:** The aim of this work is to identify by clinical cases, the significance of bleeding disorders in the treatment of periodontal disease, and the management of periodontal patients with bleeding disorders.

**Results:** Data obtained from a carefully crafted history, physical examination will most often be satisfactory for forming a diagnosis. However laboratory tests are used when more information is required.

**Conclusion:** In addition to the diagnostic, laboratory tests are extremely important in assisting in the management of the patient during periodontal treatment.

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**P0710**

### The effects of Periodontal Treatment on Serum ox-LDL and anti-ox-LDL Levels In Hyperlipidaemic Patients with Periodontitis

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**Aim:** Recent reports draw attention to the association between periodontal disease and impaired lipid metabolism. The aim of this study is the evaluation of the effects of periodontal therapy on serum oxidized (ox-LDL) and anti-ox-LDL levels in hyperlipidaemic patients with periodontitis.

**Material and Methods:** Fifty two patients with hyperlipidaemia and periodontitis, and 28 systemically healthy controls with periodontitis (C) were included in the study. Hyperlipidaemic groups were divided into two groups as suggested diet (DP) and prescribed statin (SP). The clinical periodontal parameters including plaque index, gingival index, probing pocket depth and percentage of bleeding on probing, and fasting venous blood were obtained. Serum oxide-low density lipoprotein (ox-LDL), and serum antibody levels to ox-LDL (anti-ox-LDL) were evaluated at baseline, one week after periodontal treatment, and two months follow-up the completion of the non-surgical periodontal treatment (2MFU) that included scaling and rootplaning.

**Results:** Serum anti-ox-LDL levels showed statistically significant increase at the end of the periodontal treatment in the DP and SP groups compared to baseline ( $p < 0.05$ ).

**Conclusion:** Further longitudinal studies conducted in hyperlipidaemic patients with periodontitis will provide the determination of the new therapeutic approaches in this population.

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P0711

### Periodontal Treatment and Serum Lp-PLA2 and hsCRP Levels in Hyperlipidaemics.

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**Aim:** The aim of this study was to evaluate the effects of periodontal treatment on serum lipoprotein-associated phospholipase A2 (Lp-PLA2) and high sensitive C-reactive protein (hsCRP) levels in hyperlipidaemic patients with periodontitis.

**Material and Methods:** Fifty two patients with hyperlipidaemia and periodontitis, and 28 systemically healthy controls with periodontitis (C) were included in the study. Hyperlipidaemic groups were divided into two groups as suggested diet (HD) and prescribed statin (HS). Periodontal parameters including plaque index, gingival index, probing pocket depth, clinical attachment level, and percentage of bleeding on probing (BOP%) were recorded. Serum lipids, Lp-PLA2 and hsCRP levels were evaluated in venous blood. All serum parameters were assessed in each subject at baseline, one week after periodontal treatment (1WPT), and two months after the completion of non-surgical periodontal treatment (2MPT).

**Results:** At baseline, the HS group had a higher value of BOP% when compared to the C and HD groups. The increases in serum Lp-PLA2 levels at 2MPT were statistically significant compared to baseline and 1WPT in HS group. There were no significant differences among the study periods regarding serum hsCRP levels.

**Conclusion:** Serum Lp-PLA2 may be an important lipoprotein associated inflammatory mediator in hyperlipidaemic patients with periodontitis.

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P0712

### EVALUATION OF PERIODONTAL AND METABOLIC PARAMETERS IN TYPE 2 DIABETES MELLITUS PATIENTS

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**Aim:** To evaluate the relationship of periodontal parameters with metabolic levels, and to compare the periodontal parameters in well and poorly controlled type 2 diabetes mellitus (T2DM) patients.

**Material and Methods:** Twenty-seven T2DM patients were included in the study. A full-mouth periodontal examination, including plaque index (PI), gingival index (GI), probing depth (PD), bleeding on probing (BOP), clinical attachment level (CAL) were performed. Blood analyses were carried out for glycated hemoglobin (Hb1Ac), fasting plasma glucose, high-sensitivity C-reactive protein (hs-CRP), and lipid profiles. Diabetes control was determined by the percentage of HbA1c calculated as the mean value of last 4 records of the patients whom divided in to 2 categories: well controlled,  $\leq 7\%$ ; and poorly controlled,  $> 7\%$ .

**Results:** Out of 27 patients, diabetes was well controlled in 16 and poorly controlled in 11 patients. The mean PD, BOP% and CAL scores were significantly lower ( $P < 0.05$ ) whereas both the mean percentage of sites with  $PD < 4\text{mm}$  and with  $CAL < 4\text{mm}$  were significantly higher ( $P < 0.05$ ) in well controlled than poorly controlled T2DM patients. Moreover, the mean percentage of the sites with  $PD \geq 4\text{mm}$  was significantly higher in poorly controlled T2DM patients compared to the well controlled ( $P \leq 0.05$ ). No significant correlations were found between laboratory and periodontal parameters in both T2DM patient groups.

**Conclusion:** Within the limits of the study, this study confirmed that T2DM patients with poor glycemic control are at higher risk for periodontal disease than well controlled patients in terms of increased probing depths and gingival inflammation.

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P0713

### Thermographia – method of investigation for the gingivo-periodontal manifestation at leukaemia patients-case report

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Bucharest/Romania

**Aim:** To describe particularities of oral and gingivo-periodontal manifestations in leukaemia patients and the implementation within the investigational practice of the thermography method at the level of the marginal periodontium for these patients.

**Material and Methods:** Hospitalized patient in the Speciality Clinic of Fundeni Clinical Hospital – Haematology Department, with the diagnostic of acute myeloid leukaemia, supervising and performing the thermography method at the level of the marginal periodontium.



**Results:** The knowledge over the manifestations occurred at the marginal periodontium level is extremely important for the dentist and also for the haematology specialist. The thermography investigation has allowed the display of inflammatory and tumorous processes at the level of the marginal periodontium of patients included in the study.

**Conclusion:** Thermograph investigation is efficient in orientation of diagnosis, monitoring of treatment and phototherapeutic follow up of leukaemia patients.

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### P0714

#### Mononucleosis infection : statistical and clinical evaluation of gingivo-periodontal symptoms

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Iasi/Romania

**Aim:** This clinical and statistical evaluation study aimed total gingivo-periodontal manifestations due to infectious mononucleosis generally correlated with clinical, laboratory examination results and general demographic characteristics.

**Material and Methods:** We took a group study consisting of 95 people hospitalized with the diagnosis of infectious mononucleosis in which we evaluated the clinical aspects of muco-gingival lesions in correlation with oral lesions and the emergence stage of the infectious mononucleosis.

**Results:** Most cases 20.6% of the total study group showed at intraoral clinical examination hemorrhagic pickets, diffuse gingival erythema and a smaller percentage had gingivo-necrotic acute ulcerative stomatitis.

**Conclusion:** Acute human infection, transmission, usually benign, occurring more frequently in younger age (children and adolescents), infectious mononucleosis is characterized by clinical polymorphism, diagnostic difficulties, possible complications as well as the existence of possible relationships with other oral pathological entities (aggressive periodontitis) or systemic (Hodgkin disease), characters emphasizes the need for numerous clinical biological research on this disease.

## Topic: Clinical Research: Periodontal systemic interactions

### P0715

#### PERIODONTAL HEALT OF ELDERLY PERSONS WITH AND WITHOUT PARKINSON'S DISEASE. A CASE – CONTROL STUDY.

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**Aim:** Periodontal and Parkinson's disease both represent a global public health problem and affect significant portion of elderly population. The aim of our study was to compare the periodontal status of elderly patients with Parkinson's disease and periodontal status of patients with good systemic health.

**Material and Methods:** In this case - control study, we included 39 consecutive patients with Parkinson's disease ( $62 \pm 23$  years

old, 28 men) and 55 age matched systemically healthy patients (22 men). We evaluated the level of oral hygiene by dichotomous plaque index, DMFT index and standard periodontal parameters. The extent and activity of periodontal disease were evaluated by measuring periodontal wound size as originally described by Skaleric et al. (2012).

**Results:** Parkinson's disease patients had similar plaque index ( $68,8\% \pm 32,7\%$  vs.  $59,3\% \pm 19,2\%$ ), DMF index ( $27,9 \pm 7,2$  vs.  $21,1 \pm 5,8$ ), total subgingival area ( $11,5 \pm 5,5$  cm<sup>2</sup> vs.  $10,6 \pm 5,7$  cm<sup>2</sup>), total inflammatory burden ( $8,2 \pm 5,0$  cm<sup>2</sup> vs.  $7,4 \pm 4,5$  cm<sup>2</sup>) and significantly ( $p < 0,05$ ) larger probing depths ( $3,3 \pm 0,9$  mm vs.  $2,9 \pm 0,6$  mm), bleeding on probing ( $47,1 \pm 21,9\%$  vs.  $34,8 \pm 18,8\%$ ) and total bleeding wound ( $4,8 \pm 4,2$  cm<sup>2</sup> vs.  $2,3 \pm 3,0$  cm<sup>2</sup>) than systemically healthy persons, respectively.

**Conclusion:** Probing depths and the size of bleeding periodontal wound in patients with Parkinson's disease are greater than in persons without systemic diseases. Our results indicate that in patients with Parkinson's disease besides dental plaque, other factors might modulate the development of periodontitis.

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### P0716

#### The effect of periodontal treatment on the improvement of glomerular filtration rate in chronic kidney disease patients with chronic periodontitis

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**Aim:** The aim of this study was to evaluate the effect of periodontal treatment on the progression of renal dysfunction and metabolic markers (albumin, cholesterol and triglycerides) in patients with chronic kidney disease (CKD) and chronic periodontitis.

**Material and Methods:** Fifty seven patients with CKD at pre-dialysis phase and chronic periodontitis were evaluated 90 days, while 29 patients were evaluated 180 days after periodontal therapy. Periodontal clinical parameters included plaque index (PI), bleeding on probing (BOP), probing pocket depth (PPD) and probing attachment level (PAL). Glomerular filtration rate (GFR) and creatinine (mg/dl), triglycerides (mg/dl), total cholesterol (mg/dl) and albumin (g/dl) levels were evaluated at baseline and 90 and 180 days after periodontal therapy. GFR was evaluated with the Modification of Diet in Renal Disease (MDRD) equation.

**Results:** All periodontal clinical parameters significantly improved ( $p < 0.05$ ) ninety ( $n=57$ ) and 180 days ( $n=29$ ) after periodontal therapy. There was a significant improvement of the median values (interquartil range) of GFR from 36.2 (24) ml/min on baseline to 37.5 (24) ml/min on day 90, while the improvement of GFR values were from 36.2 (27.3) on baseline to 39.4 (27.9) ml/min ( $p < 0.05$ ) on day 180. No significant differences were observed of the median values of creatinine, albumin, total cholesterol and triglycerides comparing baseline, 90 and 180 days after periodontal treatment.

**Conclusion:** Periodontal clinical parameters and GFR improved significantly 90 and 180 days after periodontal treatment. Although the progression of the renal dysfunction may be related to many factors, periodontal treatment may be beneficial to the course of CKD.

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## P0717

## SALIVARY ENZYMES DURING PREGNANCY AND POST-PARTUM

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**Aim:** Salivary enzyme levels are increased during periodontal inflammation. However, their presence in pregnancy gingivitis is not well known. The current longitudinal study aims to define the differences in salivary enzyme levels among subjects with or without gingivitis during pregnancy and post-partum.

**Material and Methods:** Thirty generally healthy, non-smoking, pregnant women were examined once per each trimester (PrEx I-III), and twice during post-partum (PrEx IV-V). At each visit, visible plaque and bleeding on probing (BOP) were scored, and the levels of salivary elastase, matrix metalloproteinase (MMP)-8, myeloperoxidase (MPO), and tissue inhibitor metalloproteinase (TIMP)-1 were measured. Subjects were divided to the healthy and gingivitis subgroups according to their BOP < 20 % or ≥ 20% of the sites, respectively.

**Results:** In both subgroups, salivary MMP-8 and MPO levels decreased after the first trimester (PrEx I) and remained low and steady throughout pregnancy. After delivery (PrEx IV), however, those two enzyme levels increased significantly ( $p < 0.05$ ) reaching the highest peak during the follow-up period. Especially in the gingivitis group, visible plaque and salivary elastase levels had a similar trend in their appearance, being at the highest level during the first trimester. Since then, those levels decreased visit by visit, being at the lowest level during post-partum visits. Salivary TIMP-1 levels remained rather steady during pregnancy and post-partum in both groups.

**Conclusion:** Salivary MPO and MMP-8 were suppressed during pregnancy, while salivary elastase levels were stimulated by plaque. This may indicate that neutrophilic response during pregnancy is not totally, but selectively, suppressed.

## Topic: Clinical Research: Periodontal systemic interactions

## P0718

## Periodontal condition and the development of hypertension – results of a longitudinal study

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**Aim:** To investigate whether there is an association between periodontal condition and the development of hypertension in a longitudinal setting.

**Material and Methods:** The subjects were drawn from a population-based cohort of inhabitants of the city of Oulu, who were born in 1935. The subjects in this study belong to a diabetes study where the subjects ( $n=208$ ) underwent a clinical baseline examination in 1990–1992 and follow-ups in 1996–1998 and 2000. The subjects were categorised into four categories according to their periodontal condition in the baseline examination: subjects without deepened periodontal pockets, subjects with deepened periodontal pockets of

pocket depth of 4 mm or more, subjects with deepened periodontal pockets of pocket depth of 6 mm or more, and edentulous subjects. The criteria for diagnosed hypertension were systolic blood pressure ≥160 mmHg or diastolic blood pressure ≥95 mmHg or use of antihypertensive therapy. Confounding variables included gender, physical activity, smoking history, body mass index and diabetes. Odds ratios (OR) with 95% confidence intervals (95% CI) were estimated using logistic regression models.

**Results:** During the follow-up period, 38 out of 109 subjects developed hypertension. Being edentulous at the baseline associated with the development of hypertension (OR 3.9, 95% CI 1.2–14.5). There was no consistent association between the severity of periodontal infection at the baseline and the development of hypertension.

**Conclusion:** Edentulousness was found to predict the development of hypertension. Additional research is needed to determine the nature of this association.

## Topic: Clinical Research: Periodontal systemic interactions

## P0719

## Effects of melatonin on antioxidant enzymes in ligature-induced periodontitis in rats liver

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**Aim:** Purpose of this study was to evaluate the effect of melatonin on the activities of antioxidant enzymes in the liver tissue of ligature-induced periodontitis rats.

**Material and Methods:** In the study twenty eight Wistar Albino male rats were used. The rats were divided into four groups as follows: Healthy(S) saline solution(s), Smelatonin(m), Periodontitis(P) and Pm. 3/0 silk ligature were placed at the gingival margin of the upper second molars in both mandibular quadrants. Rats in Sm and Pm groups began to receive 10 mg/kg/day, i.p., melatonin for 2 weeks. Following 2-weeks, all rats were anaesthetized and then were sacrificed. Liver samples were collected in order to determine levels of malondialdehyde (MDA), Superoxide dismutase (SOD), glutathione peroxidase (GSH-Px).

**Results:** MDA levels were higher in P groups when compared with S groups. SOD and GSH-Px levels lower in Ps group compared to Pm group as well as MDA level lower in Pm group.

**Conclusion:** Melatonin might caused a decrease in MDA levels and an increase in SOD and GSH-Px levels and might regulate the activities of antioxidant enzymes of ligature-induced periodontitis in rat liver.

## Topic: Clinical Research: Periodontal systemic interactions

## P0720

## Halitosis in periodontal patients

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**Aim:** Halitosis is defined as an unpleasant odor that emanates

from the oral cavity. The etiological chain of halitosis relates to the presence of the volatile sulphur compounds VCS produced by bacteria. It is often connected with different aspects of periodontal disease, tongue coating. Halitosis is also strongly connected to the amount of the saliva which can also interfere with the quality of life. The aim of the study was to investigate the parameters of halitosis and hiposalivation- xerostomia in the periodontal patients in our clinic.

**Material and Methods:** 124 periodontal patients with different clinical aspects of periodontal involvement, pocket depth and gingival bleeding were examined during the periodontal treatment using a portable sulphide monitor (Halimeter; Interscan Co, USA). Systemic and dental histories were also obtained and unstimulated saliva flow was measured

**Results:** Amongst 124 periodontal patients 70 females and 54 males, 25 were diagnosed with gingivitis and 99 with periodontitis. All of the patients complained of halitosis, but 48- 38, 7% were found to have greater VCS levels measured by Halimeter. Xerostomia was diagnosed in 27-21, 7% patients 10 males and 17 females. Halitosis and xerostomia together were found in 20-16, 1% patients 6 males and 14 females. There was significant correlation between VCS levels and xerostomia in female periodontal patients.

**Conclusion:** Halitosis is associated with periodontal disease and can be connected to hiposalivation-xerostomia. Periodontal therapy combined with tongue cleaning is beneficial for oral pathogenic halitosis.

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### P0721

#### aggressive periodontitis: two siblings cases

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**Aim:** The aim of this work is to explain the familial aspect of aggressive periodontitis: possible causes, the clinical and radiological aspect of familial aggressive periodontitis, impact on the diagnosis and the therapeutic management

**Material and Methods:** Aggressive periodontitis are rapidly progressive forms of periodontitis, characterized by severe destruction of periodontal attachment apparatus at an early age.

The prevalence of aggressive periodontitis in morocco reaches high level. Through two clinical cases, we propose to compare clinical and radiographic profile of two sisters in two family. we will show the interest of aggressive periodontitis early diagnosis.

**Results:** The short time of manifestation of clinically detectable levels of disease is generally interpreted as being the expression of either aggressive etiological agents, that implies infection with a highly virulent microbiota, or a high level of subject susceptibility to periodontal disease, or a combination of the two (Tonetti & Mombelli 1997)

**Conclusion:** two etiological hypothesis of familial aggressive periodontitis:

genetic causes

bacterial contamination between the members of the same family

## Topic: Clinical Research: Periodontal systemic interactions

### P0722

#### aggressive periodontitis: two siblings cases

S. Mikou, M. Elfarouki, K. Amine, J. Kissa

Casablanca/Morocco

**Aim:** Aggressive periodontitis are rapidly progressive forms of periodontitis, characterized by severe destruction of periodontal attachment apparatus at an early age. the prevalence of aggressive periodontitis in morocco reaches high level. their familial nature suggest a genetic transmission factor or bacterial transmission between members of the same family ; Through two clinical cases, we propose to compare clinical and radiographic profile of two sisters in two family. we will show the interest of aggressive periodontitis early diagnosis

**Material and Methods:** studies who were interested to intrafamilial distribution of aggressive periodontitis have focused on two assumptions: genetic transmission bacterial transmission a report of the most relevant studies will be cited

**Results:** as a result: Aggressive periodontitis seems to be inherited in a Mendelian fashion, and both X-linked and autosomal modes of transmission have been proposed (Hart et al. 1992, Hodge et al. 1999). The short time of manifestation of clinically detectable levels of disease is generally interpreted as being the expression of either aggressive etiological agents, that implies infection with a highly virulent microbiota, or a high level of subject susceptibility to periodontal disease, or a combination of the two (Tonetti & Mombelli 1997)

**Conclusion:** Through this work we want to emphasize the attitude that must have the dentist when he receive young people with aggressive periodontitis in searching the notion of a familial disease

## Topic: Clinical Research: Periodontal systemic interactions

### P0723

#### Toll like receptor 2 and Treponema denticola are increased in placentas of patients with hypertensive disorders: a case control study

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**Aim:** Aim(s): To explore the expression of toll-like receptor-2 (TLR-2), toll-like receptor-4 (TLR-4) and the presence of periodontal pathogens in placentas of patients with hypertensive disorders.

**Material and Methods:** A case-control study was performed. At the time of delivery, were enrolled 25 cases of hypertensive disorders including pregnancy hypertensive syndrome and preeclampsia and 33 controls were randomly selected. Placental biopsy was obtained after aseptic placental collection. All samples were studied for P.gingivalis, F.nucleatum, T.denticola, P.intermedia and A.actinomyces comitans using quantitative polymerase chain reaction technique. Determination of TLR-2 and TLR-4 was performed in total protein purified samples isolated from placental tissues by ELISA assays. Data

was analyzed using descriptive statistics and the association between variables was estimated through logistic regression models.

**Results:** TLR-2 and TLR-4 were expressed both in normal and hypertensive placentas. However there was a significant association between hypertensive disorders and levels of TLR-2 ( $p=0.012$ ). Additionally, a significant increase in T.denticola was observed in placentas of women with hypertensive disorders ( $p=0.005$ ).

**Conclusion:** Conclusion(s): T.denticola or their products and TLR-2 are increased in placentas with hypertensive disorders and suggest that periodontal diseases is another infection that plays a role in the pathogenesis of hypertensive pathologies. However, more studies are required to determine the role of TLRs and periodontal pathogens in the relationship between periodontal disease and adverse pregnancy outcomes.

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**P0724**

### Expression of CD14, CD16 and CD45 on monocytes from aggressive periodontitis patients

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**Aim:** Aggressive periodontitis (AgP) shows particular clinical symptoms, characterized by rapid destruction of tooth-supporting tissues and leading to tooth loss in young people. In AgP patients, peripheral blood monocytes display a unique phenotype. Change in monocyte differentiation and activation may have a significant impact on pathogenesis and progression of AgP. The aim of this study was to examine the expression of CD 14, CD16 and CD45 on monocytes from AgP patients and healthy subjects.

**Material and Methods:** Peripheral blood was collected from 23 (12 male, 11 female) AgP patients and 19 (13 male, 6 female) healthy subjects. Probing pocket depth and bleeding on probing were examined in these subjects. Expression of CD14, CD16 and CD45 on monocytes was analyzed using flow cytometry.

**Results:** Flow cytometry analysis showed a significant decrease in the percentage of CD16+CD45+monocytes from AgP patients when compared with healthy control subjects. No significant difference was observed in the percentage of CD14+CD16+CD45+ monocytes between AgP patients and healthy control subjects.

**Conclusion:** There is significant difference in the expression of CD16 on monocytes from AgP patients and healthy subjects. These findings suggest that monocytes from AgP patients show specific phenotype and it may have an impact on pathogenesis and progression of AgP.

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**P0725**

### Correlations between panoramic radiograph indices and bone mineral density in women aged over 50

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Gwangju/Korea

**Aim:** We evaluated whether panoramic radiograph indices were useful in the diagnosis of bone mineral density.

**Material and Methods:** In this study, we recruited 3,888 subjects who were over fifties in Dong-gu in two different time periods: April 28 through July 18, 2008 and April 13 through June 26, 2009. We conducted the investigation with questionnaire, oral examination, panorama taking, and measuring bone mineral density. All the female over fifty who are at high risk for osteoporosis were selected among those recruits for this study. Finally, all the data for 223 individuals were included for the final study after excluding the subjects who had unclear view of mental foramina on the panoramic radiography and the cortical boundaries of the mandibles. BMD was measured by dual-energy X-ray absorptiometer. We made a comparison and analyzed statistically between panoramic radiograph indices and Z score.

**Results:** MI values of 2 or less group, MCI values of 3 group, SVE values of 3 groups had the highest correlation with lower bone mineral density group. Z score tended to decrease as getting older and showed a statistically significant negative correlation. MI, SVE values were the largest in 50's and the smallest in 80's. As getting older, the cortical width of mandible was decreasing. The correlation between age and MCI did not have a statistically significant difference.

**Conclusion:** From the results above, we know that panoramic radiograph indices and bone mineral density had a statistically significant correlation and determine that panoramic radiograph indices are helpful in diagnosing lower bone mineral density.

Topic: Clinical Research: Periodontal systemic interactions

**P0726**

### Periodontal aspects of patients with Marfan syndrome

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<sup>1</sup>Hannover/Germany, <sup>2</sup>Hamburg/Germany

**Aim:** Aim of this clinical study was to examine the periodontal conditions in patients with Marfan syndrome, which is a disease of the connective tissues with dominant autosomal inheritance caused by a mutation in the fibrillin gene.

**Material and Methods:** 51 patients with Marfan syndrome (30 female and 21 male, mean age: 40.2 years) and 31 healthy controls (17 females & 14 males, mean age: 40.3 years) were examined once including a dental examination, full-mouth x-rays and a periodontal examination including probing pocket depth (PPD), gingival recessions (GR), clinical attachment level (CAL), and bleeding on probing (BOP) determined with a calibrated periodontal probe. Statistical analysis was performed using the unpaired t-Test (SPSS 18.0).

**Results:** In the Marfan-group DMFT index was 14.5 versus 13.7 in the control-group, PPD was 2.33 mm in the Marfan-group and 2.39 in the control-group. CAL was 2.62 mm in the Marfan-group and 2.70 mm in the control-group, BOP was 21.58% in the Marfan-group and 17.53% in the control-group. The mean values were not significantly different.

**Conclusion:** A higher prevalence for periodontitis in patients with Marfan syndrome is frequently described by different authors. Mostly, the published articles are case reports and



described the gingival conditions without examining the CAL. Based on the 51 examined patients with Marfan syndrome in this study a higher prevalence of periodontitis can not be confirmed.

Topic: Clinical Research: Periodontal systemic interactions

**P0727**

### Periodontal health in patients with acute myocardial infarction

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<sup>1</sup>Huddinge/Sweden, <sup>2</sup>Stockholm/Sweden

**Aim:** The purpose of this pilot study, part of the large PAROKRANK (periodontal disease and the association with coronary heart disease) study, was to investigate if periodontal health differs between patients with acute myocardial infarction (AMI) and healthy population based controls.

**Material and Methods:** In all 121 individuals comprised the study population. The cases (n=66) were patients with a first AMI recruited from eight Swedish hospitals while age, gender and geographically matched healthy persons recruited from the population registry served as controls (n=55). A radiographic panoramic image from each subject was examined regarding the marginal bone level, the number of remaining teeth and the number of periapical lesions. All radiographic measurements were performed by a blinded investigator.

**Results:** The mean marginal bone level differed between the two groups: patients = 75.7% and controls = 79.5% of the total root length. The marginal bone level was significantly associated with AMI (p = 0.035). Logistic regression analysis showed a relation between marginal bone loss and AMI with an odds ratio (OR) of 2.66 (95% CI: 1.07-6.62). There was no statistically significant difference in the number of teeth and in the number of periapical lesions between the two groups.

**Conclusion:** This pilot investigation indicates that periodontal disease is associated with acute myocardial infarction. The results support the need for larger investigations providing possibilities to adjust for potential confounders.

Topic: Clinical Research: Periodontal systemic interactions

**P0728**

### Gingival Enlargement in an Adolescent With Juvenile Rheumatoid Arthritis - A Case Report

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Istanbul/Turkey

**Aim:** Rheumatoid arthritis(RA) is a systemic autoimmune disease encompassing breach of self-tolerance, chronic inflammation and joint destruction. The aim of this case report was to report the follow-up procedures of a teenager at 16 with gingival enlargement in anterior upper jaw with juvenile RA and juvenile osteoporosis.

**Material and Methods:** The patient was diagnosed with juvenile RA when he was 3 years old. He has been taking a panel of medications; Enbrel (Etanercept) (immunosuppressive), Fosomax (Alendronate) (bisphosphonate), Deltacortril (corticostreoid), Rocaltrol (Calcitriol) (corticostreoid) for 13 years, and Adalat (Nifedipine) (antihypertensive) previously. He had growth and developmental deformity as a common side effect of long term corticosteroid use. The patient was diagnosed with drug induced (immunosuppressant and  $\text{I}^2$ -blocker) gingival enlargement and localised periodontitis. Periodontal therapy was limited to scaling and oral hygiene instruction (OHI).

**Results:** After periodontal initial therapy, the plaque and gingival index scores were decreased to below 25% and good oral hygiene behaviour could be established. The gingiva shrank as a result of the resolution of inflammation, however the fibrotic component solely dependent on the drug therapy remained. No surgical treatment procedure is planning as he is under above mentioned drug therapy and in puberty.

**Conclusion:** The patient is under maintenance programme, and regular scaling and OHI will be performed. In systemically compromised adolescents like JRA, the periodontal therapy should be planned as conservatively as possible to prevent infection attacks.

Topic: Clinical Research: Periodontal systemic interactions

**P0729**

### The evaluation of the relationship between periodontal status and osteopenia after hysterectomy

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**Aim:** Changes in bone mineral density may be associated with changes in periodontal status including supporting alveolar bone. The purpose of this study was to evaluate two groups of women one, who underwent hysterectomy and the other who manifested perimenopausal symptoms with respect to the development of osteopenia and its relationship with periodontal status.

**Material and Methods:** A total of 51 women were included in this study; 29 women had an indication for bilateral oophorectomy and total hysterectomy (BO+H) and 22 showed perimenopausal symptoms who carried the possibility of total hysterectomy (control group). Clinical periodontal and alveolar bone height measurements were performed by using Williams probe and computed tomography (CT), respectively. All patients were also evaluated with respect to bone mineral density (BMD) assessed by DEXA scanning at baseline and 12 months.

**Results:** No statistically significant difference existed between BO+H and control group with respect to alveolar bone level. There were no difference between the groups in periodontal clinical parameters throughout the study period neither (p>0.05). However, a statistically significant positive relation between femur neck BMD and alveolar bone loss was found in the BO+H group (p<0.05).

**Conclusion:** This data may point out to the fact that loss of BMD may account for the alveolar bone loss in BO+H group.

## Topic: Clinical Research: Periodontal systemic interactions

## P0730

**Effects of melatonin on oxidative stress in ligature-induced periodontitis in rats heart.**M. Özdem<sup>1</sup>, F.Y. Kırzioğlu<sup>2</sup>, H.R. Yılmaz<sup>2</sup>, A. Yiğit<sup>2</sup><sup>1</sup>Bolu/Turkey, <sup>2</sup>Isparta/Turkey

**Aim:** Purpose of this study was evaluate the effects of melatonin on the oxidative stress in the heart tissue of ligature-induced periodontitis rats.

**Material and Methods:** In the study twenty eight Wistar Albino male rats were used. The rats were divided into four groups as follows: Healty(S) saline solution(s), Smelatonin(m), Periodontitis(P)s and Pm. 3/0 silk ligature were placed at the gingival margin of the upper second molars in both mandibular quadrants. Rats in Sm and Pm groups began to receive 10 mg/kg per day, i.p., melatonin for 2 weeks. At the end of 14 days, all rats were anaesthetized and then were sacrificed. Heart samples were collected in order to determine levels of malondialdehyde (MDA), Superoxide dismutase(SOD), glutathione peroxidase (GSH-Px)

**Results:** As compared to Ss, in rat heart tissues of Sm, decreased levels of MDA and increased of levels of SOD and GSH-Px. While levels of SOD similar in Ps and Pm groups, GSH-Px levels were higher and MDA levels were lower in Pm groups when compared with Ps groups.

**Conclusion:** Melatonin may play a role in protecting tissue damage that is due to oxidative stress in ligature-induced periodontitis in rat heart.

## Topic: Clinical Research: Periodontal systemic interactions

## P0731

**PERIODONTAL DISEASE AND MISCARRIAGE: What is the relationship?**

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Ancona/Italy

**Aim:** Based on the numerous existing scientific evidence on the relationship between periodontal disease and adverse outcomes of pregnancy, we conducted a retrospective case-control study to investigate about a possible relationship between periodontal disease in pregnant woman's and miscarriage.

**Material and Methods:** Case-control study was conducted among patients of the Obstetrics and Gynaecology of Ancona's Salesi Hospital between 2006-2010. 40 women with a history of recurrent miscarriage were compared with a control group of 44 women of the same age without case of miscarriage in their obstetric history. Women with systemic diseases such as diabetes, etc. were excluded. Data regarding age, general medical history, obstetric and dental history, periodontal disease familiarity and lifestyles such as smoking and alcohol, and PD,CAL,GI,PI, BOP were collected for statistical analysis.

**Results:** The group of cases tends to have a higher average probing depth and a higher average percentage of sites probing 4 mm or more compared with the control group, but both do not reach a statistically significant difference. All other variables are similar between periodontal groups with the exception of GI and BOP. In particular, the percentage of sites with bleeding on probing was higher in the group of cases than controls, resulting statistically significant.

**Conclusion:** From the statistical analysis of our study showed that the most important variable associated with periodontal abortion is bleeding on probing and gingival index. The BOP is a sign of periodontal inflammation and this association could be explained by the argument that periodontal inflammation results in an increase of inflammatory mediators in the blood.

## Topic: Clinical Research: Periodontal systemic interactions

## P0732

**Periodontal therapy improved lipoprotein-associated phospholipase A2 and serum lipid levels in chronic periodontitis subjects with hyperlipidemia -a pilot study**

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Beijing/China

**Aim:** Objectives: Lipoprotein-associated phospholipase A2 (Lp-PLA2) is one of serum inflammatory biomarkers and has been found to be an independent predictor of cardiovascular disease (CVD). Hyperlipidemia is a traditional risk factor for CVD. The purpose of present study was to observe the effect of non-surgical periodontal therapy on levels of Lp-PLA2 and lipid profile markers in chronic periodontitis (CP) subjects with hyperlipidemia.

**Material and Methods:** In the present study, 40 CP subjects with hyperlipidemia (mean age 56±10 years old, male 20, female 20) were enrolled. The clinical parameters were examined, the plasma concentrations of Lp-PLA2, plasma lipid profiles including total Cholesterol(TC), triglyceride (TG), high-density lipoprotein (HDL), low-density lipoprotein (LDL), and white blood cell (WBC) counts were determined at baseline and 3 months after non-surgical periodontal therapy.

**Results:** After non-surgical periodontal therapy, all clinical parameters improved significantly (P=0.000). levels of Lp-PLA2, TC, TG and WBC counts reduced significantly (LP-PLA2: 30.06±9.96 to 23.80±14.76 ng/ml, P=0.019; TC: 5.76±0.73 to 5.50±0.63 mmol/L, P=0.002; TG: 1.80±0.60 to 1.61±0.40 mmol/L, P=0.001; WBC counts: 6.05±1.02 to 5.57±0.62 10<sup>3</sup>/L; HDL level increased significantly (1.24±0.41 to 1.37±0.45 mmol/L, P=0.003); the reduction of Lp-PLA2 (Δ<sup>-3</sup>Lp-PLA2) was significantly correlated with the reduction of PPD (Δ<sup>-3</sup>PPD) (P=0.020).

**Conclusion:** The results indicate that non-surgical treatment could reduce the systemic Lp-PLA2 and WBC level and made improvements in lipid profiles, which might provide a possibility to reduce the risk of cardiovascular disease in some subjects with hyperlipidemia.

## Topic: Clinical Research: Periodontal systemic interactions

**P0733****Effects of Porphyromonas Gingivalis Lipids on Apoptosis of Primary Human Chondrocytes**

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**Aim:** The aim of the present study was to analyze the effect of P. gingivalis total lipid fraction (TL) and dihydroceramides (DHC) on human primary chondrocytes.

**Material and Methods:** Primary chondrocyte cultures were incubated with P. gingivalis TL fraction, phosphoglycerol (PG-DHC) or phosphoethanolamine (PE-DHC) DHC lipids. Cell morphology was determined by light-microscopy. Cell apoptosis was analyzed by Annexin-V, active caspases and 7AAD staining and examined by flow cytometry. Procaspase-3 activation was determined by Western blot analysis. Cell necrosis was evaluated by LDH release.

**Results:** Microscopic analysis showed altered cell morphology and cell shrinkage following infection with P. gingivalis TL and PG DHC lipids. Flow cytometry demonstrated an increase of Annexin-V positive and active caspase-positive chondrocytes after incubation with TL and the PG DHC fraction, but not in PE -treated (control lipid) or untreated control cells. Furthermore, Western blot analysis showed an early cleavage of procaspase-3 after one hour.

**Conclusion:** The present data demonstrate that P. gingivalis lipids promote apoptosis in primary human chondrocytes, and thereby may contribute to the pathogenetic understanding of the association between periodontal infection and rheumatoid arthritis.

## Topic: Clinical Research: Periodontal systemic interactions

**P0734****Immunohistochemical Properties of Gingival Mucosal Epithelium in Female Patients at the Presence of Hormonal Imbalance.**

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Moscow/Russian Federation

**Aim:** Hormonal imbalance can manifest as a pathogenic factor that changes the number of sex steroid receptors in gingival inflammation. The aim of our study is the quantitative evaluation of the hormone saturation and proliferative activity of gingival epithelium cells in case of chronic gingivitis and periodontitis at the presence of hormonal imbalance in females.

**Material and Methods:** 10 female patients aged 18-35 with menstrual disorder and hormonal imbalance were examined. Clinically manifestation rate of gingival inflammation was evaluated with HI, GI, PBI, RP. During surgical debridement of an oral cavity the gingival fragment was routinely histologically processed with hematoxylin and eosin staining and immunohistochemically studied. For detection of sex steroid receptors we

use one-stage method with demasking of an antigen on paraffin sections by diagnostic; proliferative activity (Ki67) of gingival epithelium cells was defined as an average number of labeled nuclei per 100 registered.

**Results:** histology data indicated the signs of chronic inflammation: edema and separation of connective tissue stromal fibers in lamina propria, histiolympocytic infiltration, vasculitis, hypertrophy and evidences for epithelium acanthosis. HI 36.3±18.8, GI 0.35±0.33, PBI 2.28±0.20, FTI 7.98±2.22%, pcg/ml. In gingival epithelium we detected a high level of androgen (62.0±9.6%) and (37.0±18.4%) receptor expressing cells; Ki67 (42.0±20.4%), that is considered to be an average level. E2 92.6±25.7pcg/ml, FSH 7.05±4.25 mMU/ml, PTH 78.51±23.5β-estrogen

**Conclusion:** increased level of sex steroid receptors in gingival epithelium takes place in chronic gingivitis at the presence of hormonal imbalance in women and directly correlates with proliferative activity index. It can explain the inflammation-induced changes in periodontal tissues.

## Topic: Clinical Research: Periodontal systemic interactions

**P0735****Dental condition in women with osteoporosis during treatment with bisphosphonates**

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Moscow/Russian Federation

**Aim:** Osteonecrosis of the jaw is one of the rare complications of osteoporosis treatment with bisphosphonates. It often proceeds after tooth extraction or other surgical procedures, e.g. implantation. Nowadays a lot of researchers believe that osteonecrosis develops in jaw bones because oral tissues and organs are more often subject to infection. Thus it is necessary to develop a protocol of dental treatment of female patients taking bisphosphonates

**Material and Methods:** 43 osteoporotic female patients, age range 57-81 y.o. (average 67.8±2.34). were split in two groups. Group 1 (12 patients) took IV bisphosphonates, group 2 (31 patients) took oral bisphosphonates To assess dental condition the following indexes were used: HI, PBI, GI, PD, CAL, tooth mobility. Results were processed with StatPlus software. Descriptive statistics methods (Student criterion) were used. Significance level was chosen to be  $\bar{N}\epsilon<0.05$ . Patients were treated, namely treatment of caries and its complications, extraction of teeth.

**Results:** Data evaluation showed statistically significant differences between the groups. In group 1 patients had fewer teeth 12,3±3,45 than in group 2 (21,75±2,02), greater tooth mobility 1,5±0,43 in comparison with that in group 2 (1,5±0,43,  $p<0,05$ ). Pocket Depth and Clinical Attachment Loss (1,9±0,25mm and 2,17±0,31mm accordingly) were higher in group 1 than in group 2 (1,6±0,32 and 1,8±0,41mm accordingly,  $p<0,05$ ).

**Conclusion:** Osteoporotic patients taking IV bisphosphonates have more severe damage of periodontal tissues, more extracted teeth. No cases of bisphosphonate related osteonecrosis were detected in our study.

## Topic: Clinical Research: Periodontal systemic interactions

**P0736****Assesment of periodontal condition of patients with haematological malignancies**

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Ankara/Turkey

**Aim:** The purpose of this case report was to monitor the periodontal status of the patients with hematologic malignancy and to evaluate the possible associations between periodontal clinical indices and serum C-reactive protein(CRP), erythrocyte sedimentation rate(ESR), haemoglobin(Hb), neutrophil, lymphocyte, white blood cell and platelet counts.

**Material and Methods:** Fifty-five bone marrow cell transplantation patients with haematological malignancies (24 with lymphoma, 18 with multiple myeloma and 13 with leukemia), who newly referred to Department of Hematology, School of Medicine, Gazi University, were enrolled in this study. The periodontal assessment of patients was based following periodontal indices; plaque index(PI), gingival index(GI), bleeding on probing (BOP), probing depth (PD) and attachment loss (CAL) at around each tooth. CRP, ESR, Hb, Neu, Lymphocyte, WBC and PLT counts were determined in blood samples.

**Results:** No statistically significant relationship was detected between patients for periodontal clinical indices, serum CRP, ESR, Hb, Neu, Lymphocyte and WBC counts ( $p > 0.05$ ). PLT levels of leukemia patients were found statistically lower than lymphoma patients. There was a statistically significant correlation between CAL and Hb levels ( $r = 0.351$  and  $p = 0.017$ ).

**Conclusion:** We didn't detect any significant relationship between serum biomarkers and clinical periodontal indices of patients with haematological malignancies before BMCST. Further studies are needed to investigate the possible relationship between hematological malignancies and periodontal diseases.

## Topic: Clinical Research: Periodontal systemic interactions

**P0738****Serum inflammatory markers in periodontal disease and systemic inflammation**

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Iasi/Romania

**Aim:** Severe periodontitis is associated with the increase of serum inflammatory markers, in a population without general diseases. The aim of the study was to determine the manner in which the response to periodontal therapy had been associated with changes in the systemic serum markers of the inflammation.

**Material and Methods:** The study was performed on a group of 50 generally-healthy patients, yet suffering from generalized severe periodontitis, who participated to a prospective investigation developed along 12 months. The periodontal parameters and the inflammatory markers [C-reactive Protein (CRP) and Interleukin-6 (IL-6)] had been previously evaluated at 6 and 12 months, and also 6 months after the standard periodontal non-surgical treatment.

**Results:** 6 months after the treatment, a significant reduction of serum interleukine and C-reactive protein was observed in the subjects with a clinical response over the average to the periodontal therapy, following correction of the local causal factors.

**Conclusion:** The periodontal disease may be manifested as a systemic inflammatory charge, evidenced by modification of the inflammatory markers in the affected subjects.

## Topic: Clinical Research: Periodontal systemic interactions

**P0739****Biochemical and clinical research on antioxidants levels evolution in periodontal etiopathogeny**

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Iasi/Romania

**Aim:** A comprehensive and recent analysis concluded that oxidative stress is the main determinant of periodontal tissue breakdown resulting from systemic microbial interaction.

The aim study is to investigate the correlation between periodontal health and different antioxidants serum levels.

**Material and Methods:** A representative group of 58 patients, aged between 30 and 70 years were examined and treated between 2010-2011. Peripheral blood have been taken from patients and then retinol,  $\alpha$ -tocopherol,  $\gamma$ -tocopherol,  $\alpha$ -carotene,  $\beta$ -carotene,  $\beta$ -cryptoxanthin, zeaxanthin, lutein and lycopene were extracted from serum and measured using the liquid chromatographic technique.

**Results:** Levels of  $\alpha$  carotene and zeaxanthin were significantly low in patients with minimal onset periodontitis ( $p < 0.001$ ). These carotenoids values were also low in patients with onset periodontitis with  $\beta$ -carotene and  $\beta$ -cryptoxanthin were the only antioxidants associated with increased risk of severe periodontitis.

**Conclusion:** The study allows us to conclude the fact that low levels of a number of carotenoids, particularly  $\beta$ -carotene and  $\beta$ -cryptoxanthin are directly proportional to one of developing periodontitis with high prevalence.

## Topic: Clinical Research: Periodontal systemic interactions

**P0740****Five year follow up after surgical treatment of two ONJ patients**

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**Aim:** Bisphosphonates (BP), are widely used for the treatment of osteoporosis and bone metastasis of malignancies. Osteonecrosis of the jaws (ONJ) related to BP use have been reported and generally conservative treatment is recommended

**Material and Methods:** Patient A : 68 year-old male patient with multiple myeloma taking Zoledronic acid and Clodronic



acid, presented asymptomatic osteonecrosis both in the mandible and maxilla. Patient B: 79 year-old female receiving breast cancer treatment had been using Zoledronic acid, presented with ONJ in the mandible. Both patients were treated surgically. ONJ lesions were removed using chisels and burs. Primary wound closure was obtained. Delayed healing of soft tissues were observed in the mandible lesions in both patients. Maxillary lesions healed uneventfully. Patient A presented with a ONJ lesion in the maxilla at a new site that healed uneventfully after surgical removal. No recurring ONJ lesion was observed for the following 5 years Patient B, presented with a recurring lesion in the same location which later healed uneventfully after the second surgery. Alveolar inferior nerve was affected by the ONJ lesion extending to ramus of the mandible which caused paraesthesia. No bone exposure was observed during the following 5 years. However, affected nerve caused severe spontaneous pain.

**Results:** Conservative approach is generally recommended for ONJ cases. However, successful surgical treatments have also been reported for the selected cases.

**Conclusion:** Surgical treatment may also be applied cautiously for the treatment of ONJ as the defect size and extension allows a surgical approach and soft tissues are adequate for securing primary closure.

Topic: Clinical Research: Periodontal systemic interactions

## P0741

### Effects of melatonin on oxidative stress in ligature-induced periodontitis in rats kidney.

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<sup>1</sup>Bolu/Turkey, <sup>2</sup>Isparta/Turkey

**Aim:** The role of melatonin on possible oxidative damage in the kidney tissue of ligature-induced periodontitis rats.

**Material and Methods:** Twenty eight male rats were divided into four groups as follows: Healthy(S) saline solution(s), Smelatonin(m), Periodontitis(P)s and Pm. 3/0 silk ligature were placed at the gingival margin of the upper second molars in both mandibular quadrants. Rats in Sm and Pm groups began to receive 10 mg/kg per day, i.p., melatonin for 2 weeks. At the end of 2-week, all rats were anaesthetized and then were sacrificed. Kidney samples were collected in order to determine levels of malondialdehyde (MDA), superoxide dismutase(SOD), glutathione peroxidase (GSH-Px).

**Results:** In the Ss and Ps groups, while tissue MDA levels increased, SOD and GSH-Px activities reduced. Melatonin treatment reversed these effects as well.

**Conclusion:** These results show that melatonin may exhibit a protective effect on oxidative stress in ligature-induced periodontitis in rats kidney.

Topic: Clinical Research: Periodontal systemic interactions

## P0742

### Periodontal involvement in a patient with "En Coup De Sabre"

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**Aim:** Scleroderma "en coup de sabre" described by Addison in 1854 as a form of linear scleroderma. It presents on the frontal or frontoparietal scalp and forms a deep furrow that is said to resemble the "stroke of a sword".

**Material and Methods:** We report a 17-year-old female who diagnosed as scleroderma 'en coup de sabre' 5 months ago. The lesion was involving the frontal scalp, forehead, nose, mid-upper lip, midline of maxillary gingiva with a linear band of atrophy and hypopigmentation. She was treating with intralesional corticosteroids, and did not receive any convincing results. Involved area in maxillary gingiva was overlapping with frenum with no attached gingiva. She applied to our clinic for the treatment of gingival recession in her maxillary central incisor. Hypopigmented area of the gingiva was mostly on the right side of her midline and gingival recession was seen with an aberrant frenum. Since she was newly diagnosed and the spreading of the lesions could not control yet, the periodontal treatment was postponed.

**Results:** We described an intra-oral involvement of a patient with "en coup de sabre" which is extremely rare in dental literature.

**Conclusion:** "En coup de sabre" is a rare, sporadic disease with unknown etiology and remains difficult to treat. The unique appearance of these patients can lead to many negative psychological implications.

Topic: Clinical Research: Periodontal systemic interactions

## P0743

### Periodontal Status and CD4 lymphocyte counts of HIV positive patients in Lagos, Nigeria

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Lagos/Nigeria

**Aim:** To determine the association between CD4 lymphocyte count and periodontal status in HIV positive patients.

**Material and Methods:** This was a cross sectional study in which consecutive HIV positive patients (HAART naive) were seen at the HIV clinic of the Lagos University Teaching Hospital. The Community Periodontal Index of Treatment Need (CPITN) and Simplified Oral Hygiene Index (OHI) were the periodontal indices used to assess periodontal status. The values of their CD4 count were retrieved from medical records. Exclusion criteria included pregnancy, diabetes and smoking. Chi square test was used to determine associations.  $P < 0.05$  was considered significant.

**Results:** A total of 110 HIV positive patients were seen. 69.1% were women. Mean age was  $35.4 \pm 10.2$  years (range 19-72 years). Mean CD4 count was  $250.52 \pm 189.6$  cells/mm<sup>3</sup> (range 10-851 cells/mm<sup>3</sup>). Patients with CD4 count  $< 200$  were 46.4%, 200-499 were 41.8%, while  $> 500$  were 11.8%. Most (99.1%) had periodontal disease. Shallow pockets were the most common (55.5%), followed by calculus (33.6%). Oral hygiene was fair in 52.7%, good in 30.9%, and poor in 16.4% of the patients. There was no statistically significant association between CD4 count and periodontal disease ( $p = 0.723$ ) and oral hygiene status ( $p = 0.576$ ).

**Conclusion:** The periodontal status of HIV positive patients in this study was not influenced by their CD4 counts. Other factors apart from low CD4 lymphocyte counts may be associated with periodontal diseases in HIV positive patients.

## Topic: Clinical Research: Periodontal systemic interactions

## P0744

**The Diabetes and Periodontal Therapy Trial (DPTT)**

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**Aim:** Evidence suggests that periodontitis adversely affects glycemic control in patients with diabetes. The DPTT's purpose is to determine if non-surgical periodontal treatment reduces hemoglobin A1c (HbA1c) in subjects with type 2 diabetes and moderate or advanced periodontitis.

**Material and Methods:** DPTT is an ongoing, phase-III, multi-center, randomized trial with planned enrollment of 600 men and women with type 2 diabetes and concurrent chronic periodontitis. Enrollment began in November 2009 and will continue thru May 2012. Participants are recruited from five sites in North America. Periodontal clinical parameters and HbA1c values are determined at baseline, 3 months and 6 months. Treatment consists of scaling and root planing under local anesthetic for a minimum of two 90-minute sessions, plus chlorhexidine rinse (BID). Control participants receive the same treatment after 6 months (delayed therapy). The primary outcome is change in HbA1c values (%HbA1c) at 6 months. Secondary outcomes are changes in periodontal clinical measures (gingival index, bleeding on probing, pocket depths, and clinical attachment levels) and the Homeostasis Model Assessment (HOMA2).

**Results:** Through November 2011, over 1,400 potential subjects were screened, and 414 subjects randomized. Mean (SD) baseline hemoglobin A1c values to date are 7.8% (0.6). Fewer than 10% of subjects enrolled have been lost to follow up.

**Conclusion:** The increasing diabetes burden necessitates exploring new therapies and ways to manage this disease. The DPTT is an ongoing clinical trial in which dental and medical researchers have successfully collaborated to recruit subjects with both medical and dental entry criteria to address an important public health issue.

## Topic: Clinical Research: Periodontal systemic interactions

## P0745

**Systemic C-Reactive Protein level and GCF IL-1 profiles in periodontitis and periodontally healthy subjects.**

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**Aim:** Parodontitis is a local inflammatory process mediating destruction of periodontal tissues triggered by bacterial insult. Elevated CRP levels in periodontal patients have been reported by several groups. Levels of IL-1beta in GCF are dependent upon a genetic influence, the clinical and periodontal parameters.

We examined whether CRP plasma levels are in relation to levels of IL-1 in GCF evaluated from patients with varying degrees of periodontal disease.

**Material and Methods:** Serum CRP (by radial immunodiffusion assay) and FCG-IL-1beta (by ELISA) levels were assessed in 72 subjects, 24 with moderate mean clinical attachment loss (AL) (2.45±0.32 mm) and 24 with high AL (4.27±0.68 mm) as compared to 24 periodontally healthy controls (AL, 1.79±0.24).

**Results:** At baseline CRP plasma levels were correlated with IL-1beta levels at baseline for each group. Statistical significant increases in CRP levels and in IL-1beta levels were observed in subjects with periodontal disease when compared to healthy control. Subjects with high levels of mean clinical attachment loss had significantly higher mean CRP and IL-1beta levels (3.95±5.17 mg/l & 109.8±96.6) than control (1.82±2.01 mg/l & 38.6±45.3).

**Conclusion:** These data suggest that the levels of crevicular IL-1beta and plasma CRP are closely associated with periodontal status. At baseline the extent of increase in CRP and IL-1beta levels in periodontal groups depends on the severity of the disease after adjusting for age, smoking, etc. These data suggest that this markers expression is in part a host trait (probably related also to the activity of the periodontal host-response), and not strictly a function of clinical parameters.

## Topic: Clinical Research: Periodontal systemic interactions

## P0746

**Local amyloidosis of oral mucosa in patients with heart failure and metabolic syndrome**

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**Aim:** to characterize dental status and oral mucosa blood flow in patients with chronic heart failure and local amyloid deposits in the oral mucosa.

**Material and Methods:** Oral mucosa biopsies were taken from patients aged 32-74 years with heart failure I-IV NYHA functional class for differential diagnosis of systemic amyloidosis. The samples were investigated by histological and immunohistochemical methods (kappa and lambda antibodies, SAP, A-amyloid, prealbumin, P-amyloid). Dental investigation included assessment of hygiene and periodontal indices, panoramic X-ray, investigation of oral mucosa microvessels by an ultrasound Doppler device.

**Results:** Congo-positive deposits with a birefringence effect in the polar light were found in oral mucosa of 73.6% patients with heart failure. Systemic amyloidosis was confirmed in 15.3% of cases. The additional examination denied systemic amyloidosis in 58.3% of patients with heart failure. Amyloid deposits in oral mucosa were associated with severe periodontitis in 45.0% of cases. In 63.5% of cases they were found in patients with heart failure caused by the metabolic syndrome. Patients with local amyloidosis of oral mucosa had greater dysfunction of oral mucosa blood vessels. Local amyloidosis of oral mucosa was also diagnosed in a patient 17 years old without heart failure and periodontal pathology.

**Conclusion:** Local amyloidosis of oral mucosa is common, course without significant clinical signs and can be diagnosed

in young patients without heart failure. The risk of local amyloid deposition increases in patients with heart failure, metabolic syndrome and related periodontitis. Patients with heart failure have severe dysfunction of oral mucosa microvessels that is more apparent in patients with local amyloidosis of oral mucosa.

Topic: Clinical Research: Periodontal systemic interactions

**P0747**

### Drug Induced Hyposalivation May Be a Risk Factor To Periodontal Disease

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**Aim:** study the correlation between the periodontal status, before and after non-surgical treatment, and the use of drugs, which are known to induce hyposalivation.

**Material and Methods:** This retrospective study was conducted in which data from the files of periodontal patients who were treated in our department. demographic data, periodontal status and medications served the statistical analysis. A grade of amount of hyposalivation, in a scale of 0-4, as found in drymouth. Info internet site, was given to each patient, based on the drugs he or she were consuming.

**Results:** This study included 98 patients of which 30% reported of using at least one medication. although we found a significant correlation between the patients' plaque and bleeding scores we could only show a significant correlation between the patients' bleeding scores and the expected hyposalivation. we found a significant correlation between the patients' mean probing depths and the use of drugs inducing hyposalivation. we also found that patients using drugs with a hyposalivation value of 4 had a higher percentage of moderate and deep periodontal pockets as compared to patients with lower drug induced hyposalivation values. no correlation could be found between the results of the bacterial examination and the drug induced hyposalivation values. the amount of drugs taken by the patients had no effect on the results. none of these correlations was found after non surgical periodontal treatment.

**Conclusion:** In our study we found a significant correlation between the consumption of drugs inducing hyposalivation and the patients' periodontal status (FMBS and PD)

Topic: Clinical Research: Periodontal systemic interactions

**P0748**

### Periodontal involvement in a patient with 'En Coup De Sabre'

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**Aim:** Scleroderma 'en coup de sabre' described by Addison in 1854 as a form of linear scleroderma. It presents on the frontal or frontoparietal scalp and forms a deep furrow that is said to resemble the 'stroke of a sword'.

**Material and Methods:** We report a 17-year-old female who diagnosed as scleroderma 'en coup de sabre' 5 months ago.

The lesion was involving the frontal scalp, forehead, nose, mid-upper lip and midline of maxillary gingival region with a linear band of atrophy and hypopigmentation. She was treated with intralesional corticosteroids, and did not receive any convincing results. Involved area in maxillary gingiva was overlapping with frenum with no attached gingiva. She applied to our clinic for the treatment of gingival recession in her maxillary central incisor. Hypopigmented area of the gingiva was mostly on the right side of her midline and gingival recession was seen with an aberrant frenum. Since she was newly diagnosed and the spreading of the lesions could not be controlled yet, the periodontal treatment was postponed.

**Results:** We described an intra-oral involvement of a patient with "en coup de sabre" which is extremely rare in dental literature.

**Conclusion:** "En coup de sabre" is a rare, sporadic disease with unknown etiology and remains difficult to treat. The unique appearance of these patients can lead to many negative psychological implications.

Topic: Clinical Research: Periodontal systemic interactions

**P0749**

### Association between periodontal disease and body mass index in Brazilian Indians

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**Aim:** Obesity is increasing in prevalence and is a major contributor to worldwide morbidity. One consequence of obesity might be an increased risk for periodontal disease, although periodontal inflammation might, in turn, exacerbate the metabolic syndrome, of which obesity is one component. This study aimed to evaluate the association between obesity and periodontal disease in Brazilian Indians.

**Material and Methods:** The sample consisted of 226 Indians (19-77 years), living in 10 different Indian areas. Full-mouth periodontal evaluation was performed and periodontitis was characterized as 3 or more sites with  $\geq 4$  mm clinical attachment loss. Body weight was measured using body mass index (BMI), categorized into three categories:  $<25.0$  (normal weight),  $25.0-29.9$  (overweight) and  $30.0$  or more (obesity).

**Results:** Subjects with periodontitis showed higher BMI compared to non-periodontitis subjects ( $p = 0.05$ ) after adjustment for related confounders. BMI and obesity were not associated with plaque index, bleeding on probing or probing depth.

**Conclusion:** The results of this study provide evidence that higher BMI was associated with periodontitis among Brazilian Indians.

Topic: Clinical Research: Periodontal systemic interactions

**P0750**

### Periodontal infection and serum lipid levels

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**Aim:** To investigate the association between periodontal infection and serum lipid levels in a low socioeconomic population.

**Material and Methods:** A convenience sample of 506 individuals, with a mean age of 42.47 (SD 11.89) years, attending a publically funded dental clinic in a low socioeconomic area in Queensland, Australia, were recruited. Probing depths (PD) were measured at six sites/tooth and the levels of periodontal pathogens (*Porphyromonas gingivalis*, *Aggregatibacter actinomycetemcomitans*, *Fusobacterium nucleatum* and *Tannerella forsythia*) in pooled subgingival plaque samples were determined by real-time PCR. Serum levels of triglycerides (TG), high-density lipoprotein (HDL)-cholesterol and low density lipoprotein (LDL)-cholesterol were measured.

**Results:** Across all subjects and those <45 years there was no relationship between periodontal infection and levels of serum lipids. In subjects with less than two sites with PD  $\geq$  4mm levels of *P. gingivalis* were negatively correlated with levels of HDL ( $p=0.01$ ). In those with at least two sites with PD  $\geq$  4mm and those older than 45 years, the total bacterial load, together with levels of *A. actinomycetemcomitans* were negatively correlated with HDL levels (all  $p$ -values <0.05). In those with BMI <25 the total bacterial load was negatively correlated with HDL, while in those with BMI  $\geq$  25 the total bacterial load was negatively correlated with levels of LDL and TG.

**Conclusion:** The results of the present study suggest that in this low-socioeconomic population periodontal infection was negatively correlated with HDL levels, and with LDL and triglyceride levels in those with higher BMI, however the mechanism remains to be determined.

Topic: Clinical Research: Periodontal systemic interactions

## P0751

### Septic arthritis resulting from a periodontal infection.

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**Aim:** We present the case of a patient with septic arthritis in the left knee who presented with arthritis of the hip 35 years ago and was treated without any consequences. Later on he then went to the dental office complaining of general bleeding in the gum as a result of periodontal inflammation. The following day his left knee was inflamed and he went to the Emergency Service.

**Material and Methods:** With a diagnosis of suspected arthritis an arthrocentesis was performed extracting a sample of 85 cc of synovial fluid for subsequent studies. Antibiotic treatment consisted of clindamycin and cephalexin administered parenterally with excellent results. Bacteriological cultures of the synovial fluid revealed the presence of *Prevotella intermedia*.

**Results:** The initial location of the hematogenic dissemination was found to be in the periodontal pockets. Contrary to other published results the patient had no manipulation of the oral cavity previously.

**Conclusion:** Consequently, it is recommended that patients with previous articular pathology receive antibiotic treatment prior to surgical procedures and to delay these treatments as little as possible.

Topic: Clinical Research: Periodontal systemic interactions

## P0752

### Hypertension & Periodontitis. The Effect of Phase I Periodontal Treatment on IL-6 and CRP Levels

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**Aim:** Purpose of this clinical study was to investigate the connection between essential hypertension(HP) and chronic periodontitis in terms of C-reactive protein (CRP) and IL-6 levels in the gingival crevicular fluid (GCF) and saliva.

**Material and Methods:** 20 randomly selected systemically healthy subjects and 22 with essential hypertension subjects participated in the study and were assigned to 4 groups; Healthy subjects with chronic periodontitis (CP) (n=10), healthy subjects without chronic periodontitis (control) (n=10), hypertension patients with chronic periodontitis (CP + HP) (n=9) and hypertension patients without chronic periodontitis (HP) (n=13). All patients with chronic periodontitis received phase I periodontal therapy. GCF and saliva samples were obtained baseline and four weeks after treatment. The levels of IL-6 and CRP were measured using a sandwich ELISA kit and data were analysed statistically.

**Results:** At the baseline, salivary CRP levels in CP+HP group were significantly higher than control group ( $p<0.05$ ). Significantly higher GCF IL-6 and CRP levels were detected in CP+HP group when compared to HP and control groups ( $p<0.01$ ). CP group exhibited higher GCF IL-6 and CRP levels when compared to HP and control groups ( $p<0.05$ ). Treatment effect was statistically significant for PI, GI, PD, CAL and BOP values. Treatment, group and interaction effects were not significant for CRP and IL-6 in GCF and saliva.

**Conclusion:** Higher IL-6 and CRP levels were not associated with hypertension but chronic periodontitis.

Topic: Clinical Research: Periodontal systemic interactions

## P0753

### Prevalence of gingival enlargement induced by calcium channel blockers in Nigerians

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**Aim:** To determine the prevalence of gingival enlargement(GE) among Nigerian patients taking calcium channel blockers

**Material and Methods:** A prospective study in which consecutive patients placed on calcium channel blockers were seen at the Cardiology clinic of the Lagos University Teaching Hospital. Demographic data, duration of hypertension, type of calcium channel blockers prescribed and dosage were recorded. An oral examination including presence of GE (categorised into 1/3, 2/3 and > 2/3), Oral Hygiene Index (OHI) and Gingival Index (GI) were all noted on an interviewer administered questionnaire. Data was analysed using Epi Info 2007 version 3.43.

**Results:** A total of 71 patients were seen. 56.9% were female. Mean age was 55.6% $\pm$ 12.8 years. GE occurred more in females than males and was induced mainly by nifedipine and amlodipine. Majority (52.8%) were on amlodipine. The prevalence of GE was 28% among patients on calcium channel blockers. About 30% of the subjects had mild gingival enlargement which was the predominant state of GE seen (ie within 1/3



of the clinical crown-Grade I GE). Only 10% of GE was >1/3 clinical crown. About 40 (56.3%) presented with mild gingivitis in relation to GE while only 4.2% presented with severe inflammation. Prevalence of GE was not significantly affected by gender and age.

**Conclusion:** Drug induced, mild GE may occur in Nigerian patients on calcium channel blockers in our environment. Physicians should refer such patients to the dentist for advice on plaque control to ameliorate the size of GE or prevent its occurrence

Topic: Clinical Research: Periodontal systemic interactions

## P0754

### Association of periodontal disease with the stability of carotid atherosclerotic plaques as indicated by ultrasound.

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**Aim:** Periodontal disease has been associated with an increased risk for stroke. "Soft" atherosclerotic plaques of the carotids are more prone to rupture and produce emboli that result in stroke or transient ischemic episodes. The aim of this pilot study was to investigate whether periodontal disease is associated with a) symptomatic atherosclerotic plaques (TIA or non-disabling stroke in the previous 6 months) and b) the instability of atherosclerotic plaques as indicated by ultrasound.

**Material and Methods:** The study consisted of 53 patients that underwent surgery for carotid artery stenosis at the "Red Cross" Hospital in Athens. Prior to surgery symptomatic plaques were recorded and patients were examined with ultrasound for plaque stability as described by Gray-Weale et al. 1988. Additionally, patients received full mouth periodontal examination including measurements of attachment loss (AL) and probing pocket depth (PPD). Statistical analysis was performed using the X2 test.

**Results:** Seventeen patients were edentulous. Patients with mean PPD > 3.5 mm had more symptomatic plaques compared to patients with mean PPD < 2.5 mm ( $p=0.06$ ). There was also a trend for "softer" (type I and II) plaques for the first group ( $p=0.1$ ). A similar trend was, also, obvious when periodontitis was defined as patients with 4 sites with PPD  $\geq 6$  mm and AL  $\geq 5$  mm. Finally, edentulous patients had significantly more symptomatic plaques than patients with mean PPD < 2.5 mm ( $p=0.05$ ).

**Conclusion:** The results of this pilot study indicate that patients with more severe periodontitis may be associated with symptomatic and "softer" atherosclerotic plaques. However, a larger sample size is required to verify this association.

Topic: Clinical Research: Periodontal systemic interactions

## P0755

### Association between periodontitis and osteoporosis and possible therapeutical approaches in periodontology- a literature review.

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**Aim:** In this review the association between osteoporosis and periodontitis is discussed. Many research groups have considered a possible relationship between systemic loss of bone density and periodontal disease. The goal of this review is to find evidence-based answers to frequently asked questions concerning osteoporosis and periodontitis. Furthermore, possible new treatment approaches, deriving from osteoporosis therapy, for periodontal disease will be discussed.

**Material and Methods:** A broad search strategy of the literature using both Pubmed search engine and the Cochrane library was taken for this review. The search words "osteoporosis", "periodontitis", "therapy", "calcium" and "vitamin D" were used. Inclusion criteria limited the amount of results by only considering clinical trials and reviews.

**Results:** Whether osteoporosis affects the severity of periodontal disease remains controversial. Various studies indicate that osteoporosis or low systemic bone mineral density can be a risk factor for periodontal disease progression and increased alveolar bone loss. Other studies could not find any significant correlation. Vitamin D and calcium might positively influence periodontal health. Estrogen replacement therapy resulted in significantly less mean clinical attachment loss (CAL) in comparison to osteoporotic patients not taking estrogen. Bisphosphonates and teriparatide, which can be used in the treatment of osteoporosis, may have a positive adjunctive effect on periodontal therapy.

**Conclusion:** The association between osteoporosis and periodontitis needs to be evaluated in further prospective clinical studies with large sample sizes. New medical adjunctive treatment approaches should be also evaluated in clinical research to prevent and treat periodontal diseases.

Topic: Clinical Research: Periodontal systemic interactions

## P0756

### Severe congenital neutropenia- 5 years of observation

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**Aim:** Introduction. Severe congenital neutropenia (SCN) also known as Kostmann syndrome is a rare disorder with onset occurring very early in life. Neutrophils provide the first line of host defense against bacterial invasion of the mucous membranes and skin, therefore chronic neutropenia is generally associated with increased prevalence and severity of infections.

**Material and Methods:** Case report. A 3,5 year female patient was referred to our Department for evaluation of the condition of her oral cavity. Medical and dental records revealed that she had suffered from numerous severe recurrent bacterial infections since first month of her life. Oral problems has included stomatitis. At the age of 15 months, congenital neutropenia was diagnosed. She received rhG-CSF- human granulocyte colony stimulating factor and this therapy was repeated twice in combination with antibiotic and immunoglobulin. An orthopantomogram showed marginal bone loss in the primary teeth. Regular monthly appointments including non-surgical treatment resulted in decreased gingival inflammation. About one year later, the patient presented severe periodontitis and extensive bone loss. During the period of deciduous teeth replacement, a decrease of disease symptoms within the periodontium was observed. However, rather frequent infections took place usually accompanied by painful stomatitis aphthosa.

**Results:** Currently, a slightly accelerated eruption of permanent teeth is being observed. Incisors and molars demonstrate recession, significantly elongated clinical crowns and increased tooth mobility. Deepened periodontal pockets are present. Recurrent gingivitis resemble desquamative gingivitis.

**Conclusion:** This case confirms that non transplant SCN patients suffer from periodontal diseases and that the periodontitis is not fully normalized by G-CSF-treatment and normal neutrophil counts.

Topic: Periodontal clinical trials

## P0758

### Impact of periodontal treatment on oral health-related quality of life in patients with periodontitis in Japan

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**Aim:** To assess the potential impact of periodontal treatment on oral health-related QoL of patients with periodontitis in Japan.

**Material and Methods:** Participants were recruited from moderate to severe periodontitis patients. After initial periodontal therapy, they received open flap debridement. Oral Health-related Quality of Life Model for Dental Hygiene (OHRQL) was used to assess participant's QoL at each time point of periodontal evaluation.

**Results:** A total of 31 patients completed OHRQL assessment after periodontal surgery. Compared with baseline, a progressive improvement in all periodontal parameters was observed during the periodontal therapy. The OHRQL score at baseline was significantly reduced (improved) after initial therapy and after surgery ( $P < 0.01$ ). However, no significant difference was found between the OHRQL score after initial therapy and that after surgery. Large effect size (ES) was seen for the change from baseline to post-initial therapy and or post-surgery. In contrast, low ES was noted for the change from post-initial therapy to post-surgery.

**Conclusion:** Our findings suggest that during the course of periodontal treatment, initial periodontal therapy plays a major role in improving patient's oral health-related QoL.

Topic: Periodontal clinical trials

## P0759

### Mobile communication technology for the assessment of postoperative pain after periodontal surgery

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**Aim:** Reliability of self documented pain assessments in outpatients may need to be interpreted with caution. The aim of this study was to develop a more reliable approach using the mobile communication technology.

**Material and Methods:** 11 periodontitis patients (aged 36 to 81 years, 7M/4F) were included. Flap surgery was performed as individually required. Post surgery, patients were given a cellular phone equipped with an especially designed short message system (SMS) application for assessments on a visual analogue scale (VAS). After technical instruction, patients were asked to validate postoperative pain hourly on the day of the surgery, twice daily on the following two days and once daily for the rest of the week. VAS values, respective time points and dates were recorded.

**Results:** The response rate was 88% (median; quartiles 57 to 93%). Patients kept to the schedule by a deviation of 7 min (median; quartiles -39 to 57 min) which was negatively correlated to the response rate ( $r = -0.9$ ;  $p < 0.01$ ). The VAS values given during the hours directly post surgery (median 28; quartiles 10 to 46) were significantly ( $p < 0.05$ ) higher than those given on the following two days (median 8; quartiles 0 to 12) and the rest of the week (median 4; quartiles 0 to 9). Scatter plot of all VAS values over time showed that a peak was reached three hours post surgery.

**Conclusion:** The results of this study indicate that mobile communication technology can reliably be used in outpatients for the assessment of postoperative pain over time.

Topic: Periodontal clinical trials

## P0761

### Outcome of orthodontic treatment simultaneous to or after periodontal cause related treatment.

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**Aim:** To evaluate if there is any difference in periodontal status (clinical attachment level/marginal bone level) between two groups after the periodontal and orthodontic treatment is completed. Second objectives are treatment time, patient satisfaction, incidence of root resorptions and gingival recessions after treatment.

**Material and Methods:** 50 patients with uncontrolled marginal periodontitis selected for orthodontic treatment. Following randomised allocation, 25 patients will have periodontal treatment completed before orthodontic treatment and in another group of 25 patients periodontal treatment performed while orthodontic treatment proceeds. Cause related periodontal treatment performed around all teeth showing increased probing pocket depth (PPD) and bleeding on probing (BoP). Periodontal surgery is indicated after re-evaluation at sites still showing BoP and/or PPD > 6mm. The orthodontic treatment will be performed with full fixed straight-wire self-ligated appliances. Microimplants used for anchorage.

**Results:** The presentation will show the study design and early results from the first 15 treated patients.

**Conclusion:** Orthodontic movement of teeth with reduced periodontium may positively alter surrounding tissues, reduce root recession, stabilize mobile teeth and even alter bone contour.

Topic: Periodontal clinical trials

## P0762

### Dental Laser Safety: A Proposal for Improving Patient Safety in Bosnia and Herzegovina

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**Aim:** Patient safety in dentistry became an imperative of quality health care. Since lasers are progressively used in field of periodontology and implant dentistry, laser safety issues became of great importance for patient safety. Lasers are considered effective but potentially hazardous to the patients, due to their improper use and lack of laser safety awareness. In order to avoid potential hazards and ensure patient safety, dental practitioners should be properly trained in laser safety and should follow laser safety standards and regulations available. Since Bosnia and Herzegovina (B&H) has no such standards and lasers are increasingly used in everyday practice, the aim of this study is to propose a plan for patient safety in laser dentistry in B&H.

**Material and Methods:** The proposal is basically a modification of the fundamental seven-step plan, which covers the main objectives in patient safety. Also, available internationally accepted laser safety documents, such as the latest version of the American National Standards Institute standard for the safe use of lasers (ANSI Z136.1) and its European (EN) and international (IEC) equivalents are consulted.

**Results:** The proposal offers clinics a framework on which to operate towards improving laser patient safety, such as practical advices and techniques, examples of best practices and toolkits for the management. It also considers actions of different stakeholders.

**Conclusion:** Patient safety should be in focus in B&H laser dentistry. It is expected that implementation of proposal will ensure and improve patient safety in B&H laser dentistry in numerous aspects. Collaboration of all stakeholders, however, is essential.

Topic: Periodontal clinical trials

## P0763

### Clinical Evaluation of four type of sutures

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**Aim:** The primary objective of dental suturing is to position and secure surgical flaps to promote optimal healing and control bleeding. Ideally, such material should be biocompatible, retain adequate strength during healing, and induce minimal tissue reactions. A wide variety of suture materials are used, including organic and inorganic origin, resorbable and non-resorbable sutures. Due to differences in composition and mechanical properties, tissue reactions may vary among sutures. The aim of this randomized clinical trial is to evaluate clinical properties of four types of sutures. Erythema, edema, and unknotting were assessed in the area treated at 1week after resective surgeries

**Material and Methods:** This study was a prospective, double blind, randomized clinical trial. The sample was 20 patients. The inclusion criteria were patients with chronic periodontitis who required resective surgeries and a minimum of 4 suture knots. The sutures used were: silk 5-0 ; polypropylene 5-0; Polyglactin(PGA) 5-0; polytetrafluoroethylen (PTFE) 4-0. The sutures were removed after 1 week and the erythema, edema and the presence, absence or unknotting of the sutures were recorded. The statistical analysis was performed using the Chi Square test. P-values < 0,05 were considered statistically significant.

**Results:** There were no statistical differences between the different suture materials in respect to erythema, edema and unknotted sutures. Polypropylene was the suture that showed less erythema, edema, and it was present most of the times.

**Conclusion:** There were not differences between different suture materials at a clinical level after resective surgeries 1 week postsurgically. The sample size has been augmented to 20 surgeries and it will be presented.

Topic: Periodontal clinical trials

## P0764

### Quality of reporting in abstracts of studies in periodontology and dental implantology should be improved

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Heidelberg/Germany

**Aim:** A research abstract should be as informative as possible to allow readers, reviewers and editors to decide whether or not to assess the full text of an article. The standard of reporting in abstracts of studies in periodontology and dental implantology has not yet been assessed. Objectives: (1) To assess the quality of reporting in abstracts of randomized clinical trials (RCTs) published in periodontal and dental implantology fields. (2) To investigate changes in the quality of reporting by comparing samples from different periods.

**Material and Methods:** We searched the PubMed electronic database, independently and in duplicate, for abstracts of RCTs published in seven leading journals of periodontology and dental implantology from 2005 to 2007 and from 2009 to 2011. We assessed, independently and in duplicate, the quality of reporting in selected abstracts with reference to the CONSORT for Abstracts checklist. Cohen's Kappa statistic was used to determine the extent of agreement of the reviewer.

**Results:** Three-hundred and ninety-two abstracts were included in the review. Three items (intervention, objective, and conclusions) were almost fully reported in both samples. In contrast, other items (randomization, trial registration, and funding) were never reported. Most topics were similarly poorly reported in both samples of abstracts.

**Conclusion:** There is room for the improvement of the quality of reporting in abstracts of RCTs in periodontology and dental implantology. Authors should follow the CONSORT for Abstracts guidelines and journal editors should promote clear rules to improve authors' adherence to these guidelines.

## Topic: Periodontal clinical trials

**P0765****Clinical Attachment Loss after Non-Surgical Periodontal Treatment with Curettes And Nd:YAG Laser**

A. Dilsiz, V. Canakci

Erzurum/Turkey

**Aim:** Periodontal therapies aimed at altering the progression of periodontal diseases must include meticulous mechanical debridement during both the non-surgical and the surgical phases of periodontal treatment. The aim of this study was to evaluate and compare the immediate effect of trauma from instrumentation on clinical attachment level after non-surgical periodontal treatment with curettes and Nd:YAG laser.

**Material and Methods:** Sixteen patients with untreated chronic periodontitis, presenting probing depths of 4-6mm on anterior teeth, upper and lower, were entered into the study. The selected teeth were probed with a pressure-controlled probe, guided by stents. Each quadrant was randomly allocated in a split-mouth design either to treatment with Nd:YAG laser using an energy of 1W, 100mj, 1064nm (test group), or to periodontal treatment using Gracey curettes (control group). Clinical parameters, including plaque index (PI), bleeding on probing (BOP), probing pocket depth (PPD), probing attachment level (PAL) were acquired prior to and immediately after treatment.

**Results:** Statistical analysis demonstrated no differences between groups at baseline for all parameters ( $P>0.05$ ). At the immediately after treatment, the control group showed a greater attachment loss than the test group ( $P<0.05$ ). For control group, there were statistically significant differences between PAL immediately before and after treatment ( $P<0.05$ ), but not for test group ( $P>0.05$ ).

**Conclusion:** Within the limits of the present study, it may be concluded that non-surgical periodontal treatment with curettes causes a mean immediate attachment loss of 0.72mm, and that Nd:YAG laser seem to reduce significantly the trauma from of instrumentation produced.

## Topic: Periodontal clinical trials

**P0767****Gingival biotype and morphometric data related to maxillary central incisors in a university student population.**

M. Assaf, S. Alshalakh, T. Alaraj, F. Aliwiwe, S. Qawasmeh

Jerusalem/Palestine

**Aim:** To evaluate the distribution of gingival biotype based on transparency of the periodontal probe among a Palestinian population and correlation with morphometric data related to maxillary central incisors and surrounding soft tissues.

**Material and Methods:** Among the senior dental students at Al-Quds University, Palestine; forty-four volunteers with

healthy periodontium and absence of any restorations or history of orthodontic treatment were evaluated. Clinical parameters related to both maxillary central incisors included: Crown width/crown length ratio (CW/CL), gingival width (GW), probing depth (PD), and gingival thickness (GT). A periodontal probe was inserted in the midbuccal sulcus of the incisor to visually evaluate if it had a thin or thick gingival biotype.

**Results:** The study involved 32 females and 12 males; all their ages ranged between 22 and 24 years. Although clinical parameters of CW/CL, GW, and PD were all smaller in females (0.76, 5.75 mm, and 1.47 mm, respectively); none of them were significantly different from males (0.80, 5.9 mm, and 1.64 mm, respectively). Three clusters were determined: cluster A (eight females, four males) for clear thin-scalloped gingiva, cluster B (fifteen females, four males) for cases where it was unclear to be neither thin-scalloped nor thick-flat, and cluster C (nine females, four males) for clear thick-flat gingiva. Clinical parameters of CW/CL, GW, and PD were all statistically significantly different between clusters A and B.

**Conclusion:** Nearly one-third of the examined population had clear thin-scalloped gingiva with similar portion for thick-flat gingiva. Positive correlation is present between thick-flat gingival and greater clinical parameters of CW/CL, GW, and PD.

## Topic: Periodontal clinical trials

**P0768****Gingival crevicular fluid and plasma acute phase cytokine levels in different periodontal diseases**S. Becerik<sup>1</sup>, V. Öztürk<sup>1</sup>, H. Atmca<sup>2</sup>, G. Atilla<sup>1</sup>, G. Emingil<sup>1</sup><sup>1</sup>Izmir/Turkey, <sup>2</sup>Manisa/Turkey

**Aim:** The aim of the present study was to investigate gingival crevicular fluid (GCF) and plasma acute phase cytokines; interleukin-1 $\beta$  (IL-1 $\beta$ ), interleukin-6 (IL-6), interleukin-11 (IL-11), oncostatin M (OSM) and leukemia inhibitory factor (LIF) levels in patients with different periodontal diseases.

**Material and Methods:** Twenty chronic periodontitis (CP), 20 generalized aggressive periodontitis (G-AgP), 20 gingivitis (G) and 20 healthy (H) subjects were included. Probing depth, clinical attachment level, plaque index and papilla bleeding index was recorded. Plasma and GCF IL-1 $\beta$ , IL-6, IL-11, OSM and LIF levels were analyzed by ELISA.

**Results:** CP and G-AgP groups had significantly higher GCF IL-1 $\beta$ , IL-6 and IL-11 levels when compared to H group ( $p<0.05$ ). On the other hand, GCF LIF levels of CP and G-AgP groups were lower than those of the H group ( $p<0.05$ ). GCF OSM levels did not differ significantly among the study groups. Plasma levels of all the cytokines studied were not significantly different between the study groups.

**Conclusion:** Based on the present data, elevated GCF IL-1 $\beta$ , IL-6 and IL-11 levels suggested as reliable inflammatory biomarkers in periodontal diseases but not the plasma levels. Decreased LIF levels in diseased groups might reflect the possible beneficial effects of LIF in the modulation of inflammatory response in gingiva.



Topic: Periodontal clinical trials

## P0769

### Association between the incidence of periodontal-endodontic lesions and acute myocardial infarction

I. Willershausen, M. Peter, C. Weichert, B. Willershausen, A. Kasaj

Mainz/Germany

**Aim:** Hypertension, obesity, dyslipidemia, diabetes, smoking as well as genetic dispositions are risk factors, which are currently associated with an elevated risk of developing a myocardial infarction. The present study aims to establish a correlation between dental focal infections such as periodontal-endodontic lesions and myocardial infarction.

**Material and Methods:** A total of 248 patients after acute myocardial infarction (AMI) with a mean age of 62.1 years participated in this study (80.8% male; 19.2% female). As controls 249 age matched healthy individuals (mean age: 63.5 years) were recruited (71.8% male, 28.2% female). The dental examination included DMFT values, probing pocket depth, clinical attachment level, bleeding on probing, plaque index, as well as radiographs for the evaluation of possible apical lesions (LEO, LPO). The medical parameters included BMI, smoking habits (pack years) serum levels of CRP, LDL cholesterol and number of leukocytes.

**Results:** In general, the AMI patients displayed an unfavourable state of dental health. They had a higher caries frequency DMFT (AMI 20.1 versus controls 18.4) more missing teeth (8.7 versus 3.4), a higher number of apical lesions (1.3 versus 0.8), however fewer root canal fillings (1.6 versus 2.1).

**Conclusion:** This study was able to prove that patients after myocardial infarction have an unfavourable state of dental health. Therefore the early treatment of dental infections seems to be reasonable in order to reduce a further risk factor for the AMI patient collective.

Topic: Periodontal clinical trials

## P0770

### The Impact of Periodontal Disease on Quality of Life

N. Balci<sup>1</sup>, C.A. Grgan<sup>2</sup>, N. Alkan<sup>1</sup>, H. Uslu Toygar<sup>3</sup>

<sup>1</sup>Ankara/Turkey, <sup>2</sup>Kayseri/Turkey, <sup>3</sup>Istanbul/Turkey

**Aim:** The main aim is to evaluate the impact of periodontal disease on quality of life by using OHIP14 TR. The private aim is to evaluate reliability, validity, repeatability and intelligibility of the first Turkish (TR) translation of OHIP-14.

**Material and Methods:** This study have 3 part; pilot, main and the revision of the OHIP14 TR. Three experienced periodontist translated OHIP-14 English version into Turkish. An translator translated the translations back to English. Among the translations that were the closest to the original translations, the OHIP14 TR was constituted. The study material was comprised of 1045 patients, older than 25, applied to AUFD. OHIP14 TR was answered by the patients and a questionnaire assessing demographic data and periodontal records were collected. From the obtained data, reliability, validity, intelligibility and repeatability of OHIP14 (TR) were statistically evaluated.

**Results:** 331 women and 261 men with a mean age of 41.3±13.4 participated into main study. The mean probing depth and mean percentage of bleeding on probing were, 2.41±0.73 and 20.9±21.2, respectively. The repeatability of OHIP14 TR was found as repeatable (r=0.962), compared to original version it was valid, reliable (Cronbach Alpha=0.76) and intelligible (%97,7) and correlated with probing depth (r=0.320)

**Conclusion:** Reliability, validity, repeatability and intelligibility of the OHIP14 TR were proved. It was concluded that OHIP14 TR values increase with increasing values of probing depth and bleeding on probing percentages. Moreover, the questions were found as consistent among themselves.

Topic: Periodontal clinical trials

## P0771

### Correlations of radiological and clinical exam for fixed prosthetic restorations

A. Macris, S. Milicescu

Bucharest/Romania

**Aim:** The purpose of the study consist in establishing if results obtained by radiological exam of cervical margin of fixed prosthetic restoration could be compared with clinical exam of the same area.

**Material and Methods:** Three crowns (one metal-ceramic and two all metal) were used. Twenty-four radiographies were made: 3 radiographs for each 30 microns evaluation step (0 = ideal, 30-210 micron). Composite resin were used for abutment reconstructions. A standard method was used for obtaining radiographs. Clinical exams: each crown were positioned on demonstration model (Frasaco); the evaluations (40 doctors) were made on pre-establish positions marked on each crown.

**Results:** The result can be correlated on every value of radiological and clinical evaluation, except the value of 60 microns which appear to be clinically acceptable, but not radiological.

**Conclusion:** Radiography evaluation is always more sensitive than clinical exam; the value of 60 microns today can be consider unacceptable for marginal cervical area of a crown.

Topic: Periodontal clinical trials

## P0772

### Non-surgical Periodontal Teratment of a Patient With Hyperoxaluria and Oxalosis

D. Kutsal, B.F. Oduncuoglu, E.E. Alaaddinoglu, S. Unal, D. Ergin, T. olak, . Bulut, B. Hamzaebi

Ankara/Turkey

**Aim:** Introduction: Hyperoxaluria is a rare condition characterized by excessive production of urinary oxalate. The excess oxalate in combination with calcium deposits and damages various tissues including periodontium.

**Material and Methods:** The periodontal condition of a 25-year-old patient with a diagnosis of hyperoxaluria and end-stage renal disease and liver failure is presented. The periodontal examination

included the measurement and recording of clinical probing depths and clinical attachment loss in six sites of each tooth plaque index, gingival index and tooth mobility. Treatment plan included nonsurgical therapy for localized aggressive periodontitis. Tissue samples were obtained during non surgical therapy.

**Results:** In pathologic examination the histologic findings were consistent with calcium oxalate crystal deposition and oxalosis. The patient periodontal status were monitored for 6 months. Despite an initial decrease of soft tissue inflammation, the patient's periodontal condition deteriorated.

**Conclusion:** Hyperoxaluria can be associated with localized or generalized severe periodontitis and should be monitored carefully for further periodontal tissue breakdown.

Topic: Periodontal clinical trials

## P0773

### A comparative study of FOA and Invisalign treatment on the Periodontal health status of patients

A. Azaripour, A.R. Mundethu, B. Willershausen

Mainz/Germany

**Aim:** Introduction: Fixed orthodontic appliances (FOA) could temporarily alloy the periodontal health conditions of patients. The increased niches complicate the implementation of oral hygiene procedures. In this study, the oral hygiene of two different patient groups treated either with FOA or Invisalign was evaluated.

**Material and Methods:** Periodontal parameters (GI, PI, API, SBI, CAL) of 100 Patients (50 with FOA and 50 with Invisalign) were evaluated through comprehensive clinical examinations. Dietary habits and oral hygiene difficulties were enquired through a specially prepared questionnaire. Comparative Statistical analysis was carried out using Mann-Whitney-U-Test and after Bonferroni correction a p-value <0.01 was obtained, showing a statistically significant difference between the two groups.

**Results:** In this study, comparatively better periodontal indices could be observed in the Invisalign patients. Less plaque (API: 23.33% compared to 37.25%) and gingival inflammations (SBI: 8.9% compared to 18.5%) were observed in the Invisalign group. No statistical differences between the clinical attachment level (CAL) and no association to dietary habits was observed in this study.

**Conclusion:** Although the whole tooth surfaces are covered with Aligners almost all day long, the implementation of oral hygiene seems to be easier with the Appliance since they are removable. The Invisalign patients could implement better oral hygiene procedures and therefore, enjoy better quality of life.

Topic: Periodontal clinical trials

## P0774

### Dentinal hypersensitivity: evaluation of three different therapeutic strategies

M. Gadeau, J. Braux, F. Mora, P. Bouchard

Paris/France

**Aim:** The purpose of this study is to evaluate three different therapeutic strategies for dentinal hypersensitivity

**Material and Methods:** Eighteen patients with dentinal were included. For each patient, the extend to the air index test and the recession were recorded. Patients underwent either polishing using the Colgate® Sensitive Pro-Relife paste, or a surgical approach (coronally advanced flap technique or tunnel technique associated with a connective tissue graft). Three and five weeks after completion of therapy, the air index test and the percentage of root coverage were re-assessed.

**Results:** After periodontal plastic surgery, complete root coverage of the recessions were obtained in 81% of the cases. No statistically significant differences were observed (Kruskall-Wallis test) between the three therapeutic groups in terms of improvement of the dentinal hypersensitivity: no treatment was superior to others.

**Conclusion:** Today, the therapeutic decision-making deal with dentinal hypersensitivity cannot be done without a precise knowledge of the etiologies and clinical evaluations of our treatment. Through some clinical cases we will try to conclude on the results obtained with the three treatment strategies, and what decision criteria emerge.

Topic: Periodontal clinical trials

## P0775

### Microbiological evaluation of a protocol of subgingival debridement with Er:YAG laser in comparison to ultrasonic debridement: a randomized clinical trial

A. Ortiz-Vigón, I. Sanz, A.R. Matos, D. Herrera, M. Sanz

Madrid/Spain

**Aim:** This randomized, clinical trial aimed to assess the microbiologic effect of a non-surgical periodontal treatment protocol with the adjunctive use of erbiumdoped: yttrium-aluminum-garnet (Er:YAG) laser in comparison with a conventional protocol.

**Material and Methods:** Patients diagnosed of chronic periodontitis were randomly assigned to two different treatment protocols: a single session of full-mouth subgingival instrumentation using a piezoceramic ultrasonic device, with the adjunctive use of an Er-YAG Laser (Kavo Key III) one week later in those pockets with an initial PPD > 5 mm; or subgingival instrumentation using the same ultrasonic device in two sessions with one week interval. Clinical and microbiological (culturebased) parameters were recorded at baseline, 1, 3, 6 and 12 months. Clinical variables included pocket closure and microbiological variables included total counts, frequency of detection, proportions and counts of target species.

**Results:** 39 patients were included in the study, 19 in the test and 21 in the control group. The mean number of open pockets showed a statistical significant reduction between baseline and 12 months (p

**Conclusion:** The results demonstrate that the adjunctive use of Er:YAG laser to conventional ultrasonic debridement did not provide added benefit in relation to the microbiological changes.

Topic: Periodontal therapy

**P0776**

### New Ways of Managing Periodontal Diseases for the Benefit of our Patients

P.N. Galgut

1qw/United Kingdom

**Aim:** To consider how emerging research indicating that the host reaction to presence of dental plaque biofilm is the key factor in initiating periodontal diseases and how this is changing our clinical management of periodontal diseases.

**Material and Methods:** This presentation is a review of the literature and an update on treatment strategies arising from it.

**Results:** As a result the management of periodontal diseases has become more complex, and not limited to simple mechanical debridement of root surfaces as in the past. Topical and systemic pharmacological adjuncts are increasingly being used to improve treatment outcomes.

**Conclusion:** The importance of anti-inflammatories is evident as the realisation that not only must plaque be eliminated, but the immune system needs to be managed more effectively to reverse the destructive processes and promote healing.

Topic: Periodontal therapy

**P0777**

### Could be the dental hygienist a problem in the dental team?

I. Drizhal

Hradec Kralove/Czech Republic

**Aim:** Dental team is composed of dentist, dental assistant, dental technician and in many countries a new member, dental hygienist. Position and duties of the first three mentioned are attested. Position of dental hygienist is frequently for some dentists not quite clear.

**Material and Methods:** Dental hygienist is under the supervision of a dentist.

What is expected from the dental hygienist by the dentist?

1. collaboration in prevention and treatment of periodontal diseases - the competence is fully accepted by dentist - she works under supervision - mostly periodontologist
2. improvement of the reputation of dental surgery - dental hygienist works without supervision - mostly general dental practitioner
3. she is evaluated as useful - she works under supervision - orthodontist
4. she is not supervised in the right way - there are not precisely defined requirements - implantologists Comparison of pregraduate education of dental hygienists (bachelor) and dentists- some subjects (in the Czech Republic):

*preventive dentistry:*

dentists 27 lectures and seminars / dent. hyg. 144 lectures and seminars

*periodontology:*

dentists 69 lectures and seminars / dent. hyg. 126 lectures and seminars

**Results:** Many dentists are not able to realize proper treatment plan -for example to indicate periodontal surgery. But dental hygienists know that periodontal pockets after initial phase 6mm and more are indication for periodontal surgery(not always).

**Conclusion:** Some problems are arising from discrepancy between education of dental hygienists and the reality in daily practice.

Topic: Periodontal therapy

**P0778**

### Study of the influence of type and severity of the periodontal disease in dentinal hypersensitivity

R. Marco Pitarch, J. Molina Hernandez, M.S. Martí Magraner, F. Gil Loscos, F. Alpiste Illueca

Valencia/Spain

**Aim:** Dentinal hypersensitivity (DS) is the pain that rises from an exposed dentin as a reaction to chemical, tactile or osmotic stimuli. The diversity of the methodology used and the studied populations have resulted in prevalence studies with a great variation. The gingival recession and the periodontal treatment are associated with the presence of DS. However, the relation between the type and severity of the periodontal disease and the prevalence of DS hasn't been considered, therefore we would like to study the prevalence of DS in untreated periodontal patients analyzing the relationship of DS and periodontal diagnosis and several factors that could influence in this association.

**Material and Methods:** 1283 questionnaires of periodontal patients completed during the first visit in an exclusive periodontal clinic were evaluated. DS, clinical parameters, smoking, parafunctional and hygienic habits were analyzed. The periodontal diagnosis was made by a periodontal specialist. Patients that had been previously treated periodontally and that had decayed restorations or pulpitis diagnosis were excluded.

**Results:** 84.8% of the patients had DS. DS was significantly related with periodontal severity (p-value 0.008). The presence of DS to different stimuli varied depending on the smoking and bruxist habit of the patients, however the gingival recession wasn't significantly associated with DS.

**Conclusion:** The knowledge of an association between the periodontal diagnosis and DS could be of great usefulness to determine our treatment plan.

Topic: Periodontal therapy

**P0779**

### Anxiety and pain perception during staged versus 24-h root surface debridement in chronic periodontitis patients.

V.K. Naik, A. Balasundaram

600089/India

**Aim:** To assess pre procedural anxiety levels and post operative

pain perception in chronic periodontitis patients who were undergoing staged versus 24-h root surface debridement.

**Material and Methods:** In this clinical study total 22 patients of chronic periodontitis were participated. The patients were randomly assigned in Group I and Group II. Group I being Staged RSD [root surface debridement], Group II being 24-hours RSD. Prior to the start of the procedure patients completed anxiety questionnaire consisting of 7 questions with 5 possible answers [Adopted from Chung et al 2003]. Assessment of pain was done using visual analogue scale [VAS] post operatively. Treatment time was recorded to assess the efficiency of calculus removal.

**Results:** Mean overall anxiety score was  $1.42 \pm 0.46$  in group I and  $1.40 \pm 0.44$  in group II. Mean pain score was  $0.92 \pm 0.98$  in group I and  $1.64 \pm 1.63$  in group II. the anxiety score was significantly higher in women in both the groups. [ $P=0.01$ ] Statistical significant pain scores were found between 4th visit of group I ( $0.45 \pm 0.93$ ) and group II ( $1.64 \pm 1.63$ ) [ $P=0.047$ ]

**Conclusion:** Recognition of patients who are likely to experience anxiety and pain during root surface debridement procedure can be facilitated by dental anxiety questionnaire and visual analogue scores. This study suggested that anxiety and pain perception among dental patients tend to decline with staged root surface debridement. This can further improve patients' attendance to dentist and may enhance the dentist-patient interactions. Finally staged root surface debridement procedure seems to offer patient centered benefits than the 24-h root surface debridement procedure.

#### Topic: Periodontal therapy

### P0780

#### Anxiety and post operative pain perception during staged versus 24-h root surface debridement in chronic periodontitis patients.

V.K. Naik, A. Balasundaram  
Chennai/India

**Aim:** To evaluate pre procedural anxiety and post operative pain perception in chronic periodontitis patients who were undergoing staged versus 24-hours root surface debridement procedures

**Material and Methods:** In this clinical study total of 22 patients of chronic periodontitis patients were participated. patients were randomly assigned in group I [Staged] and group II [24-h root surface debridement]. Prior to the start of the procedure patient completed anxiety questionnaire, consisting of 7 questions with 5 possible answers [Adopted from Chung et al 2003]. Pain perception was assessed using visual analogue scale, post operatively.

**Results:** The study indicated the decline in anxiety scores in group I compared group II and there was statistically significant difference in pain scores of the fourth visit of group I of ( $0.45 \pm 0.93$ ) and group II ( $1.64 \pm 1.63$ ) [ $P=0.047$ ]. Mean overall anxiety score was  $1.42 \pm 0.46$  in group I and  $1.40 \pm 0.44$  in group II. Mean pain score was  $0.92 \pm 0.98$  in group I and  $1.64 \pm 1.63$  in group II. The anxiety scores were significantly higher in women in both the groups [ $P=0.01$ ]

**Conclusion:** Recognition of patients who are likely to experience anxiety and pain during root surface debridement can be facilitated by dental anxiety scale and visual analogue scale. Although this study did not show any statistically significant

scores between the groups, the trend suggested staged RSD would be favorable for those patients who are likely to experience pain and anxiety during the procedure.

#### Topic: Periodontal therapy

### P0781

#### Impact of obesity on the immediate response to the initial treatment of generalized chronic periodontitis: a clinical study.

W. Bouaziz Zouaoui, J.L. Davideau, H. Tenenbaum  
Strasbourg/France

**Aim:** To compare the quality of the immediate clinical response to the initial therapy of chronic periodontitis between obese and non-obese patients.

**Material and Methods:** New patients with chronic generalized periodontitis were enrolled from the department of periodontology in Strasbourg-France. The exclusion criteria were smoking, diabetes, pregnancy, inflammatory disease and antibiotics in the last six months. The clinical parameters (Gingival Index, Bleeding On Probing, Plaque Index, Probing Depth, Attachment Level) were recorded before the treatment, at 3 and 6 months after initial therapy.

**Results:** 40 cases of generalized chronic periodontitis (moderate to severe) were included in two groups. The test group was composed of 20 obese patients ( $BMI > 30$ ). The control group was composed of 20 non-obese patients ( $20 < BMI < 25$ ). All the clinical parameters improved significantly in the two groups without statistical significant difference, but with slight indication of slower response in the test group.

**Conclusion:** The results of this study indicate that obesity alone does not clinically impact the immediate results of the initial therapy of generalized chronic periodontitis. But further investigation is required to evaluate the long term results of the treatment of chronic periodontitis in obese patients.

#### Topic: Periodontal therapy

### P0782

#### Description of three-dimensional ultrasonic scaler oscillations with a highspeed camera

J.M. Emmelmann<sup>1</sup>, A. Mayr<sup>2</sup>, W. Wegscheider<sup>1</sup>, H. Bischof<sup>1</sup>, G. Wimmer<sup>1</sup>

<sup>1</sup>Graz/Austria, <sup>2</sup>Imst/Austria

**Aim:** It is evident that the debridement of plaque and calculus from root and tooth surfaces forms a main area in periodontal therapy. Efficiency of plaque removal and avoidance of damages on root surfaces depends on movement patterns of the ultrasonic scaler probes used for this purpose. High-frequency oscillation patterns of ultrasonic scaler tips can be slow-motion pictured by using a high speed camera system. The movement patterns can then be analyzed and evaluated. The aim is to generate probes and operating procedures to achieve an effective and gentle removal of adherent material on root surfaces.



**Material and Methods:** The movement of different commercial ultrasonic scaler probes is filmed with a Vision Research Phantom v710 high-speed camera in an unloaded and loaded mode (50g/100g) with a rate of 600.000 pictures/sec. In order to estimate the probe's movement the optical flow field of two consecutive images is examined. Optical flow describes the apparent motion of the image brightness pattern that can be equated to the object's movement under certain assumptions.

**Results:** A probability of the scaler probe's presence can be generated by examining the motion trajectories. Also, long term evaluations of the motion trend and its deviances can be established.

**Conclusion:** Slow-motion pictures of probe movements and three-dimensional visualisations seem to be a good method to gain information of the factual movement patterns of ultrasonic scaler probes. Efficient operating procedures of root debridement can be established and new optimised devices can be developed with standardised shooting procedures in collaboration with manufacturers.

**Conclusion:** Slow-motion pictures of probe movements and three-dimensional visualisations seem to be a good method to gain information of the factual movement patterns of ultrasonic scaler probes. Efficient operating procedures of root debridement can be established and new optimised devices can be developed with standardised shooting procedures in collaboration with manufacturers.

Topic: Periodontal therapy

P0783

### The Effect of Ozone Therapy in Periodontal Disease Treatment

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<sup>1</sup>Istanbul/Turkey, <sup>2</sup>Ankara/Turkey, <sup>3</sup>Leuven/Belgium

**Aim:** Ozone is naturally occurred, one of the most important oxidants. It has been used in periodontal therapy because of its high antioxidant property. The aim of this study is to evaluate the effect of ozone therapy with conventional periodontal therapy in periodontitis treatment.

**Material and Methods:** Seventeen aggressive and twelve chronic periodontitis patients were included to study. There were two sub-groups (SRP and SRP+Ozone therapy) of each periodontitis group. SRP and SRP+Ozone were performed in regions with pocket depth  $\geq 5$  mm symmetrically. To assess the microbiological changes, gingival crevicular fluid (GCF) samples were collected on three different time periods: before procedure, next day and three months later after procedure. The samples were analyzed with q-PCR and DGGE techniques.

**Results:** GCF volumes of the SRP+Ozone group have lower levels than only SRP group after three months. Results of microbiological analysis indicate that amount of total bacteria of both aggressive and chronic patients are lower in SRP+Ozone group. Bleeding on probing is lower in the group of ozone therapy.

**Conclusion:** Ozone therapy could be useful in clinical practice. Furthermore it could be a new option for maintenance. We still need more data.

Topic: Periodontal therapy

P0784

### The use of dermal fillers to optimize gingival contours - case series

A.E. Petre, S. Drafta, V. Naicu

Bucharest/Romania

**Aim:** "Black triangles" cause esthetical and phonetic problems as well as food retention after placing fixed prosthetic restorations on natural teeth, dental implants or after periodontal surgery. The restorative options are diverse and sometimes unpredictable. A fast, conservative and minimally invasive procedure is the injection of dermal fillers for increasing papillae volume. The aim of the study is to find the average value of volume increase of the papillae that can be achieved by injecting dermal fillers and the papillae volumetric change in time.

**Material and Methods:** The study was carried on a group of 36 patients (19 females, 17 males), mean age 44 with different degrees of gingival contours deficiencies. 9 of the patients had fixed dental supported prostheses, 7 implant supported restorations and 14 patients had papillae deficiencies between natural teeth. The study was performed after a standardized working protocol of injecting dermal fillers in papillae, digital photographing and monthly measuring the outcomes for observation periods between 3 to 11 months. The data was statistically analyzed.

**Results:** Injecting dermal fillers in gingiva has determined a volume raise of papillae by 25% (1,45 mm average in height). The papillae volume is starting to decrease in about 4 months, with a rapid decrease in the 5 and 6-th month, but in several cases the result lasted after 11 months observation time.

**Conclusion:** The use of dermal fillers is a minimally invasive way to optimize gingival contours. The procedure is fast and the results last on average for over 6 months.

Topic: Periodontal therapy

P0785

### Treatment of Multiple Adjacent Miller Class I and II Recessions with the Modified Coronally Advanced Tunnel, Emdogain® and Connective Tissue Grafts

A. Sculean<sup>1</sup>, O. Laugisch<sup>1</sup>, R. Alessandri Bieri<sup>1</sup>, S. Aroca<sup>1</sup>, P. Hofmänner<sup>1</sup>, A. Stravopoulos<sup>2</sup>

<sup>1</sup>Bern/Switzerland, <sup>2</sup>Aarhus C/Denmark

**Aim:** Predictable coverage of multiple adjacent gingival recessions still represents a major challenge for the clinician. Esthetic concerns and root sensitivity are the major indications for treatment of buccal gingival recessions. The modified coronally advanced tunneling technique (MCAT) avoids placement of vertical releasing incisions thus minimizing scar tissue formation and improving graft survival. More recently, the use of enamel matrix protein derivative (EMD) (Straumann Emdogain(R)), Basel, Switzerland) as adjunct for root coverage procedures has been proposed aiming at improving the clinical or histological outcome of treatment. To date, however, the data on the treatment of multiple adjacent Miller Class I and II recessions with MCAT in combination with a subepithelial connective

tissue graft (CTG) and application of EMD are still limited. The aim was to evaluate the outcome of treatment of multiple buccal gingival recessions with MCAT in combination with CTG and EMD.

**Material and Methods:** Multiple adjacent Miller Class I and II recessions (recession depth  $\geq 3$  mm) were consecutively treated with MCAT+CTG+EMD by one experienced surgeon. Healing was evaluated clinically 12 months after surgery.

**Results:** Complete root coverage was obtained in 88% recessions, while the rest of the sites showed 1-2 mm remaining recession. Probing pocket depth in the treated sites was never  $>3$  mm. No scar tissue formation and excellent tissue blending of the treated sites with the surrounding teeth were observed.

**Conclusion:** These data results suggest that the employed technique may represent a viable treatment option for the treatment of multiple Miller Class I and II buccal recessions.

## Topic: Periodontal therapy

### P0786

#### Comparison of diode laser and conventinal technique on frenectomy surgery

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**Aim:** Objective: In conventional frenectomy surgery, scalpels have been used for their ease of use, accuracy and minimal damage to surrounding soft tissue. The aim of this study was to compare the clinical efficacy and the postoperative complaints of patients following frenectomy surgery with diode laser or scalpel.

**Material and Methods:** Materials and Methods: Thirty-six patients aged between 14 and 51 requiring frenectomy were included in the study. Twenty patients treated with 2.8 W diode laser, 16 patients treated with conventional frenectomy technique. Soft tissue measurements were recorded before surgery, during first week, at 1st, 3rd and 6th month. Functional complications and the level of pain, swelling, redness were also evaluated using a visual analog scale.

**Results:** All patients showed sufficient coagulation in cutting region in laser group. No bleeding occurred during the procedure. All -patients treated with scalpel needed local anesthesia however only 8 patients in laser group needed anesthesia. The VAS scores of pain differences between the groups were statistically significant at day 2. The laser group was exhibited statistically significant less degree of functional complications during chewing, speaking at day 1-2. Concurrently swelling score was significantly higher in conventional group at day 3-5. Clinical measurements made before the operation after one week and one month indicated clear gain in width of keratinized gingiva and attached gingiva in both groups. These results remained stable during first month.

**Conclusion:** Considering the results above, diode laser offers a safe, effective, acceptable alternative for frenectomy operations.

## Topic: Periodontal therapy

### P0787

#### Nonsurgical treatment of peri-implantitis with mechanical debridement and subsequent diode laser irradiation

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Bern/Switzerland

**Aim:** Treatment of peri-implantitis still represents a major challenge for the clinician. Until now, the data from the literature indicate that nonsurgical treatment of peri-implantitis does not seem to predictably improve soft and hard tissue parameters in deep peri-implantitis lesions. To evaluate the outcomes following nonsurgical therapy of peri-implantitis with deep scaling and diode laser irradiation.

**Material and Methods:** 92 consecutively treated peri-implantitis lesions exhibiting probing depths of 6-12 mm with bleeding on probing and/or pus were consecutively treated with nonsurgical therapy including deep scaling under local anesthesia followed by 3 subsequent sessions of diode laser irradiation (WhiteStar, 810nm; 2.5 Watt).

**Results:** At 3 months following treatment, 33 out of the 92 treated implants did not show any signs of BOP or pus with probing depths (PD) measured  $< 5$ mm. The x-rays indicated an almost complete radiographic hard tissue fill in these cases.

**Conclusion:** The results indicate that nonsurgical treatment of deep peri-implantitis lesions including deep scaling followed by 3 subsequent sessions of diode laser application resulted in significant clinical improvements and defect resolution in 30 % of the treated cases, thus pointing to the potential clinical benefit of using diode laser irradiation following mechanical nonsurgical therapy.

## Topic: Clinical Research: Periodontal Therapy

### P0788

#### Tooth Brushing Education via Software Visualization – Efficiency of the Modified Bass Technique

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**Aim:** Recently we developed a digital toothbrush monitoring and training system (DTS) to interactively educate correct brushing motion and grip axis orientation at home. The aim of the present study was to evaluate the effect of the DTS on the performance of the modified Bass technique (MBT).

**Material and Methods:** 21 subjects (11 test group, DTSG /10 control group, COG) received conventional instructions of MBT after professional tooth cleaning (T0). After 36h (T1) without

any mechanical oral hygiene the plaque index was measured and brushing technique reviewed. Following randomization subjects performed tooth brushing for six weeks (T2) with the provided kits in COG, and additionally the DTS in DTSG. During the following eight weeks (T3) participants used their original brushing devices without any interference. Investigators were blinded at each visit. Data were statistically evaluated using probate parametric and non-parametric tests ( $p < 0.05$ ).

**Results:** At T0 27.27% of the DTSG participants employed the MBT correctly (COG: 50%), increasing to 54.55% (COG: 60%) after professional instruction (T1) and to 90.91% at T2 (COG: 60%) ( $p < 0.001$ ). During this time 72.73% of DTSG participants improved their brushing technique (COG: 20%) ( $p < 0.001$ ). At T2 the plaque score decreased in DTSG ( $p < 0.05$ ). At T3 80% of the DTSG participants (COG: 40%) totally adopted the MBT ( $p < 0.05$ ). At T0 brushing time in DTSG was  $163.8 \pm 30.7$  s (COG:  $157.0 \pm 30.8$  s) and increased to  $213.8 \pm 57.1$  s at T2 (COG:  $162.1 \pm 43.3$  s) ( $p < 0.05$ ).

**Conclusion:** The presented DTS effectively improves the brushing technique performance and leads to a long-term learning effect.

Topic: Clinical Research: Periodontal Therapy

P0789

### Antimicrobial efficacy of new, in-situ forming, controlled-release, antiseptic-loaded, biodegradable gel

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Szeged/Hungary

**Aim:** The aim of this in-vitro study was to evaluate of antimicrobial efficacy of new, in-situ forming, biodegradable gel for controlled delivery of different antiseptics.

**Material and Methods:** Subgingival samples were collected by sterile paper-points and Langer curettes from active site of AgP patients and from periodontal abscess. Culture method was used to isolate and identify all of the putative periodontal pathogens and their susceptibilities to different antiseptic-loaded gel were tested by the diffusion tests. The diffuse the drugs were allowed for 2-3-5 days and observe the effect of drug on seeded bacterium in the form of zone of inhibition.

**Results:** A complex aerobic/anaerobic bacterial flora were isolated and investigated with biodegradable gel of 5 different antiseptics. No inhibition zones were found after 2, 3 or 5 days of incubation of 3 different antiseptics, only the Povidone Iodine containing gels in a different concentration shown inhibition zones after the incubation period. There were no differences between the zone diameters after the different incubation days. Compare the biodegradable gel of different antiseptics the control metronidazole disks have shown stable zone diameters throughout the investigation period.

**Conclusion:** While the Povidone Iodine containing gel significantly suppress most subgingival pathogenic microorganisms, the nano silver containing device has not antimicrobial efficacy on periodontopathogenic bacteria.

Topic: Clinical Research: Periodontal Therapy

P0791

### The effect of nonsurgical periodontal therapy on the level of HNP 1-3 in GCF in chronic periodontitis patients.

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**Aim:** The aim of the study was to assess the presence of HNP 1-3 in the GCF of chronic periodontitis patients before and after nonsurgical periodontal therapy.

**Material and Methods:** Nineteen generally healthy patients with chronic periodontitis were included to the study. Prior to therapy, 3 and 6 months post treatment, each patient underwent periodontal examination to determine PPD, GR, CAL, PI and BOP as well as GCF collection from the pocket (PPD  $\geq$  4mm) chosen on the first visit. The level of HNP1-3 in GCF was determined by means of a commercially available ELISA kit. All the patients received periodontal treatment involving SRP with additional systemic antibiotic therapy (Amoxicillin 3x 375 mg/d + Metronidazole 3 x 250 mg/d for 7 days).

**Results:** The periodontal therapy caused a statistically significant decrease of all evaluated clinical at the sites of sample collection except for BOP. The level of HNP 1-3 per measure point showed a statistically significant increase. Gingival fluid volume showed statistically significant decrease. Spearman's rank correlations showed average negative correlation between the level of  $\text{I}\pm$ -defensins expressed as pg/site and CAL and strong correlation between CAL and SFFR after 6 months.

**Conclusion:** The study showed an increase in the overall amount of  $\text{I}\pm$ -defensins in GCF after nonsurgical periodontal therapy using systemic antibiotic therapy. Based on the above data, it can be stated that  $\text{I}\pm$ -defensins take part in the host defense during ongoing chronic periodontitis but further studies are needed to fully elucidate the role of HNP1-3 in periodontal diseases.

Topic: Clinical Research: Periodontal Therapy

P0792

### Comparison of nonsurgical periodontal therapy combined with PDT or with antibiotic therapy affect on the clinical parameters and MMP- 8 and -9 GCF concentrations in chronic periodontitis patients.

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**Aim:** The aim of the study was comparison between nonsurgical periodontal therapy with the use of photodynamic therapy (PDT) and nonsurgical periodontal therapy combine with antibiotic therapy impact on clinical parameters and MMP- 8 and -9 GCF concentrations in chronic periodontitis patients.

**Material and Methods:** Forty generally healthy patients with chronic periodontitis (CP) were randomly divided into two groups: 1 - treated with scaling and root planing (SRP) followed

by one PDT session with the use of Helbo system (bredent medical GmbH & Co. KG, Germany) and 2 – treated with SRP with additional systemic antibiotic therapy (Amoxicillin 3x 375 mg/d + Metronidazole 3 x 250 mg/d for 7 days). Prior to therapy, 3 and 6 months post therapy GCF from pockets with PPD $\geq$  4mm was collected to determine MMP-8 and -9 concentrations by commercially available ELISA kit as well as periodontal examinations were performed (PPD, GR, CAL, PI and BOP at the sites of sample collection).

**Results:** In both groups PI and PPD values reduced significantly after treatment. CAL and BOP values dropped significantly only after SRP and antibiotic therapy. Decrease of MMP- 8 and -9 concentrations was observed in both groups, but only statistically significance concerned MMP-8 in the second group. There were no differences in evaluated parameters between study groups.

**Conclusion:** Based on this findings, it can be concluded that SRP with PDT or with antibiotic have statistically significant influence on clinical parameters and MMP-8 and -9 GCF concentrations in CP patients.

## Topic: Clinical Research: Periodontal Therapy

### P0793

#### Comparison of nonsurgical periodontal therapy combined with PDT or with antibiotic therapy affect on the clinical parameters and MMP- 8 and -9 GCF concentrations in aggressive periodontitis patients.

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**Aim:** The aim was to compare nonsurgical periodontal therapy with use of photodynamic therapy (PDT) or periodontal therapy with use of antibiotic therapy impact on MMP- 8 and -9 GCF concentrations in aggressive periodontitis patients.

**Material and Methods:** Two groups of AP patients were selected: 1 – treated with scaling and root planing (SRP) followed by PDT (Helbo system, bredent medical GmbH & Co. KG), 2 – treated with SRP with systemic antibiotic therapy (Amoxicillin a 0.375mg 3xdaily for 7 days and Metronidazole a 0.25mg 3xdaily for 7 days). Prior to therapy, 3 and 6 months post therapy GCF from pockets with PPD $\geq$  4mm was collected to determine MMP-8 and -9 concentrations. Also periodontal examinations were performed to assess PPD, CAL, PI and BOP at the sites of sample collection.

**Results:** In both groups PI and PPD values reduced significantly after treatment as well as BOP but only in the second group. CAL values after SRP with antibiotic were similar when compared to baseline. Both groups improved statistically significantly in terms of PD reduction compared to baseline. Treatment with amoxicillin + metronidazole yielded higher PD improvements compared with the group treated with SRP and PDT. Decrease of MMP- 8 and -9 concentrations was observed in both groups, but only statistically significance concerned MMP-8 in the second group. MMP-8 concentration was significantly higher in the group treated with SRP with PDT after treatment.

**Conclusion:** Within the limits of this study SRP with PDT or with antibiotic have significant influence on MMP-8 and -9 GCF concentrations in AP patients.

## Topic: Clinical Research: Periodontal Therapy

### P0794

#### Effects of ultrasonic debridement with PVP-iodine irrigation on post-treatment bacteraemia compared to ultrasonic debridement with water

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Zürich/Switzerland

**Aim:** To evaluate the effect of pvp-iodine irrigation as an adjunct to deep scaling on post-treatment bacteraemia in the central blood flow in comparison to water irrigation

**Material and Methods:** Twelve patients with severe periodontitis ( $\geq$ 2 sites  $\geq$ 5 mm per jaw side) were treated as both test and control group with pvp-iodine (p) or tap water (w) irrigation in addition to ultrasonic deep scaling (crossover split-mouth design). Group order and allocation (left or right half of jaw) was assigned randomly. Treatment protocol for test and (control) groups was as follows: 1. Mouth rinse with p (w) for one minute. 2. Ultrasonic deep scaling of all sites using p (w) for one minute 3. Blood sampling from the bicuspidal vein two minutes after ultrasonic scaling. 4. Blood samples were centrifuged and subsequently cultured for 48h in both anaerobic and aerobic conditions on different culture mediums. 5. Bacteria colonies were differentiated and identified. 6. After at least 14 days conduction of the pending treatment group of the opposite jaw sides. Intergroup difference was calculated and tested on significance (Wilcoxon test).

**Results:** Post-treatment bacteraemia with oral bacteria was detected 6 times after control treatment but only once after test treatment with pvp-iodine. Wilcoxon test showed a significantly lower incidence of bacteraemia caused by oral bacteria for the test group ( $p = 0.028$ ).

**Conclusion:** Irrigation with 10% pvp-iodine may reduce the risk of post-treatment bacteraemia after deep scaling and may hence be recommended for the treatment of risk patients.

## Topic: Clinical Research: Periodontal Therapy

### P0796

#### Effect of probiotics on clinical parameters of gingivitis

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**Aim:** The aim of this study was to assess the effects of a Lactobacillus acidophilus and Bifidobacterium bifidus containing Turkish probiotic preparation consumption on clinical parameters of experimental gingivitis in 7-day model.

**Material and Methods:** The study involved 20 volunteers with gingival health. In order to compose the control group (C-group) on day 0 plaque index (PI), gingival index (GI), probing pocket depth (PPD) were recorded and individual mechanical and chemical plaque control were suspended for a week. At day 7 PI, GI and PPD were recorded, subjects received professional prophylaxis. For next 7 days they performed proper oral hygiene measures and received probiotic preparation once a day. After 7 days, to compose the test group (T-group) measurements were repeated, individual plaque control were suspended for 7 days,



still receiving probiotic preparation once a day. After 7 days PI, GI, and PPD were recorded. Data were analysed by Wilcoxon sign test and Paired sample t test.

**Results:** There was a significant increase in the mean PI, GI and PPD within all groups during the study period. The increase in the mean values of PI, GI and PPD were statistically significantly less in T-group than C-Group ( $p < 0.01$ ).

**Conclusion:** The results suggest that probiotics may have beneficial effect on progression of gingivitis and the use of probiotics in gingival inflammation requires further documentation.

Topic: Clinical Research: Periodontal Therapy

**P0797**

### A comparative study about the effects of three different ultrasonic scalers on the enamel surface profile

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**Aim:** The present study compares the enamel surface characteristics and the effectiveness of calculus removing by using three different ultrasonic scalers in initial periodontal therapy: a magnetostrictive one, XO Odontogain® and two piezoelectric tools – Satelec Suprasson P5 Booster® and Satelec P5 Newtron XS®.

**Material and Methods:** Three experimental groups of 15 teeth with calculus were treated with one of the three tools. Instrumentation was performed during a period of 3 to 5 minutes per tooth, under permanent irrigation with Listerine®, until the tooth surface felt hard and smooth to an explorer tip. Before and after treatment, the tooth surface characteristics were examined using a scanning electron microscopy, in order to emphasize 3D topography features. The effectiveness of instrumentation was estimated using the remaining calculus index (RCI).

**Results:** Digital images showed that the ultrasonic treatment causes alterations of the tooth surface, consisting in enamel scratches, different in shape and depth. Each of the three units provides a texture featuring a particularly design. The magnetostrictive unit causes less enamel destruction. RCI did not differ significantly among the three groups.

**Conclusion:** All three scalers are efficient and represent a reasonable choice for gentle periodontal treatment.

Topic: Clinical Research: Periodontal Therapy

**P0798**

### Evaluation of the effects of platelet rich plasma on graft dimensions and clinical attachment level after free gingival graft procedures.

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**Aim:** Healing may be compromised in free gingival graft operations, which is one of the most common used techniques in order to increase the width of attached gingiva. Platelet rich plasma can accelerate soft tissue healing via increased growth factor release. The aim of the present study is to evaluate the effects of PRP on graft dimensions and clinical attachment level.

**Material and Methods:** 36 defects in which 18 were split-mouth are included. The patients in experimental group were treated using free gingival graft with platelet rich plasma, the patients in control group were treated using free gingival graft alone. Vertical recession, probing depth, clinical attachment level and graft dimensions such as vertical and horizontal dimensions and graft thickness were recorded at operation day, 1st, 3rd, 6th and 12th months.

**Results:** Graft thickness and differences between horizontal and vertical shrinkage were significantly higher in the experimental group. Clinical attachment levels decreased significantly in the experimental group. The amount of creeping attachment was significantly higher in the experimental group. In the split-mouth group, vertical graft dimension and graft thickness were also found to be higher in the experimental group.

**Conclusion:** Our findings suggest that the use of platelet rich plasma in the free gingival graft procedures have a positive effect on graft size and clinical attachment level.

Topic: Clinical Research: Periodontal Therapy

**P0799**

### Predictors of initial compliance in periodontal patients

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**Aim:** Besides operating skills, the communication between therapists and patients is an important issue concerning compliance in supportive periodontal therapy programs (SPT). The present investigation was designed to identify initial predictors of SPT compliance.

**Material and Methods:** The dentist-patient communication regarding periodontal patients was analysed during the first appointment with the Roter Interaction Analysis System (RIAS). Additionally sociodemographic, psychological and periodontal parameters are included in the evaluation.

**Results:** In 41 patients, compliance with periodontal therapy was monitored over a 9 months period. The RIAS evaluated communication was doctor-centered. Appeasing words and optimism ( $p = 0.031$ ), furthermore psychosocial comments ( $p = 0.040$ ) by the dentist correlate significantly with compliance. Open ended questions and compliments tend to compliance, while open ended questions by the patients point to compliance ( $p = 0.042$ ). On the patient hand, extensive reporting about prior therapies is a predictor of non-compliance ( $p = 0.020$ ). Light bone loss, undergoing periodontal surgery and antibiotic therapy ( $p = 0.035$ ) correlate significantly with good participation. Higher educational background ( $p = 0.012$ ), private health insurance and juvenescent age ( $p = 0.041$ ) are predictors of patient compliance. Reduced oral health-related quality of life correlates with compliance ( $p = 0.015$ ). Depression suggests a significant poorer compliance ( $p = 0.043$ ). As far as stress exposure, satisfaction with the physician and locus of control are concerned, there are no hints for compliant behaviour.

**Conclusion:** Communication in the initial appointment can be indicative for compliance. A professional training of dentists' communication skills is desirable to ensure efficient and patient-centered communication, thus increasing the patient's motivation, and therefore to achieve a better therapeutic success.

## Topic: Clinical Research: Periodontal Therapy

## P0800

**Detection of pro-inflammatory cytokines in saliva and crevicular fluid (GCF) in periodontitis using the Luminex method**

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Gandra/Portugal

**Aim:** To evaluate the effect of nonsurgical periodontal treatment in the level of pro-inflammatory (IL-1, IL-6, TNF- $\alpha$ ) and immunosuppressor (IL-10) cytokines in gingival crevicular fluid (GCF) and in saliva, and compare the cytokine levels of periodontitis patients before therapy with normal periodontal subjects.

**Material and Methods:** GCF and saliva samples were collected from thirteen patients with moderate chronic periodontitis before and after nonsurgical periodontal therapy, and from two periodontal healthy controls. Cytokine levels were determined using a luminex method.

**Results:** Therapy resulted in a decrease in the total amount of IL-1 $\alpha$ , IL-1 $\beta$  and IL-6, but not IL-10 or TNF- $\alpha$ ; in GCF. Comparing with control subjects, untreated periodontitis patients exhibited higher amounts of all studied cytokines in GCF, but not in saliva. Moreover, we have found no correlation between any clinical parameter and the levels of cytokines.

**Conclusion:** This data shows that nonsurgical periodontal therapy reduces the levels of pro-inflammatory cytokines such as IL-1 and IL-6 in GCF. This supports other studies, indicating that these cytokines are important factors involved in the pathogenesis of periodontitis. However, given the multifactorial nature of the periodontitis, these parameters alone do not allow to predict the success of nonsurgical periodontal therapy.

## Topic: Clinical Research: Periodontal Therapy

## P0801

**Effects of Tetracycline Hydrochloride and Antimicrobial Photodynamic Therapy on experimentally induced periodontal disease.**

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**Aim:** The aim of this study was to evaluate the effects of tetracycline hydrochloride (TTC-HCL) associated with Antimicrobial Photodynamic Therapy (aPDT) as an adjunctive therapy to scaling and root planning (SRP) treatment of induced periodontal disease (IPD) in rats.

**Material and Methods:** IPD was induced in 60 rats through introduction of a cotton thread around the first left mandibular molar. After 7 days, the ligature was removed and animals were randomly divided into the following treatment groups (n=12): SRP, Scaling and Root Planing plus saline solution; TTC-HCL,

SRP plus TTC-HCL solution (100mg/ml); TTC-LLLT, SRP plus TTC-HCL (100 mg/ml) solution and low level laser therapy (LLLT; 660 nm; 4 J/cm<sup>2</sup>/point; 18 seconds); aPDT, SRP plus methylene blue (100  $\mu$ g/ml) followed LLLT (aPDT) and TTC-aPDT, SRP plus aPDT associated to TTC-HCL (100 mg/ml). Six animals of each group, at 7 and 15 days were euthanized. Bone loss (BL) in the furcation region was evaluated using histometric analysis. Data were statistically analyzed (P<0.05).

**Results:** In the histometric analysis the TTC-HCL(0.77 $\pm$ 0.10) and aPDT (0.89 $\pm$ 0.49; 1.15 $\pm$ 0.38) groups had significantly less bone loss than SRP (2.20 $\pm$ 0.51; 1.73 $\pm$ 0.25), at 7 and 15 days, respectively. It was observed no statistical significance difference between TTC-HCL and TTC-LLLT and between aPDT and TTC-aPDT treatments.

**Conclusion:** In conclusion, TTC-HCL and aPDT were effective adjunctive therapies to the treatment of IPD in rats. The association of aPDT with TTC-HCL did not produce additional benefits compared to isolate effects of both therapies.

## Topic: Clinical Research: Periodontal Therapy

## P0802

**Evaluation of Lactobacillus spp. and periopathogens occurrence in SRP and EMD therapy in chronic periodontitis**

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Poznan/Poland

**Aim:** The aim of study was to analyze the occurrence of Porphyromonas, Prevotella and Lactobacillus in patients with severe chronic periodontitis, after the SRP with Emdogain Gel (EMD) as a topical antiseptic.

**Material and Methods:** Materials and methods In 20 patients API, SBI, PPD, CAL were measured before and 3 months after treatment, in two selected quadrants. EMD was applied to the pockets two days after SRP. Samples of GCF were plated on Columbia and Rogosa agar, incubated at 37°C for 48-96 h in anaerobic conditions. Periopathogens were identified using rapid ID 32 A (bioMerieux) and Lactobacillus bacteria using API 50CHL (bioMerieux). Lactobacillus were plated on TMB-PLUS agar and cultured at 37°C for 48h in anaerobic conditions. Analysis was made using the Mann-Whitney and Wilcoxon tests.

**Results:** Results The SRP treatment with EMD and alone caused a significant change of all clinical parameters. In 11 patients before EMD application were detected. Lactobacillus was found in 9 individuals. After treatment periopathogens was not found, both in periodontal pockets with EMD and without EMD. Lactobacillus spp. was occurred only in the periodontal pockets without EMD.

**Conclusion:** SRP is an effective method of limiting the periopathogens in pockets  $\geq$  5 mm. SRP with EMD does not change the clinical parameters significantly, compared to the SRP. In parallel, using of EMD inhibits the development of both, periopathogens and lactobacilli.

Topic: Clinical Research: Periodontal Therapy

## P0803

### The use of photodynamic therapy in aggressive periodontitis, based on own research

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Zabrze/Poland

**Aim:** The purpose of the study was evaluation of photodynamic therapy as a method of treatment of aggressive periodontitis.

**Material and Methods:** 4 patients aged 25 to 41, with aggressive periodontitis, comprised the material of the research. Depth of periodontal pockets and degree of clinical attachment loss were measured. Moreover, the API and SBI indices were assessed and bacteriological PET examination was conducted before and after the photodynamic therapy.

**Results:** The use of photodynamic therapy resulted in significant improvement of the clinical state of patients, as well as in decrease of the number of pathogens or their total elimination in three of analyzed cases. In one case a deterioration of the clinical state and increase of the number of pathogens within the pathological pocket was observed.

**Conclusion:** However results of treating aggressive periodontitis supported by photodynamic therapy are promising, due to a small research group continuation of the research is necessary.

Topic: Clinical Research: Periodontal Therapy

## P0804

### Comparison of surgical treatment of advanced chronic periodontitis with use of xenological and alloplastic materials

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**Aim:** Clinical assessment of surgical treatment with use of Bio Oss Spongiosa® (Geistlich Pharma AG) heterogenic material and HT Biocer® (Chema, Rzeszów) biphasic ceramic material.

**Material and Methods:** The research was conducted on 15 treatment areas of pathological, two- and three-walled pockets (CAL > 5mm) in generally healthy, non-smoking patients. Depth of pockets (PPD), clinical attachment level (CAL) and recession were measured before the treatment, 6 and 12 months after the procedure. The results were processed with Friedman's statistical ANOVA test ( $p < 0.05$ ).

**Results:** During the follow-up examinations, the clinical state of the surgical treatment areas improved. Measurement and analysis of PPD and CAL conducted before the treatment, 6 and 12 months after the procedure, showed statistically significant reduction in both group.

**Conclusion:** The clinical assessments confirm effectiveness of the surgical treatment of advanced chronic periodontitis conducted with use of Bio Oss material and HT Biocer. The results in group treated with HT Biocer were statistically significant better.

Topic: Clinical Research: Periodontal Therapy

## P0805

### Influence of bone marrow aspirate on the healing of critical-size bony defects

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<sup>1</sup>Araçatuba/Brazil, <sup>2</sup>Lavras/Brazil

**Aim:** This study histomorphometrically evaluated the bone healing of critical-size defects (CSD) surgically created in rat calvaria and treated with bone marrow aspirate (BMA).

**Material and Methods:** 20 rats were divided into 2 groups: Group C (control) and Group BMA. A 5 mm diameter CSD was created in the calvarium of each animal. In Group C, the defect was filled with blood clot only. In Group BMA, the defect was filled with BMA. All animals were euthanized at 30 days postoperative. Newly formed bone area (NFBa) was calculated as a percentage of the total area of the original defect. Data were statistically analyzed (t test,  $p < 0.05$ ).

**Results:** Group BMA presented significantly more bone formation ( $32.17 \pm 15.14\%$ ) than Group C ( $13.75 \pm 4.32\%$ ).

**Conclusion:** Within the limits of this study, it can be concluded that BMA promoted bone formation in CSD in rat calvaria.

Topic: Clinical Research: Periodontal Therapy

## P0806

### To evaluate relationship between antioxidant, C-reactive proteins, cotinine levels and periodontal diseases in smokers.

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**Aim:** To evaluate the interrelationship between serum total antioxidant capacity, C-reactive proteins, cotinine levels and periodontal diseases in smokers and non smokers.

**Material and Methods:** Sixty seven male subjects were examined, with 33 (49.5%) who were smokers. The patients were divided into gingivitis and periodontitis groups. Blood samples were obtained. Serum cotinine level was analyzed using ELISA technique. Antioxidant capacity and C-reactive proteins were measured using the ferric reducing ability of plasma assay and the Beckman Coulter Image Immunochemistry System respectively. Visible plaque score, gingival bleeding index and community periodontal index were recorded.

**Results:** In smoker group, serum cotinine level increased ( $p = 0.001$ ), while antioxidant level decreased significantly ( $p = 0.001$ ). In gingivitis group, both serum cotinine ( $p = 0.001$ ) and antioxidant ( $p = 0.001$ ) levels were significantly difference in smokers, compared to non smoker groups. However, the periodontitis group demonstrated only a significant difference for cotinine level ( $p = 0.001$ ) in smoker, compared to non smoker groups. In smokers, a significant difference of C-reactive protein level was found between gingivitis and periodontitis groups. Mean plaque score and bleeding on probing score were found higher in smokers ( $p > 0.05$ ).

**Conclusion:** Smoking has more pronounced effects in periodontitis compared to gingivitis group. Several changes seem to be effected not only by smoking but also by severity of inflammation and destruction in periodontitis.

Topic: Clinical Research: Periodontal Therapy

## P0807

### Patient Outcomes Following Harvesting of Routine and Pre-Wounded Connective Tissue Grafts

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**Aim:** Pre-wounding, a form of surgical delay, has been used to improve skin graft outcomes but hasn't been used in oral procedures. The present study assessed patient outcomes at early postoperative times following harvesting of routine (R) and pre-wounded (PW) connective tissue grafts (CTGs).

**Material and Methods:** Systemically and periodontally healthy adults treatment planned for CTGs were recruited. Subjects were randomly assigned to the R (n=11) or the PW (n=10) group. Pre-wounding consisted of parallel incisions typical of routine CTG harvesting procedure made on the palate 5 days prior to harvesting. Subjects completed questionnaires (use of analgesics and VAS for pain at donor site) on postoperative (PO) days 3, 7, 14 and 21.

**Results:** There were no differences in pain prevalence between R and PW CTG groups, at any of the PO days ( $p>0.3$ ). Similarly, there were no differences in average VAS pain scores between R and PW CTG groups, at any of the PO days ( $p>0.3$ ). Average VAS scores decreased from PO day 3 to PO day 21. There was no difference in PO analgesic intake between R and PW groups ( $p>0.3$ ).

**Conclusion:** The harvesting of CTGs using a pre-wounding approach does not alter the postoperative morbidity associated with the routine harvesting of CTGs. Therefore, pre-wounding could be implemented for CTG harvesting, should it prove to be advantageous for root coverage outcomes.

Topic: Clinical Research: Periodontal Therapy

## P0808

### To use or not to use DOXYCYCLINE in periodontal therapy?

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Timisoara/Romania

**Aim:** The aim of the present study is to evaluate the effect of doxycycline on clinical parameters and gingival crevicular level of C reactive protein in chronic severe periodontitis.

**Material and Methods:** 31 adult patients with severe periodontitis were selected for this study, 17 female and 14 male, which were diagnosed and treated in the Department of Periodontology, UMF "Victor Babes" Timisoara. The patients were randomly distributed into 2 groups of 15 and 16 subjects, respectively. The control group received full mouth supragingival and subgingival disinfection and oral hygiene instructions. The test group received the same periodontal treatment, but in combination with an adjunctive antimicrobial therapy, consisting of systemic

administration of doxycycline. Supragingival and subgingival scaling and root planing were performed under local anesthesia using XO Odontogain device and Hu-Friedy periodontal Gracey curettes, respectively.

Clinical measurements and C reactive protein estimation were performed at baseline and 3 months after treatment.

**Results:** Clinical parameters of both groups significantly improved during the study. 3 months after therapy the test group exhibited significantly higher PD reduction in deep sites (baseline PD>7mm) compared to the control group (61.4% vs 39.7% for PD reduction>4mm). The C reactive protein level of the test group was significantly lower compared to baseline ( $P<0.0125$ ) and the control group ( $P<0.016$ ) after 3 months.

**Conclusion:** These results ensure further data for beneficial effects of adjunctive doxycycline therapy in the management of severe chronic periodontitis.

Topic: Clinical Research: Periodontal Therapy

## P0809

### Evaluation of low level laser irradiation on periodontal wound healing

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Prishtina/Serbia

**Aim:** Introduction: Normal periodontal surgical wounds healing are completed by exact phase and arrangement, in complete harmony with rigid dictate of biologic formula. Aim of the study: was to evaluate low level laser irradiation in wound healing rate after the periodontal surgery.

**Material and Methods:** 27 patients with mean age 29.5 years, was treated in Prishtina Dentistry School, Department of Periodontology and Oral Medicine. After periodontal surgery, wound was treating with low laser therapy, with Optica Laser's Scorpion SM405-7A diode laser. Low level laser therapy was done by monochromatic red spectrum of laser light with 630-650 nm length waves. One side of operated field was treated with 10 mA during 3 min with energy of 1.8 mJ, while another was control side.

**Results:** at gingivectomy we verify significant difference for rapidly healing of periodontal wound at the laser treated side, comparative with control side ( $p<0.05$ ).

**Conclusion:** Discussion and conclusions: These results are compatible with data of other authors, what result with conclusion that the low level laser irradiation fastens periodontal wound healing.

Topic: Clinical Research: Periodontal Therapy

## P0810

### Stability of teeth after resective therapy – intermediate analysis

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**Aim:** The aim of the study is to access clinical and radiographical stability of teeth after resective therapy compared to the contra lateral site of non resected teeth.

**Material and Methods:** A total number of 23 Patients (6 male) were re-examined after 7 +/-2.9 years in average clinically and radiographically. Inclusion criteria was: age  $\geq$  18years, resective surgical therapy in 1992 to 2008, OPT available before surgery, informed consent. Following parameters were considered at baseline and re-examination : Pocket probing depth, GBI, PCR, BOP for resected tooth (test) and contra lateral non resected tooth as control. The assessment of radiographic bone loss was performed with a Schei – ruler nearest to 10% using orthopantomographic images.

**Results:** The survival rate for the resected teeth among this group was 83,33%. Two teeth were lost according to periodontal breakdown, in one case according to root fracture and one was due to unknown reason. Concerning the mean bone loss at re examination the mean bone loss for resected teeth was 35.24 +/- 11,11 mm and 38,58 +/- 13.00 mm.

**Conclusion:** The resected teeth seem show a acceptable stability after 7+/-2,9 years of follow up and compared to the contra lateral non resected teeth the radiographical measurement show less bone loss at tested site.

Topic: Clinical Research: Periodontal Therapy

**P0811**

### Oral manifestations in a patient with Graft Versus Host Disease: A case report

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Erzurum/Turkey

**Aim:** Graft Versus Host Disease (GVHD) is a common but serious complication of allogeneic haematopoietic stem cell transplantation. Oral alterations of GVHD occur most of the patient with GVHD and may be early manifestation of this disease. The purpose of this case report was to present the unusual lesions of gingival tissues during, to understand and increase our knowledge about the oral alterations and the treatment required for GVHD.

**Material and Methods:** A 30-year-old woman was diagnosed with chronic myelocytic leukemia and underwent the allogeneic bone marrow transplantation. Appropriate therapy was initiated, and it received a good clinical response at all sites affected by GVHD, except in the oral cavity. She was referred to the periodontology clinic of the Faculty of Dentistry, persisting oral ulceration (mucositis), pain and xerostomia associated with GVHD. According to the clinical and radiographic findings, periodontal treatment was started with an initial phase of mechanical therapy; including systematic scaling and planning of all accessible root surfaces, improved oral hygiene, use of topical medications and monitored diet.

**Results:** The oral evolution of the disease was excellent and all oral manifestations were eliminated.

**Conclusion:** The management of GVDH can reduce oral alterations that can interfere with oral function and quality of life, and can reduce the need for more intensive immunosuppressive systemic therapies.

Topic: Clinical Research: Periodontal Therapy

**P0812**

### EVALUATION OF DIODE LASER APPLICATION AND ARGININE BICARBONATE-CALCIUM CARBONATE COMBINATION IN THE TREATMENT OF DENTINE HYPERSENSITIVITY

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<sup>1</sup>Ankara/Turkey, <sup>2</sup>Gaziantep/Turkey

**Aim:** Dentin hypersensitivity is an uncomfortable condition that affects function and quality of life. The aim of this clinical study was to evaluate and compare the effectiveness of diode laser, arginine bicarbonate-calcium carbonate combination on dentin hypersensitivity.

**Material and Methods:** A total of 21 patients (16 female and 5 male, aged 19 to 60 years) with dentin hypersensitivity were included and randomly allocated to application of arginine bicarbonate-calcium carbonate combination (ABCC), diode laser (685 nm wavelength, 1,5-2,5 mW) (DL), distilled water for placebo. The assessment of pain was performed by a visual analog scale (VAS) after an air stimulus at baseline, immediately after treatment, and at patient visits on ten days, 1, 2 and 3 month

**Results:** Dentin hypersensitivity showed reduction at DL and ABCC groups immediately, ten days, one, two, three month for air stimulus. Test group were determined to be significantly better in reducing the VAS score compared to the placebo group ( $p < 0,05$ ).

**Conclusion:** It may be concluded that both DL and ABCC were effective in the treatment of dentin hypersensitivity.

Topic: Clinical Research: Periodontal Therapy

**P0813**

### The effect of oral health promotion in patients with fixed orthodontic appliance. A 12-month follow-up study

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Bergen/Norway

**Aim:** Many patients experience an increased incidence of gingivitis during fixed orthodontic treatment. The aim of this study was to evaluate the effect of extra professional oral hygiene instruction during a 12-month orthodontic treatment period.

**Material and Methods:** The participants in this prospective, clinical study were referred patients from public health service in Sunnhordland. Included patients were randomly allocated to a test (16) or a control group (14). The test group received oral hygiene instruction and cleaning at baseline and 1, 3, 6, 9, and 12 months, whereas the control group received the same treatment only at baseline and 12 months. In addition to microbial sampling, the following clinical variables were recorded: Probing depth, bleeding on probing, dental plaque, and the distance from the gingival edge of the bracket to the gingival margin.

**Results:** Generally, this study showed a similar worsening of the periodontal conditions for both groups during the 12-month treatment period. Fixed orthodontic treatment resulted in increased bleeding on probing for the test ( $P=0.04$ ), increased numbers of probing depths  $\geq 3$  mm, and reduced distance from

brackets to gingival margin for both groups ( $P<0.001$ ). The number of patients positive for *P. gingivalis* increased during the 12-month observation period for both groups. However, the increase was only significant for the control group ( $P=0.02$ ).

**Conclusion:** This study shows that fixed orthodontic treatment may have detrimental effects on the periodontal conditions among 12-year old children even after extra professional oral hygiene instruction. Additional oral health promotion did not result in periodontal improvement for this group of patients.

Topic: Clinical Research: Periodontal Therapy

## P0814

### Root Coverage with Connective Tissue Grafts on Teeth With or Without Cervical Fillings and Comparisons of Glass-ionomer and Nano-ionomer Fillings

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Ankara/Turkey

**Aim:** The aim of this study was to compare the root coverage and esthetic results of connective tissue grafts (CTG) performed on teeth presented gingival recessions and non-carious cervical lesions which were restored with resin-modified glass ionomer (RMGI) or nano-ionomer (NI) fillings, with those grafts which were performed on teeth with only gingival recession and no cervical lesion.

**Material and Methods:** Twenty-five subjects having gingival recessions (Miller-I-II) associated with non-carious cervical lesions (test) and fourteen subjects having gingival recessions (Miller-I-II) with no cervical lesions (control) were selected. Cervical lesions were treated randomly with RMGI or NI restorations. Probing depth, clinical attachment level, gingival index, plaque index, dentin sensitivity, gingival recession height (GRH), gingival recession width (GRW), keratinized tissue width were measured at baseline, 10 days and 1, 3 and 6 months postoperatively. Esthetic scores were also evaluated.

**Results:** At 1, 3 and 6 months statistically significant differences were found between RMGI and control groups for GRH and GRW. No statistically significant difference was detected between RMGI and NI groups during the study period. The percentages of the root coverage were 86.53%, 87.33% and 100% in RMGI, NI and control groups, respectively. Esthetic scores were similar in the groups at 6 months.

**Conclusion:** Gingival recessions associated with cervical lesions may be successfully treated by an integrated periodontal and restorative dentistry approach. Connective tissue grafts favorably attached on cervical fillings. However, root coverage was less obtained on teeth with cervical fillings compared to those without. The root coverage results were better on NI fillings than RMGI fillings.

Topic: Clinical Research: Periodontal Therapy

## P0815

### Activity of Platelet Activating Factor Acetylhydrolase. Following Phase I Periodontal Therapy

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Samsun/Turkey

**Aim:** Elevated levels of platelet activating factor (PAF), a potent inflammatory mediator, in periodontal disease and decreased PAF levels following periodontal surgical therapy have been previously detected in gingival tissues and gingival crevicular fluid (GCF). Platelet activating factor acetylhydrolase (PAF-AH) is a calcium-independent phospholipase A2 that catalyzes the hydrolysis of PAF, thereby inactivates this mediator. The hypothesis, a relationship between activity of PAF-AH and healing following periodontal therapy, was tested by detecting activity of PAF-AH in GCF samples collected from sites that had undergone phase I periodontal therapy with generalized chronic periodontitis.

**Material and Methods:** Twenty generalized chronic periodontitis patients were divided into 2 groups (n:10); group1 with probing pocket depth (PPD) 4-5mm, group2 with PPD  $\geq 6$ -8mm. Clinical parameters were recorded and GCF was sampled before phase I periodontal therapy and at 2-, 7-, 14-, 21, and 28th day follow-up evaluation visits. Activity of PAF-AH in GCF was analyzed by ELISA.

**Results:** PPD at 21- and 28th day in group1, and PPD at 14-, 21-, and 28th day in group2 were significantly decreased compared to the baseline values ( $P<0.001$ ). Activity of PAF-AH ( $\mu\text{mol/ml}$ ) was significantly decreased at 7-, 14-, 21-, and 28th day following phase I periodontal therapy in both group1 and group2 compared to the baseline values ( $P<0.05$ ).

**Conclusion:** PAF-AH is detectable in GCF by ELISA and showed a continuous decrease following phase I periodontal therapy. Changes in the PAF-AH activity would be a progressive marker of periodontal healing to evaluate the success of periodontal therapies.

Topic: Clinical Research: Periodontal Therapy

## P0816

### Types of splinting used in single rooted teeth- a comparative study

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Cluj-Napoca/Romania

**Aim:** To compare the effects of various types of splinting of single rooted teeth affected by severe chronic periodontitis.

**Material and Methods:** The study was made on 150 teeth from 16 patients with severe chronic periodontitis. Teeth splinting was done using three methods: acrylicfixed partial dentures, composite splints reinforced with fiberglass and brackets. According to the splinting technique the patients were divided in three groups, every group having the same number of teeth (50). Clinical examination included hygiene index, gingival bleeding index, periodontal probing depth and clinical attachment level. For each tooth the inflammation I1 and the loss of attachment PA1 were measured. The same measurements were registered after two months and were noted as I2 and PA2. Initially every group was analyzed following their average values, then were made correlations between the values and in the end the three groups were compared.

**Results:** The study revealed a correlation between the clinical attachment level and the inflammation stage, both before and after treatment

**Conclusion:** : Splinting systems have an important role in maintaining the position of teeth with pathologic mobility. The effects of teeth immobilization are immediate: functional,

esthetic and psychological. After being splinted, at the level of the affected periodontium can be noticed a better healing process, less local inflammation and reattachment of the epithelial junction. For the three groups of study it was observed an improvement of epithelial reattachment with an average of 0,9-1,03 mm.

Topic: Clinical Research: Periodontal Therapy

**P0817**

### Evaluation of an In-office Desensitizing Paste and Er:YAG Laser in Hypersensitivity Treatment: A Randomized Clinical Trial

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Istanbul/Turkey

**Aim:** The aim was to evaluate the effectiveness of a desensitizing paste containing 8% arginine and calcium carbonate compared to Er:YAG laser in dentine hypersensitivity.

**Material and Methods:** Thirty patients presenting hypersensitivity in at least 2 teeth were randomly assigned into one of the 2 treatment groups. Patients were treated with desensitizing paste containing 8% arginine and calcium carbonate in the Group I (n=15) and with Er:YAG laser (80mJ, 2Hz, without water/air spray) in the Group II (n=15). Hypersensitivity was measured using Visual Analogue Scale (VAS) for the tactile stimuli before and immediately after the treatment applications. Moreover, the measurements were repeated after 7, 30 and 90 days.

**Results:** The mean VAS scores of the groups were similar at baseline. Immediate alleviation effect was significantly higher in the Group I than the Group II. The differences between the VAS scores at baseline and at all measurement time points after the treatments were found significant within each group. At the end of 90 days, VAS scores in both groups were not significantly different from each other, but still revealed significantly lower values compared to baseline.

**Conclusion:** In conclusion both applications were effective in alleviating the hypersensitivity up to 3 months follow-up period. However, the in-office desensitizing paste containing 8% arginine and calcium carbonate demonstrated superior immediate effect compared to Er:YAG laser.

Topic: Clinical Research: Periodontal Therapy

**P0818**

### Effects of Scaling, Root Planning and Dietary Supplementation of Omega-3 Fatty Acids on Gingival Crevicular Fluid Levels of PGE2, LTB4, MMP-8 in Patients with Chronic Periodontitis

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**Aim:** Recently, several studies have evaluated the beneficial effects of Omega-3 polyunsaturated fatty acids on diverse physiological processes in the body and on a variety of chronic inflammatory diseases, including periodontal diseases. In this study, we evaluated the effect of omega 3 fatty acids in conjunction with scaling

and root planning (SRP) on gingival crevicular fluid (GCF) levels of PGE2, LTB4, and MMP-8 in patients with chronic periodontitis.

**Material and Methods:** Thirty healthy subjects (fifteen in each group) with chronic periodontitis were enrolled in the study. They were randomly allocated into two groups. The control group was treated with SRP whereas the omega group was treated with SRP followed by dietary supplementation of low-dose omega. GCF samples were obtained from all patients for evaluation of PGE2, LTB4, and MMP-8. GCF samples and clinical parameters were taken at baseline, 1, 3 and 6 months following therapy.

**Results:** GCF MMP-8 levels showed significant reductions in the omega-3 group in response to treatment compared to the control group at 1 and 3 months (p=0.001). Clinical scores and other biochemical parameters tended to be lower in the test group; at 3 and 6 months, however, there was no statistically significant difference between the two groups at different time intervals.

**Conclusion:** The results of this clinical study suggest that supplementation of the diet with omega-3 daily may have no prominent benefit after SRP in the treatment of chronic periodontitis. There is a need to establish dose-dependent effects of omega 3 in larger population groups.

Topic: Clinical Research: Periodontal Therapy

**P0819**

### Clinical and microbiological findings of dental implants in patients with the history of chronic periodontitis

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**Aim:** The aim was to evaluate the clinical and microbiological findings of dental implants and neighboring teeth in patients treated for chronic periodontitis (CP) compared to in periodontally healthy (PH) subjects.

**Material and Methods:** A total of 25 patients were included in the study. Twelve of them were treated for CP and 13 were periodontally healthy. Periodontal examination and subgingival microbial sampling were carried out at baseline for the neighboring teeth and 10, 40, 90, 180 days after the implant surgery (Astra Tech-Osseospeed™) for both implants and the neighboring teeth. Plaque samples were cultured for detecting the microbial load whereas PCR was performed for detection of *Porphyromonas gingivalis*.

**Results:** The mean values for all clinical parameters were within healthy limits throughout the study in both groups. Although the differences were not significant, the obligately anaerobic microorganisms were found in higher proportions around implants and neighbouring teeth of CP subjects compared to PH and the proportions increased over time in CP subjects. Only in 3 CP patients sampled neighboring teeth harboured *P.gingivalis* at baseline and at least 2 of the following sampling periods. Similarly, in these patients *P.gingivalis* was also detected around the implants at least one of the sampling times.

**Conclusion:** As long as the patients were treated for CP, the microbial load and the persistent colonization of *P.gingivalis* did not affect the healthy clinical status of the implants. However, owing to the fact that *P.gingivalis* is a risk factor for future development of periodontal and periimplant diseases, the patients should be kept under strict supportive maintenance care.

## Topic: Clinical Research: Periodontal Therapy

**P0820****Treatment of intrabony defects with Ostim® or Emdogain®**

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*Dresden/Germany*

**Aim:** Comparison of the clinical outcomes after regenerative periodontal surgery using either an enamel matrix derivative (Emdogain®) or a synthetic bone graft (Ostim®) in wide intrabony defects 12 months after treatment.

**Material and Methods:** Thirty-six patients with chronic periodontitis were recruited. All patients showed intrabony defects of at least 4 mm depth and 2 mm width. Using a microsurgical technique a modified papilla preservation flap was prepared. After debridement, patients were randomly assigned to Emdogain group (test) or Ostim group (control). Assessments at baseline, 6 and after 12 months included bone sounding, attachment level, probing pocket depth, bleeding on probing, and recession.

**Results:** Both treatment modalities led to significant clinical improvements. No significant differences between both groups were recorded. Change in bone fill 12 months after surgery was 1.6 mm ( $\pm 1.2$ ) in the test group and 1.6 mm ( $\pm 1.3$ ) in the control group, respectively. A gain in clinical attachment of 1.4 mm ( $\pm 1.8$ ) in the test group and 2.1 mm ( $\pm 1.6$ ) in the control group was observed. A reduction in probing pocket depth of 2.6 mm ( $\pm 1.8$ ) in the test group and 3.2 mm ( $\pm 1.8$ ) in the control group was recorded. Two weeks after surgery primary closure was maintained in 100% of both the test and control groups. No differences in patients' perceptions were found.

**Conclusion:** The results show comparable clinical outcomes following both treatment modalities 12 months after treatment. Further investigation is needed to identify factors influencing individual responses.

## Topic: Clinical Research: Periodontal Therapy

**P0821****Treatment of Gingival Recessions- Literature Review**

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*Porto/Portugal*

**Aim:** Compare two approaches on the gingival recession treatment: connective tissue graft (CTG) with coronal advanced flap (CAF) and CTG with CAF and enamel matrix proteins (EMP).

**Material and Methods:** We made a bibliographic research using Pubmed Database and the following keywords: "coronal advanced flap", "connective tissue graft", "gingival recession", "enamel matrix proteins". The limits were: meta-analyses, randomized controlled trial and clinical trials published in the last 5 years.

**Results:** 53 articles were found by key-words. Of these, after read the abstracts were selected 10 that fit the inclusion criteria previously defined.

**Conclusion:** The results of the papers revised confirm that both techniques have the same results referring to root coverage and

gain of queratinized tissue. The main difference seems to occur in the histological point of view, with better results to the EMP. The results of different studies indicate that the association of EMP is beneficial in augmentation effects of CAF with CTG in relation to amount of root coverage, reducing the probing depth and gain of clinical attachment.

## Topic: Clinical Research: Periodontal Therapy

**P0822****The Effect of Chlorhexidine Mouthrinse on Tooth Discoloration.**

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**Aim:** Tooth discoloration is a known side effect of mouthrinses. However, severity and extent of discoloration vary among patients. It was the aim of the study to determine after how many rinses visible discoloration occurs.

**Material and Methods:** For this clinical study, 16 healthy dental students were recruited. At baseline, they received a dental prophylaxis. Then the color of the cervical vestibular areas of twelve intact anterior teeth was measured by means of a spectrophotometer (Vita Easyshade, Vita, Germany). For color classification the CIELAB system was used. In the following 8 days, the participants rinsed at home for 30s with 10ml chlorhexidine mouthrinse (CHX; 0.12%) twice daily. Immediately after the CHX rinse they rinsed with black tea for one minute. Tooth brushing was not permitted. The subjects returned to the study site every day to record the parameters. At the end of the study, all participants received a dental prophylaxis. For each day the metric distance of color measurements  $\Delta E$  compared to baseline was calculated.

**Results:** After two rinses, a mean  $\Delta E$  value of  $2.9 \pm 0.8$  was calculated. Values higher than 2.0 represent a perceived color difference.

**Conclusion:** The combination of CHX and black tea rinsings leads to visible discoloration of teeth. Therefore, the intake of coloring drinks and food immediately after CHX rinsing should be avoided in order to prevent early discoloration.

## Topic: Clinical Research: Periodontal Therapy

**P0823****A randomized clinical trial to compare i-piezon versus conventional ultrasonic piezo scaler regarding pain using a visual analog scale**

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*Ankara/Turkey*

**Aim:** Mechanical debridement is a critical component of periodontal therapy and successfully carried out by conventional ultrasonic piezo scalers. But patients were given various degrees of sensitivity during this treatment. Mechanical debridement usually performed without anesthesia and this procedure uncomfortable for the patients. The aim of this study was to compare the patient's perception of the impact of conventional



ultrasonic piezo scalers with a new piezo-driven ultrasonic (i-piezon scaler) device on pain and comfort.

**Material and Methods:** The study was carried out with 45 patients who had dental plaque-induced gingivitis. Using a randomised split-mouth design, in each patient two quadrant treated conventional ultrasonic piezo scaler and the other quadrants treated with i-piezon scaler. Subjects were asked to express their perceived intensity of pain and their overall satisfaction on a Visual Analog Scale (VAS). The VAS scores were analysed with Wilcoxon signed rank test.

**Results:** Using VAS scores, the patients perceived significantly less pain with i-piezon scaler, than the conventional ultrasonic piezo scaler ( $p < 0.05$ ).

**Conclusion:** Patients preferred the i-piezon scaler to conventional ultrasonic piezo scaler for being less painful system. Increasing patient comfort at periodontal treatment plays a key role that may lead patients to continue maintenance therapy.

Topic: Clinical Research: Periodontal Therapy

**P0824**

### Antimicrobial Peptide (AMP) Gene Expression in Epithelial Cells Following Stimulation with Antimicrobial Mouth Rinses

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<sup>1</sup>Berlin/Germany, <sup>2</sup>Krems-Stein/Austria

**Aim:** The present study investigates effects of antimicrobial mouth rinses on the gene expression of AMPs and proinflammatory cytokines in human keratinocytes.

**Material and Methods:** HaCaT cells were cultured in six-well plates (1×10<sup>6</sup>/well), pretreated with starvation medium (0.5% Fetal Bovine Serum) for 12 hours and stimulated with or without (negative control) 0.12%, 0.2% and 2% chlorhexidine digluconate, 0.3% and 3% hydrogen peroxide and Meridol mouth rinse for 2, 5, 15 and 30 minutes. 50 ng/mL TNF- $\alpha$  was used as positive control. Total RNA was assessed for hBD-1, -2, IL-1 $\beta$ , LL-37, TNF- $\alpha$  and GAPDH-mRNA by Real-Time Reverse Transcriptase-Polymerase Chain Reaction.

**Results:** A statistically significant up-regulation of hBD-1 gene expression was observed with 3% hydrogen peroxide ( $p \leq 0.05$ ) and Meridol mouth rinse ( $p \leq 0.01$ ) following stimulation of HaCaT for 2 min. Also, a significant hBD-1 up-regulation was seen following incubation for 5 min with 0.12% chlorhexidine digluconate ( $p \leq 0.01$ ) as well as 0.3% ( $p \leq 0.05$ ) and 3% ( $p \leq 0.01$ ) hydrogen peroxide. Moreover the expression of hBD-2 was significantly increased following stimulation of HaCaT cells with 3% hydrogen peroxide for 2 min ( $p \leq 0.05$ ) and with 2% chlorhexidine digluconate for 15 min ( $p \leq 0.05$ ). Furthermore, the expression of IL-1 $\beta$  was significantly elevated following stimulation with 0.3% ( $p \leq 0.05$ ) and 3% ( $p \leq 0.01$ ) hydrogen peroxide for 5 min. The expression of LL-37 and TNF- $\alpha$  was not altered by applied mouth rinses.

**Conclusion:** Mouth rinses affect time-dependently the expression of hBD-1, hBD-2 and IL-1 $\beta$  in human keratinocytes, which could partly explain their beneficial effect on periodontal health.

Topic: Clinical Research: Periodontal Therapy

**P0825**

### Effect of locally delivered 3% peroxide hydrogen gel (ASD) to non surgical periodontal therapy

S.D. Aspriello

Ancona/Italy

**Aim:** Dentifrice or mouthrinse containing H<sub>2</sub>O<sub>2</sub> inhibited plaque and decreased gingivitis. In the present study we compared healing response after non surgical periodontal therapy following adjunctive use of daily locally delivered 3% peroxide hydrogen gel (ASDgel) for a week.

**Material and Methods:** One hundred patients, each having at least eight periodontal sites with PPD (probing pocket depth)  $>$  or  $=$  5 mm, were randomly assigned to two different treatment protocols; non-surgical scaling/root planing combined with ultrasonic instrumentation (control) and non-surgical scaling/root planing combined with ultrasonic instrumentation + daily application for a week of 3% peroxide hydrogen gel (ASD) (Test). Instructions in oral hygiene were given to all patients. Clinical examinations of plaque, PPD, clinical attachment level (CAL) and bleeding following pocket probing were performed at baseline and after 2 months. Primary efficacy endpoints were changes in PPD and CAL. Patient mean values were calculated as basis for statistical analysis.

**Results:** The baseline examination revealed no significant difference in mean PPD between treatment groups (mean PPD 5.6-5.8 mm). The mean PPD reduction in the control group at 2-month was 0.5 mm (SD=0.41) the mean CAL gain amounted to 0.3mm(0.71). In the test group the PPD reduction was 1.5 mm (0.60) and the mean CAL gain amounted to 0.8 mm (0.64). Differences between the groups regarding gingival index, bleeding on probing and plaque index were found after 2 month ( $p > 0.05$ ).

**Conclusion:** Daily locally applied 3% peroxide hydrogen gel (ASD) for a week after non-surgical periodontal therapy may partly increase periodontal healing in periodontitis patients.

Topic: Clinical Research: Periodontal Therapy

**P0826**

### Periodontal recessions and aesthetic perception of smile harmony: role of distance and clinical experience of the observer.

M. Monteverchi, F.P. Desimini, C.M. Paci, M. Ugolini, M.R. Gatto, L. Checchi

Bologna/Italy

**Aim:** To determine how distance and clinical experience of the observer influence aesthetic perception with respect to variations in anterior soft tissues alterations.

**Material and Methods:** 73 dental students at the University of Bologna, 33 first-year students (preclinical) and 40 fifth-year students (clinical) were recruited for the study. The participants in the study were requested to assign scores to four randomly assigned images of eleven simulated clinical cases of gingival recessions: thirty seconds of observation per photo using Visual Analogue Scale. The observations

were performed at pre-defined psychosocial interpersonal distances: 45 cm (limit between "Intimate Space" and "Consultative Space") and 120 cm (limit between "Consultative Space" and "Social Space"). After two evaluations some minutes passed to reset short-term memory. A total of 292 observations were taken. Statistical analysis A GLM and Scheffé test were applied ( $\alpha$ -level was set at 0.05).

**Results:** No significance influence of experience ( $p=0.07$ ) and distance ( $p=0.89$ ) on the aesthetic perception with respect to variations in anterior soft tissues alterations was observed. The periodontal alterations significantly influence the scores ( $p=0.025$ ) and the photo with a single 4mm recession on a canine had the lowest scores. Middle and high evaluations prevailed (low: 0-2, middle: 3-7, high: 8-10;  $\chi^2=35.77$ ,  $p=0.02$ ).

**Conclusion:** Results evidence that distance and clinical experience do not influence aesthetic perception. Asymmetrical recessions, in both groups, negatively influence smile's score. Except for important asymmetries the periodontal recession does not seem to influence the smile aesthetic.

## Topic: Clinical Research: Periodontal Therapy

### P0827

#### Biofilm Removal of Ultrasonic Driven Devices with Universal and Periodontal Instrument Tips

P. Schmage<sup>1</sup>, B. Blochberger<sup>1</sup>, I. Nergiz<sup>1</sup>, U. Platzer<sup>1</sup>, P. Pfeiffer<sup>2</sup>

<sup>1</sup>Hamburg/Germany, <sup>2</sup>Cologne/Germany

**Aim:** This in vitro-study aimed to investigate the cleaning effectiveness of ultrasonic driven devices with universal and periodontal instrument tips on molar roots.

**Material and Methods:** The root surfaces of extracted molars with simulated periodontal pockets were cleaned from artificial biofilm using 19 combinations ( $n=5$ ) of ultrasonic devices (MiniMaster, PiezonMaster400, PM700, CavitronJet, SYmmetric, PerioScan, Varios, P-Max) with 10 universal (EMS-PS, HuFriedy-UE100, -US100, SDM-P1, WoodPecker-P3, AmericanEagle-ITPS, FSI10S, Sirona-PE1, NSK-P20, Acteon-10Z) and 4 periodontal (EMS-PL1/2, FSI10R/L, HuFriedy-US4L/R, Sirona-PE2/3) instruments respectively within 5 min. Manual curettes (CU) were used for control. The cleaned approximal (AP) and buccal/oral (BO) areas were assessed computer assisted. Statistical analysis was carried out (one-way ANOVA, Bonferroni/Dunn correction,  $t$ -test,  $\alpha=0.05$ ).

**Results:** Best biofilm cleaning effectiveness was found for PM700, CJ and SY with all tested tips (PM700-PS, PL, UE 99±1%/ CJ-FSIS, FSIRL 98±2%/ SY-US 98±2% and USLR 96±4%). These groups differed significantly from CU, MM/PS, PM400 with UE, WP, AE and VA/P20 for AP and from CU, PM400 with UE, AE and VA/P20 for BO ( $p<0.0003$ ). Generally, all ultrasonic instruments cleaned better or at least as efficient as CU (85±7%). This was significant for all periodontal instruments and for PM700 with PS, UE, for CJ/FSIS and SY/US regardless of the tooth sites ( $p<0.0003$ ). Lowest efficiency was found for PM400/AE and VA/P20 being not significantly different from CU. No combination showed significant differences between tooth sites ( $p>0.05$ ).

**Conclusion:** The ultrasonic driven systems performed beneficially regarding biofilm removal. The device seemed to have a greater influence on the efficiency than the various instruments. Yet, curved periodontal instruments should be favoured in deep pockets.

## Topic: Clinical Research: Periodontal Therapy

### P0828

#### Minimally invasive periodontal surgery with diamond ultrasonic root instrumentation (sonicline - sonictips Komet Italia).

S.D. Aspriello, M. Piemontese

Ancona/Italy

**Aim:** The aim of this study was to compare the clinical and radiographic efficacy of the modified minimally invasive surgical technique (M-MIST) with diamond ultrasonic or rotating root instrumentation for the treatment of intra-bony defects.

**Material and Methods:** 26 deep intra-bony defects in 26 patients were accessed with the M-MIST with the aid of an operating microscope and microsurgical instruments. The M-MIST consisted of a small buccal flap without elevation of the defect-associated papilla. After removal of the granulation tissue by sharp dissection, the defects were randomly assigned to diamond ultrasonic (Sonicline - sonictips Komet Italia) or rotating root instrumentation. A primary wound closure was obtained for all sites. Outcomes were evaluated as pocket depth reduction, attachment level gain, radiographic bone fill and patient-related outcomes.

**Results:** Clinical attachment level gains of 3.3±1.9mm were observed in the M-MIST ultrasonic treated group, 2.1±1.2mm in the M-MIST rotating treated group, probing pocket depth reduction was 3.8±1.7mm and 5.1±1.3mm, respectively, and the percentage radiographic bone fill of the intra-bony component was 67±17% and 49±23%, respectively.

**Conclusion:** M-MIST in combination with diamond ultrasonic (sonicline - sonictips Komet Italia) root instrumentation resulted in significant clinical and radiographic improvements and may represent a suitable option to surgically treat defects in areas with high esthetic demands.

## Topic: Clinical Research: Periodontal Therapy

### P0829

#### Efficacy of tea tree oil against Porphyromonas gingivalis

W.L. Pfister<sup>1</sup>, S. Eick<sup>2</sup>

<sup>1</sup>Jena/Germany, <sup>2</sup>Bern/Switzerland

**Aim:** Tea tree oil (TTO) has been proven for treatment of wounds and inflammation. The purpose of our in vitro study was to determine the antimicrobial activity of TTO on Porphyromonas gingivalis (P.g.) in planktonic growth, in biofilms as well as in contact with epithelial cells.

**Material and Methods:** The minimal inhibitory concentration of tea tree oil (TTO) against 21 P.g. strains was determined by using agar-dilution technique. Further, 0.01% and 0.1% of TTO were tested against four P.g. strains within a biofilm as well as in contact with KB-cells, an epithelial cell line.

**Results:** The MIC of TTO against 18 of the 21 P.g. strains (86%) was  $\leq 0.05\%$ . Pretreatment of a surface with 0.1%

TTO inhibited significantly the formation of P.g. biofilms after 6 h. No effect was found 24 h after starting biofilm formation. In addition, there was no antimicrobial efficacy of TTO against a 48 h-old biofilm. Addition of TTO to P.g. in contact with KB-cells clearly reduced the numbers of attached P.g. cells. Only one of the four tested P.g. strains was still detectable after applying 0.1% TTO. Further, TTO decreased the release of IL-8 by 47% from non infected KB-cells, whereas after infection with P.g. increased concentration dependant levels of IL-8 were measured suggesting an inhibiting effect of TTO on gingipains activity of P.g.

**Conclusion:** Conclusion: TTO as an additive to oral health care products may inhibit colonization with P.g.

## Topic: Clinical Research: Periodontal Therapy

### P0830

#### Systemic enzyme therapy in treatment of generalized chronic periodontitis

E.V. Gerasimova, L.A. Dmitrieva, V.G. Atrushkevich  
Moscow/Russian Federation

**Aim:** Ones of the most questions in periodontology are improvement of treatment efficacy of Generalized Chronic Periodontitis (GCP) and searching for innovative medications that would enhance treatment results. That's why we chose a medication for systemic enzyme therapy (SET) – Phlogenzym – with anti-inflammatory, immunomodulating and other required characteristics.

**Material and Methods:** In this study there were treated 36 patients of both genders from 39 to 64 y.o. with GCP, without heavy somatic pathology. The patients were split in two groups. The main group followed traditional therapy in combination with Phlogenzym during 14 days (2 tablets/ 3 times a day). Control group were treated only by traditional therapy. We did clinical examination with periodontal indexes, measured periodontal pockets, made an ortho-pantomography, took oral fluid samples to define interleukin levels (TNF- $\alpha$ , IL-1, receptors to IL-2, IL-6, IL-8, IL-10). Interleukin level in oral fluid was determined by enzyme immunoassay. Results were processed with StatPlus software.

**Results:** Gingival tissue condition improved significantly on the 14th day of treatment in main group patients. TNF- $\alpha$  level was  $31,38 \pm 5,14$  pg/ml, in comparison with Control ( $59,71 \pm 7,31$  pg/ml) ( $p=0,0006$ ). IL-1 reached the level of  $665,63 \pm 125,44$  pg/ml, that was statistically significantly better than in Control group ( $934,63 \pm 65,38$  pg/ml) ( $p=0,009$ ); level of IL-2 was  $51,95 \pm 1,95$  U/ml whereas in Control group ( $61,06 \pm 5,6$  U/ml) ( $p=0,03$ ); IL-10 measurements were  $11,59 \pm 3,16$  pg/ml, that was statistically significantly better than in Control group ( $19,71 \pm 4,71$  pg/ml) ( $p=0,04$ ). Levels of IL-6 and IL-8 did not significantly differ ( $p \geq 0,05$ ).

**Conclusion:** Phlogenzym medication in combination therapy of CGP improves the results of traditional treatment.

## Topic: Clinical Research: Periodontal Therapy

### P0831

#### Residual periopathogens after access flap and two different antibiotic-therapies: 1 year clinical results

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<sup>1</sup>Bonn/Germany, <sup>2</sup>Aachen/Germany

**Aim:** The present retrospective study examined associations between presence of periodontopathogenic bacteria and clinical outcomes 1 year after surgery.

**Material and Methods:** 56 patients with periodontitis (27 women; mean age:  $53 \pm 8.5$ ) received flap-surgery in combination with antibiotics after oral hygiene-instructions and subgingival scaling/rootplaning. The prescription of Amoxicilline/Metronidazole (AM-group;  $n=27$ ) or alternative antibiotics (AB-group;  $n=29$ ) based on microbiological testing. All patients were clinically monitored at baseline, before and up to 1 year after surgery. Before and 3 months after surgery subgingival plaquesamples were harvested and evaluated with a PCR-based test (micro-Ident<sup>®</sup>Test, Hain Lifescience GmbH, Germany) for detection of *Aggregatibacter actinomycetemcomitans* (Aa), *Porphyromonas gingivalis* (Pg), *Prevotella intermedia* (Pi), *Tannerella forsythia* (Tf) and *Treponema denticola* (Td). Relative amounts of residual pockets  $\geq 4$ mm (RP $\geq 4$ mm) resp.  $\geq 5$ mm (RP $\geq 5$ mm) as well as bleeding on probing (BOP) were correlated with microbiological findings.

**Results:** Differences from baseline to 1 year showed a significant decrease in both groups ( $p < 0.000$ ): RP $\geq 4$ mm (AM-group:  $42\% (\pm 22)$ ; AB-group:  $33\% (\pm 24)$ ), RP $\geq 5$ mm (AM-group:  $26\% (\pm 13)$ ; AB-group:  $17\% (\pm 18)$ ) and BOP (AM-group:  $69\% (\pm 29)$ ; AB-group:  $46\% (\pm 34)$ ); between groups there was no significant difference ( $p > 0.184$ ). Frequency of detection of bacteria was decreased. Significant correlations were found between the amount of RP $\geq 4$ mm after 1 year and presence of Pg, Pi and Td after 3 months ( $p < 0.05$ ) as well as the amount of RP $\geq 5$ mm after 1 year and Pg, Pi, Tf and Td after 3 months ( $p < 0.03$ ) in the AB-group. In the AM-group correlations between RP $\geq 4$ mm resp. RP $\geq 5$ mm after 1 year and Td were found ( $p < 0.005$ ). For BOP no correlations could be noticed.

**Conclusion:** Residual bacteria after flap surgery/antibiotics could be correlated with less favourable results.

## Topic: Clinical Research: Periodontal Therapy

### P0832

#### SYSTEMIC ENZYME THERAPY IN TREATMENT OF GENERALIZED CHRONIC PERIODONTITIS

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Moscow/Russian Federation

**Aim:** Ones of the most acute questions in periodontology are improvement of treatment efficacy of Generalized Chronic Periodontitis (GCP) and searching for innovative methods and medications that would enhance treatment results. That's why we chose a medication for systemic enzyme therapy (SET) – Phlogenzym – with anti-inflammatory, immunomodulating and other required characteristics.

**Material and Methods:** In this study there were treated 36 patients



of both genders from 39 to 64 y.o. with GCP, without heavy somatic pathology. The patients were split in two groups. The main group followed traditional therapy in combination with Phlogenzym during 14 days (2 tablets/3 times a day). Control group were treated only by traditional therapy. We did clinical examination with periodontal indexes, measured periodontal pockets, made an orthopantomography, took oral fluid samples to define interleukin levels (TNF- $\alpha$ , IL-1, receptors to IL-2, IL-6, IL-8, IL-10). Interleukin level in oral fluid was determined by enzyme immunoassay. Results were processed with StatPlus software.

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**Conclusion:** Phlogenzym medication in combination therapy of CGP improves the results of traditional treatment.

## Topic: Clinical Research: Periodontal Therapy

### P0833

#### In-vitro reproducibility of selected periodontal probes

K.N. Al Shayeb, D. Gillam, W. Turner, S. Islam

London/United Kingdom

**Aim:** Previously several Investigators (Hunter et al. 1994, Gillam et al. 1998, Patel et al. 1998) reported that a Vivacare TPS probe provided more accurate and consistent probing pressure for use in periodontal measurement. Recently an UB-CF-15 Periodontal probe has been introduced into the UK for periodontal monitoring.

The aim of the study was to measure the accuracy and reproducibility of both experienced and inexperienced examiners using an UB-CF-15 Periodontal probe (Implantium, Shrewsbury, UK) compared to Williams 14W (Dentsply Ltd, Addlestone, UK) and Vivacare TPS probes (Ivoclar Vivadent AG, Liechtenstein).

**Material and Methods:** 33 dentists were asked to probe selected anterior and posterior sites on a model over 15 minutes by using three periodontal probes (William 14W, UB-CF-15, and Vivacare TPS) on a digital electronic balance. Probing pressure measurements were recorded over 15 minutes. The participants' probe preferences were also recorded following the probing exercise. Intra- and inter-examiner accuracy (with regard to 25gm pressure) and reproducibility for each of the duplicate measurements were calculated and analysed using SPSS 18 software (IBM Portsmouth, UK).

**Results:** The ranking of the accuracy and reproducibility of the three probes was as follows; TPS, UB-CF-15, Williams. Probing pressures were lighter in the anterior region compared to posterior region at baseline however probing pressures were reduced at both sites after 15 minutes.

**Conclusion:** The results appeared to confirm previous results that the TPS probe was more reproducible and accurate than the other probes however most participants preferred the UB-CF-15 (55%) compared to William (36.4%) and TPS (9%) probes.

## Topic: Clinical Research: Periodontal Therapy

### P0834

#### Effect of Intermitent Administration PTH (1-34) on periodontitis in rats exposed to cigarette smoking inhalation

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<sup>1</sup>Campina Grande - Paraíba/Brazil, <sup>2</sup>1921065200/Brazil

**Aim:** The aim of the present investigation was to histologically and histoquimically evaluate, in an animal model (rats), the influence of cigarette smoke inhalation (CSI) and intermittent administration of PTH in rodents would block the alveolar bone loss when a ligature-induced periodontitis is used.

**Material and Methods:** Animals were randomly assigned in groups: 1 – placebo (vehicle) Control-ligated (n=11); 2 – CSI + placebo-ligated (n=15); 3 – PTH-treated ligated (n=10); 4 – CSI + PTH-treated ligated (n=15). Contralateral teeth were unligated to serve as controls. After 60 days with ligatures, the animals were killed. The histometric evaluate determined the area between the bone crest and cementum surface in the furcation regions of teeth and the number of cells positive for tartrate-resistant acid phosphatase (TRAP). The data were statistically analysed using ANOVA and Tukey's test ( $\alpha=5\%$ ).

**Results:** At the ligated sites, intergroup analysis revealed significantly increased the bone loss resulting from ligature-induced periodontitis when group 2 compared with group 1, 3 and 4, respectively ( $P<0,05$ ). The number of TRAP-Positive cell in the linear surface of the bone crest showed an increase for the group 2 compared with the group 1, 3 and 4, respectively ( $P<0,05$ ).

**Conclusion:** Whithin the limits of the present study, it can be concluded that PTH in the absence or presence of CSI may be minimize significantly the bone resorption associated with periodontitis.

## Topic: Clinical Research: Periodontal Therapy

### P0835

#### In vitro Evaluation of the Effects of Different Treatment Procedures on Dentine Tubules

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<sup>1</sup>Istanbul/Turkey, <sup>2</sup>Istanbul/Turkey

**Aim:** The objective of this study was to evaluate the occluding effect of topical gaseous ozone application, Er:YAG-CO<sub>2</sub> lasers and their combinations with NaF gel on human dentine tubules by SEM analysis.

**Material and Methods:** Forty-two dentine specimens were divided into 7 groups. Group A, including specimens treated only with citric acid served as the control. Group B was treated with 2% NaF gel alone. Groups C and D were irradiated with Er:YAG (30 Hz-60mJ, 10 sec) and CO<sub>2</sub> (1W, CW, 10 sec) lasers, respectively. Groups E and F received NaF gel plus Er:YAG or CO<sub>2</sub> laser irradiation and Group G received only topical gaseous ozone application (30 sec).

**Results:** Under SEM analysis, some narrowing of the exposed tubule orifices were seen in the Group B. A melted, irregular surface structure with small peaks was observed in the Group



C.Group D also had a melted appearance, but a fibrillar deformation of the surface structure was seen. However, the surface morphologies were remarkably different in groups E, F and G. The tubule orifices were obviously occluded with depressed crater formation in Group E. The surface structure of Group F and G primarily showed a smooth appearance. In terms of numbers and diameters of open dentinal tubules, all treatments presented significant occlusion. There were no significant differences between the combination and ozone groups and they revealed significant superiority when compared with the rest of the groups.

**Conclusion:** The dentine tubules in all the laser and ozone groups were occluded, however more marked occlusions were seen in both combination and ozone groups.

## Topic: Clinical Research: Periodontal Therapy

### P0836

#### Patient-centered outcomes after subepithelial connective tissue grafts and coronally advanced flaps

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<sup>1</sup>Cluj-Napoca/Romania, <sup>2</sup>Timisoara/Romania, <sup>3</sup>Bern/Switzerland

**Aim:** Fear of imminent tooth loss and modification of sensitivity in surgical areas have not been monitored until now for patients with gingival recessions treated with coronally advanced flaps plus connective tissue grafts (CAF+CTG). This study evaluated the morbidity and other patient-centered outcomes associated with CAF+ CTG.

**Material and Methods:** 33 patients (age 30.25±6.88) with gingival recessions, were treated using CAF+CTG. At 14 days, 1, 3, 6, and 12 months after surgeries, they were evaluated for the parameters: aesthetics, root hypersensitivity, fear of imminent tooth loss, daily activities or nutritional habits, and for the levels of post-surgical morbidities. A Visual Analog Scale was used to evaluate patient-centered outcomes. The percentage of patients belonging to each of the severity scales, the mean values associated with each parameter and the statistical significance of the modification of the monitored parameters were calculated. Parametric F(Fisher) test and the Least Significant Difference post-hoc pair-wise comparisons were computed using SPSS (Statistical Package for Social Sciences, v.16) and SYSTAT (v. 12).

**Results:** The study found significant differences between baseline and all follow-up time points in root hypersensitivity ( $F(5.31) = 26.36$ , mean squared error  $MSE = 179.47$ ,  $p < 0.05$ ,  $2 = 0.45$ ) and in fear of imminent tooth loss ( $F = 72.39$ ,  $MSE = 213.250$ ,  $p < 0.05$ ,  $2 = 0.7$ ). The prevalence of fear of tooth loss was 99%. Aesthetics was significantly improved at 1, 3, 6, and 12-month visits, compared to the evaluation at 14 days ( $F = 30.704$ ,  $MSE = 241.150$ ,  $p < 0.05$ ,  $2 = 0.49$ ).

**Conclusion:** The severity of morbidities associated with the performed surgical technique seemed manageable. Patient perceptions may influence clinical decisions regarding the choice of the surgical technique.

## Topic: Clinical Research: Periodontal Therapy

### P0837

#### Er:Yag laser versus topical gaseous ozone as adjunctives to non-surgical periodontal therapy: a clinical and microbiological study

H. Gursoy, S. Algan, U. Noyan, B. Kuru, T. Kadir, S. Yilmaz

Istanbul/Turkey

**Aim:** The objective of this randomized clinical trial was to evaluate the clinical and microbiological results of the treatments with Er:YAG laser and topical gaseous ozone application used as adjunctives to mechanical periodontal therapy in chronic periodontitis (CP).

**Material and Methods:** Thirty CP patients were randomly divided into 3 groups each comprising 10 individuals with at least 4 teeth having at least one approximal site with a probing depth (PD) of  $\geq 5$  mm in each quadrant. Groups of patients received: (1) Scaling and root planing (SRP)+ Er:YAG laser (2) SRP+ Topical gaseous ozone (3) SRP alone. The microbiological and periodontal parameters were evaluated after 90 days.

**Results:** At the end of the experimental period, statistically significant improvements in plaque and sulcus bleeding index, PD and attachment level, as well as reductions in the number of total bacteria and proportions of obligately anaerobic microorganisms were observed within each group. Although intergroup comparisons revealed no significant microbiological differences, clinical findings as attachment gain, bleeding and PD reduction were found significantly higher in the Group 1 compared to the other groups.

**Conclusion:** Within its limits, this study demonstrated the possibility of better resolution of infection with combined SRP+Er:YAG laser treatment. However, microbiological results failed to demonstrate significant advantages of this combination in comparison with SRP alone or SRP+ Topical gaseous ozone.

## Topic: Clinical Research: Periodontal Therapy

### P0838

#### Ultrasonic determination of thickness of masticatory mucosa: reproducibility and validity

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Gent/Belgium

**Aim:** The aim of the present study was to apply an ultrasonic device in the oral cavity and to assess its reproducibility and validity. Furthermore, a pilot study investigating the stability of connective tissue graft by measuring the thickness was evaluated.

**Material and Methods:** To test the validity, two human cadaver edentulous maxillas were used. An ultrasonic device (Olympus) was applied to determine the thickness of mucosa at 50 different sites. Subsequently, these measurement points were individually marked and both maxillas were scanned using Micro-CT. The analysis of thickness was performed with software Mimics 14. The thickness measurements acquired with ultrasonic device and

Micro-CT were compared, taking the latter as gold standard.

In order to evaluate the stability of connective tissue graft thickness measurements were performed pre- and postoperatively at 2 weeks, 3 and 6 months.

**Results:** There was a linear relationship between the ultrasonic and the Micro-CT measurements ( $r = 0.840$ ,  $p < 0.001$ ) with a mean overrate of ultrasonic device of 0.20mm ( $p = 0.05$ ). There was a strong linear relationship between the first and second ultrasonic measurement ( $n = 24$ ) ( $r = 0.996$ ,  $p < 0.001$ ) with a mean difference of 0.10 mm ( $p = 0.471$ ). The results of the pilot study showed that 91% of the tissue thickness remains preserved after 6 months.

**Conclusion:** The ultrasonic device can be used as a non-invasive, reproducible and reliable method to evaluate the tissue thickness. Differences in reliability of ultrasonic assessments of thickness in different parts of the oral cavity may depend on the varying bone morphology of the maxilla and on the expression of palatal rugae.

## Topic: Clinical Research: Periodontal Therapy

### P0839

#### Comparison of systemic metronidazole and topical gaseous ozone as adjunctives to non-surgical periodontal therapy: a clinical and microbiological study

H. Gursoy, M. Bektaş, U. Noyan, B. Kuru, T. Kadir, S. Yılmaz  
Istanbul/Turkey

**Aim:** The objective of this randomized clinical trial was to evaluate the clinical and microbiological results of treatments with systemic metronidazole and topical gaseous ozone application used as adjunctives to mechanical periodontal therapy in chronic periodontitis (CP).

**Material and Methods:** Thirty CP were randomly divided into 3 groups each comprising 10 individuals with at least 4 teeth having at least one approximal site with a probing depth (PD) of  $\geq 5$  mm in each quadrant. Groups of patients received: (1) Scaling and root planing (SRP) + Systemic metronidazole (2) SRP+ Topical gaseous ozone (3) SRP alone. The microbiological and clinical parameters were evaluated after 90 days.

**Results:** At the end of the observation period, statistically significant improvements in plaque and sulcus bleeding index, PD and attachment level, as well as reductions in the number of total bacteria and proportions of obligately anaerobic microorganisms were observed within each group. Although intergroup comparisons revealed no significant microbiological differences, clinical findings as attachment gain, bleeding and PD reduction were found significantly higher in the Group 1 compared to the other groups.

**Conclusion:** Although no statistically significant differences in microbiological parameters were observed between all treatment groups, SRP+ systemic metronidazole showed clinical superiority when compared to the SRP+ Topical gaseous ozone and SRP alone

## Topic: Clinical Research: Periodontal Therapy

### P0840

#### Effect of antimicrobial agents on early in situ plaque-like biofilm formation

S. Torres, I. Tomás, J. Seoane, J. Blanco  
Santiago De Compostela/Spain

**Aim:** The purpose of this cross-over study was to examine the influence of chlorhexidine (CHX) and amoxicillin/clavulanic acid (AMOXICLAV) on in situ plaque-like biofilm (PL-biofilm) growth.

**Material and Methods:** After a professional toothcleaning, 10 healthy volunteers had to wear a special acrylic appliance, in which six specimens were inserted to allow the build-up of oral biofilms. The volunteers didn't receive any antimicrobial agent (negative control), they had to take AMOXICLAV 875/125 mg in three doses by day and they had to rinse twice daily with 0.2% CHX. After a 4 weeks wash-out period, a new test cycle was started. After 4 days of wearing, the specimens with the adhering biofilms were removed from the splints and stained with two fluorescent dyes. Under the confocal laser scanning microscope, biofilm thickness (BT, mm), area occupied by biofilm (AB, %) and bacterial viability (BV, %) were evaluated.

**Results:** The mean values of BT, AB and BV of the 4-day PL-biofilms under basal conditions were 25 mm, 79% and 50% respectively. The use of 0.2% CHX resulted in a BT of 6 mm, a AB of 21% and a BV of 14%; these differences were statistically significant compared with baseline. The use of AMOXICLAV resulted in similar results compared with baseline (BT= 21 mm, AB= 68% and BV= 56%). Differences between 0.2% CHX and AMOXICLAV were statistically significant.

**Conclusion:** In contrast to CHX, AMOXICLAV regimen applied under clinical conditions didn't show antibacterial and plaque-reducing properties against the in situ PL-biofilm.

## Topic: Clinical Research: Periodontal Therapy

### P0841

#### The effect of bisphosphonates on the progress of periodontal disease

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**Aim:** Introduction

Bisphosphonates are antiresorptive agents.

Bisphosphonates are administered systemically, thus have a systemic effect and can therefore also affect the alveolar bone remodeling.

A key feature of periodontal disease is in addition to the signs of gingival inflammation, loss of alveolar bone. It is unclear however whether the antiresorptive effect of bisphosphonates can stop the loss of alveolar bone in periodontitis. This is a systematic review with the aim to verify the effects of bisphosphonates on the clinical parameters of periodontal disease.

**Material and Methods:** Case report: The PubMed literature search on this topic found for Bisphosphonates 16396, Periodontal 46271, Bisphosphonates AND periodontal 139, Bisphosphonates AND periodontal AND animal 60 and for Bisphosphonates AND periodontal AND clinical AND trial 12 results.

In the clinical studies, four parameters were investigated: Probing Depth, Clinical Attachment Level, Bleeding on Probing and Radiological measurements of the enamel-cement border to the alveolar ridge.

The presentation of data from clinical trials are shown as a Forest Plot.

**Results:** Discussion: Of the 12 clinical trials for this survey work only three studies left for quantitative statistics and from the 60 preclinical studies, 12 were left for qualitative description. The results of the clinical studies consistently showed significant benefits for the bisphosphonate groups. In the preclinical studies in rats with experimental periodontitis, there were also significant benefits for bisphosphonates.

**Conclusion:** Bisphosphonates appear to inhibit not only the alveolar bone loss in periodontitis, but have also other effects on the periodontium. They lead to a reduction of inflammatory mediators in the gingiva.

Topic: Clinical Research: Periodontal Therapy

## P0843

### Effects of different root surface cleaning methods on root morphology. A scanning electron microscopic evaluation.

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Rochester/United States of America

**Aim:** Various methods are available to accomplish the goals of root scaling. The aim of this study was to examine the effects of different root surface cleaning methods on root morphology using scanning electron microscopy.

**Material and Methods:** 14 extracted human teeth were separated into seven groups of two teeth. Each group received 30 seconds of root instrumentation via one of the following: conventional curette (HuFriedy); air scaler (SONICflex, KaVo); ultrasonics A and B (A: Cavitron, Dentsply; B: NSK, Bräse); Er:YAG laser (KaVo, at 100 mJ/pulse and 10 pps); CO<sub>2</sub> laser (DEKA, at 0.5 W and 5 Hertz); and 980nm diode laser (Kavo, at 3 W power, pulse mode). Scanning electron microscopy (SEM) was used to observe morphological changes in root surfaces following instrumentation.

**Results:** The most extensive root damage was with the CO<sub>2</sub> laser that appeared to result in removal of the superficial layer of the root surface. The curette, Cavitron, 980nm diode laser and Er:YAG laser produced grooves of varying widths and depths in the superficial layer. NSK and SONICflex produced similar degrees of superficial layer alteration with less grooves and troughs than other methods of instrumentation.

**Conclusion:** The various root surface cleaning methods affected root surfaces differently, with NSK and SONICflex producing less grooves and troughs in the surface as compared to other methods.

Topic: Clinical Research: Periodontal Therapy

## P0844

### Adjunctive effects of photodynamic therapy for residual pockets in a single rooted teeth: a randomized controlled clinical trial.

G. Barrella, S.P. Pimentel, F.V. Ribeiro, F.R. Cirano, R. Casarin, M.Z. Casati

São Paulo/Brazil

**Aim:** The aim of this study was evaluate the effect of a single PDT as adjunct to SRP in RP (probing depth > 5mm with bleeding on probing) in single rooted teeth.

**Material and Methods:** A blind, split-mouth, randomized controlled trial was conducted in 15 subjects presenting at least two RP in single root teeth. The selected sites were assigned to receive PDT+SRP or SRP. Clinical parameters were assessed at baseline and 3 months post-therapies.

**Results:** Clinical parameters improved significantly after both therapies ( $p < 0.05$ ), whereas higher probing depth reduction and clinical attachment level gain were observed in the PDT+SRP group at 3 months ( $p < 0.05$ ).

**Conclusion:** The combined therapy using PDT associated with SRP may be considered an alternative for RP.

Topic: Clinical Research: Periodontal Therapy

## P0845

### Guided tissue regeneration with a rubber dam as an alternative barrier and impact of smoking.

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Ancona/Italy

**Aim:** The purpose of our clinical trial was to critically evaluate the results obtained from a guided tissue regeneration technique and a rubber dam as a barrier in smoking and non-smoking patients.

**Material and Methods:** We selected 28 patients with chronic advanced periodontitis: 14 were current smokers (20 cig/die) and 14 were non-smokers. Thirty-six periodontal sites amenable to regenerative surgery were treated according to the principles of the guided tissue regeneration (GTR) technique using rubber dam as a barrier. Probing depth, clinical attachment level, recession and hard tissue parameters at baseline and 1-years post surgery were evaluated by the same examiner and compared.

**Results:** 12 months after surgery, a statistically significant improvement of periodontal parameters was found overall when non-smokers were compared with smokers, in: probing depth (PD) reduction ( $4.6 \pm 2.5$ mm vs  $3.4 \pm 1.8$ mm), gain level ( $3.3 \pm 1.6$  vs  $2.1 \pm 2.1$ mm) and hard tissue fill ( $2.1 \pm 1.8$ mm vs  $0.8 \pm 2.3$ mm).

**Conclusion:** Since smokers' periodontal parameters also improved significantly, this improvement was nevertheless lower than among non-smokers, confirming the negative impact of smoking on periodontal regeneration. Rubber dam can be considered a viable, safe, and virtually cost-free option for periodontal regeneration in place of other membranes and/or materials currently available.

## Topic: Clinical Research: Periodontal Therapy

**P0846****Gumsaver - An accelerated therapy for pocket reduction using a twin headed interspace brush with converging angles designed specifically for patient-directed periodontal pocket cleaning**

H. Mostafa

Leamington Spa/United Kingdom

**Aim:** Periodontal disease is a highly prevalent condition, and its importance in states of chronic systemic illness has only recently been realised. Traditional therapy often involves the use of invasive and often repeated professional led procedures. This case study highlights that following oral hygiene instruction using a revolutionarily-designed brush an individual can eradicate all major signs of gingivitis and periodontitis.

**Material and Methods:** A 54 year-old female presented with long-standing periodontal disease. She had attended quarterly visits with her hygienist at a previous practice, for over 10 years. Basic Periodontal examination (BPE) scores were 4,1,3,3,1,4. 17 was grade 2 mobile and 3 periodontal abscesses had occurred in the previous 6 months. Following pocket charting and clinical radiographs, the patient was given 15 minutes oral hygiene instruction using the twin-headed Gumsaver brush. At 30 days follow up BPE and pocket charting were performed.

**Results:** At 30-day review, BPE scores had reduced to 3,0,0,0,0,0. 17 was no longer tender or mobile and the 9mm pocket had reduced to 2mm. The only remaining pocket >3.5mm in the 1st sextant was a 4mm pocket at mesio-palatal of 17. Subsequent review at 60 days revealed scores of 0,0,0,0,0,0. Radiographs at 18 months revealed complete resolution of the lateral periodontal abscess.

**Conclusion:** This case demonstrates exciting preliminary data for a novel device with dramatic improvements in clinical markers of disease. We would advocate use of Gumsaver, along with oral hygiene instruction as part of a patient-centred approach. Gumsaver is currently being evaluated in larger clinical studies.

## Topic: Clinical Research: Periodontal Therapy

**P0847****Impact of the periodontal treatment on the mastication's parameters in patients with chronic severe periodontitis: a Pilot Study**J. Duroux<sup>1</sup>, E. Nicolas<sup>2</sup>, J. Veyrune<sup>2</sup>, M. Hennequin<sup>2</sup><sup>1</sup>Clermont-Ferrand/France, <sup>2</sup>Clermont Ferrand/France

**Aim:** Study Objective was to evaluate the masticatory ability of subjects with severe generalized periodontitis before and after periodontal treatment through the study of masticatory parameters (particle size, chewing time, number of masticatory cycles and frequency).

**Material and Methods:** Evaluations of the mastication parameters before and after periodontal therapy have been made with 8 subjects. Mini Nutritional Assessments (MNA), oral quality of life (GOHAI) and pain scale were also proposed to

the patient.

**Results:** After the periodontal therapy, a significant decrease in particle size ready to be swallowed was demonstrated, as well as an increase (not significant) in the masticatory frequency. An increase in comfort during the mastication has been shown through the pain scale, EVA study, difficulty of chewing and GOHAI.

**Conclusion:** it could be hypothesized that a decrease in the inflammation of periodontal mechanoreceptors allows an improvement of the kinematic parameters for food models. However, the discrimination ability of the food maintained even in the presence of periodontal disease. A decrease in the median of masticated particle size (D50) is observed after treatment; it remains greater than 4 mm, a value beyond which the mastication of the food is considered insufficient. This study demonstrated an improvement in the objective ability (measurable) to reduce food in fragment, and in the subjective feeling of a function undisturbed, oral well-being, social and psychological, linked to the periodontal treatment performed.

## Topic: Clinical Research: Periodontal Therapy

**P0848****Efficacy of collagen membrane seeded with autologous gingival fibroblasts in gingival recession treatment: 12 months follow up**S.S. Hakkı<sup>1</sup>, S. Köseoğlu<sup>2</sup>, M. Sağlam<sup>2</sup>, S.B. Bozkurt<sup>1</sup>, I. Duran<sup>3</sup><sup>1</sup>Konya/Turkey, <sup>2</sup>Izmir/Turkey, <sup>3</sup>Bolu/Turkey

**Aim:** One of the most common esthetic concerns associated with periodontal tissues is gingival recession. Recently, tissue engineering technology has already been developed and applied in periodontology. The aim of this study is to compare the clinical efficacy of collagen membrane with/without autologous gingival fibroblasts under a coronally positioned flap for root coverage.

**Material and Methods:** In this split-mouth, controlled clinical cases, 28 sites from 14 patients with Miller Class I recessions affecting canines or premolars in the maxillary arch were selected. One tooth in each patient was randomized to receive either a collagen membrane (CM) (control group) or a collagen membrane seeded with autologous gingival fibroblasts (CM-GF) (test group) under a coronally positioned flap. Thickness of gingiva, gingival recession, root coverage amounts and the others clinic parameters were recorded by a calibrated examiner at baseline, 6. and 12. months. Furthermore gingival recession and root coverage amount were evaluated using photogrammetric analysis at baseline, 6. and 12. months.

**Results:** Both treatments resulted in a significant gain of root coverage when compared to baseline. Statistically significant increase was detected in root coverage amount of test group when compared to control group. No significant difference was noted between the test and control site regarding thickness of gingiva.

**Conclusion:** The results indicate that a CM-GF prepared by tissue-engineering technology can be considered as an alternative method for the treatment of Miller Class I recession defects. (supported by TUBITAK/SBAG-107S3)



## Topic: Clinical Research: Periodontal Therapy

**P0849****One-year clinical results of Er,Cr:YSGG laser application in addition to scaling and root planing in patients with early to moderate periodontitis**S. Kelbauskienė*Kaunas/Lithuania*

**Aim:** The aim of this study was to assess clinical effectiveness of Er,Cr: YSGG laser application in adjunct to scaling and root planing as compared to scaling and root planing alone, in treatment of patients with early to moderate periodontitis.

**Material and Methods:** Patients selection: no periodontal treatment received within the last 12 months, no systemic diseases, no use of systemic antibiotics at least 6 months prior to, during and 12 months after the treatment, non smokers. 30 patients with the diagnosis of early - moderate periodontitis, 26-58 years of age were included in the study. The study was performed according to a split-mouth design, on single-rooted teeth. 278 teeth with positive bleeding on probing (BOP), subgingival calculus and a PD (probing depth) more than 3 mm. Of the total of 1668 sites examined, 1088 sites exhibited the probing depth more than 3 mm.

**Results:** The results of the present study have demonstrated that non- surgical periodontal treatment with either combination of a laser and SRP, or root scaling and planing alone lead to clinically and statistically significant improvements in all investigated parameters at 2, 3, 6, and 12 months following the treatment. The observation that in all cases there were no post-operative complications indicates good tolerance of all conservative treatment procedures received.

**Conclusion:** Based on our study, we conclude that scaling and root planing alone yield considerable oral health improvement in patients with early to moderate periodontitis, however an additional laser application provides a significantly more stable and long - lasting result.

## Topic: Clinical Research: Periodontal Therapy

**P0850****Treatment of two symmetrical defects on maxillary anterior teeth with different mucogingival operations**M. Ozalp, D. Yaman, S. Aksu*Istanbul/Turkey*

**Aim:** The subepithelial connective tissue graft (SCTG) is currently the golden standard in the treatment of gingival recession when the objective is root coverage. However, the morbidity during the healing phase in palate may result in uncomfortable conditions for the patient. The aim of this case is to evaluate in two symmetrical defects on maxillary lateral incisors with different mucogingival operations.

**Material and Methods:** Periodontally healthy 29 year old woman who complains of the sensitivity due to symmetrical recessions on

maxillary lateral incisors treated with the sCTG using envelope technique at the same surgery. Initial measurements showed an average of 3 mm gingival recession. Clinical measurements were repeated after 4 weeks. Although there was a complete coverage on left maxillary incisor, the right one still had 2 mm recession. Since the patients's complaints continued and she did not want to have a second wound on her palate, that time the double papilla pedicle graft (DBPG) procedure was performed on the right side.

**Results:** Complete coverage on the right side has been obtained following the second surgery.

**Conclusion:** As a result the treatment of two symmetrical defects on maxillary lateral incisors may have different outcomes. DBPG procedure can be suggested as an advantageous operation in palatally compromised cases.

## Topic: Clinical Research: Periodontal Therapy

**P0851****SDD-mediated host modulation of generalized aggressive periodontitis as an adjunctive to nonsurgical therapy**Y. Kim, J. Choi*Yongsan-Si, Gyeongangnam-do/Korea*

**Aim:** Introduction Generalized aggressive periodontitis (GAP) is characterized by multiple episodes of asynchronous bursts of destructive activity resulting in the premature loss of teeth. Due to the complexity in the nature of the GAP, the control of the disease is not yet feasible. The standard treatment protocol has been the mechanical debridement with systemic antibiotics. An emerging concept of subantimicrobial-dose doxycycline (SDD)-mediated host modulation stems from observations that it can inhibit the collagenase activity. The present case report describes a sophisticated management of GAP with SDD-mediated host modulation combined with nonsurgical periodontal therapy.

**Material and Methods:** Case report A young patient suffering from GAP has received scaling and root planing with systemic antibiotics (amoxicillin + metronidazole). Furthermore, doxycycline (20 mg, twice a day) was administered for 1 month. At 1-year, all the sites manifesting moderate to deep pocket depths returned to normal sulcus depths, negating the surgical intervention. The radiographic analysis revealed the convergence of the angular to the flat-type osseous profile with negligible components of furcation invasion.

**Results:** Discussion There were no SDD-associated adverse events noticeable. Nevertheless, the result may have to be interpreted with caution because of the antibiotic resistance that is theoretically plausible calling for the randomized controlled studies to validate the usefulness of the SDD.

**Conclusion:** Conclusion Within the limits of the current observation, the adjunctive use of SDD as a host modulation provide a enhanced clinical outcome beyond the limit of what is attainable by the conventional approach consisting of mechanical intervention plus systemic antibiotics.

## Topic: Clinical Research: Periodontal Therapy

**P0852****Early postoperative healing following Single Flap Approach to access intraosseous periodontal defects.**

A. Simonelli, R. Farina, L. Minenna, L. Trombelli

Ferrara/Italy

**Aim:** The Single Flap Approach (SFA) is a novel, simplified, minimally-invasive surgical approach to access intraosseous periodontal defects leaving the interproximal supracrestal gingival tissues intact (Trombelli et al. 2007, 2009, 2010, 2011). Previous studies indicated that defects accessed with a buccal SFA and different reconstructive technologies showed different quality of early wound healing (Trombelli et al. 2010). The present study was performed to evaluate the early postoperative healing following a buccal SFA when used to access deep intraosseous defects.

**Material and Methods:** Thirty-five patients (24 males; mean age:  $51.4 \pm 8.5$  years) were consecutively included in the study and contributed 43 intraosseous defects. All defects were accessed with a buccal SFA with or without a regenerative technology. Evaluation of wound healing at 2 weeks postoperatively was performed using the Early Wound Healing Index (EHI, Wachtel et al. 2003).

**Results:** EHI was 1.0 (IR 1.0 - 2.5, min-max: 1-4). Twenty-three defects exhibited a score 1 (no fibrin line in the interproximal area), 9 defects a score 2 (fibrin line in the interproximal area), 4 defects a score 3 (fibrin clot in the interproximal area), whereas 7 defects showed a score 4 (partial necrosis of the interproximal tissue). Tooth type, presence of a diastema, presence of bleeding, use of a regenerative technology, presence of an interproximal tissue crater, and defect configuration significantly influenced optimal wound closure.

**Conclusion:** Buccal SFA seems a valuable surgical approach to enhance early wound healing (i.e. complete flap closure at 2 weeks) in the treatment of deep intraosseous defects.

## Topic: Clinical Research: Periodontal Therapy

**P0853****Evaluation of the Efficacy of Photodynamic Therapy as Adjunct to periodontal treatment in Patients with Aggressive Periodontitis**F.B. Garcia<sup>1</sup>, A.T. Dias<sup>2</sup>, E.M.B. Tinoco<sup>1</sup>, R.G. Fischer<sup>1</sup><sup>1</sup>Rio De Janeiro/Brazil, <sup>2</sup>Niteroi/Brazil

**Aim:** Aggressive periodontitis is an inflammatory process of bacterial origin mediated by host immune response and is probably the most serious form of periodontal disease, with destruction of the structures of protection and support, with fast course, often leading to premature loss of the teeth and, in some cases, adjunct antimicrobial therapy is need in addition to mechanical therapy. The aim of this randomized controlled trial was to investigate the clinical effect of photodynamic therapy as an adjunct to nonsurgical periodontal treatment in patients with aggressive periodontitis.

**Material and Methods:** The following clinical parameters were

evaluated: visible plaque index, bleeding on probing, probing pocket depth, relative attachment level, furcation involvement and mobility. We selected ten patients with aggressive periodontitis, which were examined in the baseline to three months. The study design consisted of a split mouth model, where a quadrant was treated with scaling and root planing and photodynamic therapy (diode laser) and the other only with scaling and root planing.

**Results:** Three months after the end of the treatment, the treatment groups showed similar results for all clinical parameters evaluated: both therapies have been successful and showed reduction of pocket depth, gain of relative attachment level, reduction of visible plaque index, reduction of bleeding on probing, decreased furcation involvement and decreased mobility, but without statistically significant differences between them.

**Conclusion:** Within the limitations of the present study the results suggest that photodynamic therapy adjunct to non-surgical periodontal mechanic treatment was as effective as the non-surgical periodontal mechanic treatment alone.

## Topic: Clinical Research: Periodontal Therapy

**P0854****Clinical and microbiological evaluation of the efficacy of an air polishing device with glycine powder during supportive periodontal therapy.**

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Thessaloniki/Greece

**Aim:** To determine the efficacy of subgingival air polishing with glycine powder during supportive periodontal therapy (SPT).

**Material and Methods:** 25 chronic periodontitis patients involved in a SPT program participated in this study. Four different treatment methods (subgingival air polishing with glycine powder, ultrasonic instrumentation, hand instrumentation and supragingival debridement) were randomly assigned to a quadrant of the dentition and applied into residual pockets at baseline, three and six months. Pocket depth, Clinical attachment level, Recession, Gingival Index and Plaque Index were assessed. At the initial examination and one month later a questionnaire was filled from each patient regarding acceptance and tolerance of each method. Microbiological samples were analyzed for the detection of *Porphyromonas gingivalis*, *Tannerella forsythia*, and *Treponema denticola* using the "checkerboard" DNA-DNA hybridization technique.

**Results:** The air polishing group showed a statistically significant improvement of pocket depth during the first three months (Wilcoxon's Signed Rank test,  $p < 0.008$ ). The negative control group showed no statistically significant differences in clinical parameters. When the air polishing group was compared with the ultrasonic instrumentation and hand instrumentation groups, the statistical analysis showed statistically significantly better clinical findings for the last two groups (Mann-Whitney test,  $p < 0.008$ ). The statistical analysis of the specific microbiological data did not reveal any significant changes during the study nor in the comparison between groups (McNemar test,  $p > 0.008$ ).

**Conclusion:** The subgingival use of an air polishing device with the glycine powder does not seem to have the same long-term clinical efficacy compared to conventional treatment methods, although it was better accepted by all patients as a treatment choice.

Topic: Clinical Research: Periodontal Therapy

## P0855

### The Effect of Non-surgical Periodontal Treatment on Patients with Pemphigus Vulgaris-Case Series

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**Aim:** Pemphigus vulgaris (PV) is an autoimmune disease characterized by acantholysis in the epithelium. PV frequently begins with oral lesions and progress with the skin lesions. Oral desquamative lesions can be early clinical symptoms of PV. This paper describes clinical features and treatment of three patients who is diagnosed as having PV.

**Material and Methods:** Three patients who is diagnosed as having PV were enrolled in this study. These patients were having systemic corticosteroid administration but no additional topical corticosteroids were used. The patients received periodontal treatment and oral hygiene instructions. The severity and frequency of desquamative lesions were evaluated.

**Results:** In these cases, in spite of the systemic corticosteroid administration there was no recovery in oral condition, the lesions have been increasingly continued. The oral health has been obtained by periodontal treatment and a strict plaque control regime. Consequently, a serious recovery in oral lesions have been determined.

**Conclusion:** In cases with gingival tissue involvement, in order to constitute oral health and control lesions, periodontal treatment and oral hygiene instructions would be an important factor beside systemic steroid administration.

Topic: Clinical Research: Periodontal Therapy

## P0856

### Plaque elimination using a novel oral irrigation tip

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<sup>1</sup>Zürich/Switzerland, <sup>2</sup>Zurich/Switzerland

**Aim:** To evaluate the plaque removal efficacy of a novel brush attachment on an oral irrigation device and compare the results to those obtained with either a classic water jet attachment or a sonic toothbrush.

**Material and Methods:** Six volunteers gave informed consent and refrained from oral hygiene for 36 hours prior to baseline plaque assessment (Silness & Loe, 1964). Half were instructed to remove as much plaque as possible, over a 2 minute time span, using one water jet attachments, while the other subjects used the alternate attachment. A week later the groups repeated the exercise, switching the type of attachment used. After another week, both groups repeated the exercise using a sonic toothbrush. One dental hygienist supervised/timed the plaque removal efforts of each volunteer. A second experienced, blinded, hygienist recorded the plaque indices. Kolmogorov-Smirnov and Shapiro-Wilks tests determined data normality, then mean differences between pre- to post-treatment plaque scores at each session were analysed by paired sample t-test followed by Bonferroni correction for multiple testing.

**Results:** The mean overall plaque score differences ( $\pm$ SD) were:

0.4 ( $\pm$ 0.1) in the classic group, 0.5 ( $\pm$ 0.1) in the brush group and 0.7 ( $\pm$ 0.2) in the sonic group. These results were only significant ( $p=0.006$ ) for the difference between the classic and sonic groups.

**Conclusion:** Significant plaque elimination was achieved with all 3 cleaning devices. While there was a statistical significance shown by the sonic toothbrush over a classic irrigator tip, the brush tip was neither better than the classic tip nor was it less effective than the sonic toothbrush.

Topic: Clinical Research: Periodontal Therapy

## P0857

### A histologic study on the effect of glycine powder on the epithelium of the periodontal pocket during subgingival application with an air-polishing device in the canine

S. Rodiou, L. Tsalikis, P. Dagalis, A. Konstantinidis

Thessaloniki/Greece

**Aim:** To assess the traumatizing effect of glycine powder, sodium bicarbonate powder and ultrasonic device on the sulcular and junctional epithelium.

**Material and Methods:** Canines, second and third premolars of 3 beagle dogs were used as experimental teeth, while the fourth premolars were used as control. The buccal sides of these teeth were assigned to one of the following interventions: 1) air polishing for 5 seconds with glycine powder with the powder - water jet directed into the sulcus, 2) air polishing for 5 seconds with sodium bicarbonate powder with the powder - water jet directed into the sulcus, 3) subgingival debridement with an ultrasonic device for 5 seconds, with a constant sweeping movement. The fourth premolars of each dog remained untreated and served as control group. Following euthanasia of the dogs, the teeth were decalcified and sections were taken in a buccal - lingual direction. Damaged gingival epithelium was assessed by light microscopy and quantified by a histological score (values 1 - 4).

**Results:** In the glycine powder group 1 section was rated with score 3 and 2 sections were rated with score 4. In the sodium bicarbonate group 2 sections were rated with score 2, 1 section with score 3 and 2 sections with score 4. In the ultrasonic group 1 section was rated with score 1, 3 sections with score 3 and 1 section with score 4. In the control group all specimens were rated with score 1.

**Conclusion:** In all intervention groups the severity of gingival erosions caused by different methods is similar.

Topic: Clinical Research: Periodontal Therapy

## P0858

### A two-year assessment of the use of augmented and non-augmented connective tissue from the hard palate mucosa membrane in order to increase gingival thickness.

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Gorlice/Poland

**Aim:** The process of covering gingival recession with the use of palatal connective tissue is currently the most widespread method of its treatment. When the mucous membrane of the palate is too thin, harvesting of connective tissue graft (CTG) is very unlikely. In order to obtain the required thickness prior to treatment procedure, donor site was augmented using collagen sponge. The aim of this study was clinical assessment of increasing gingival thickness after gingival recessions coverage using lateral positioned flap with augmented and non-augmented CTG.

**Material and Methods:** 33 patients with 114 gingival recessions I, II Miller's class were treated using 26 augmented CTG (test group-T) and 26 non-augmented CTG (control group-C). Gingival thickness (GT) was marked for gingival recession in I Miller's class as GT1 in the middle of width of attached gingiva, GT2-2mm behind the muco-gingival junction and II Miller's class BCAL - 2 mm behind clinical attachment level.

**Results:** The average gingival thickness in GT1 increased from  $1,06 \pm 0,24$  mm at baseline to  $1,49 \pm 0,19$  mm after 24 months (T) and from  $1,03 \pm 0,24$  mm to  $1,24 \pm 0,17$  mm (C). For GT2 it increased from  $1,04 \pm 0,31$  mm to  $1,48 \pm 0,24$  mm (T) and from  $0,95 \pm 0,25$  mm to  $1,13 \pm 0,17$  mm (C). In BCAL point gingival thickness increased from  $0,98 \pm 0,29$  mm to  $1,34 \pm 0,19$  mm (T) and from  $0,95 \pm 0,26$  mm to  $1,14 \pm 0,16$  mm (C) respectively. All differences between groups were statistically significant ( $p < 0,000$ ).

**Conclusion:** Gingival recession coverage using lateral positioned flap procedure with previously augmented CTG brings better statistically significant results of gingival thickness increasing in comparing to non-augmented CTG.

Topic: Clinical Research: Periodontal Therapy

**P0859**

### The analyze by finite element of strains in periodontal ligament and alveolar bone during orthodontic tooth movement

I. Luchian, O. Tanculescu, I. Rudnic, S. Martu  
Iasi/Romania

**Aim:** Orthodontic tooth movement (OTM) is achieved by applying an orthodontic force system to the brackets. The (re) modeling processes of the alveolar support structures are triggered by alterations in the stress/strain distribution in the periodontium. The aim of the present investigation was therefore to use the FEM, for to determine the influence of force magnitude in the stress and strain distribution in the alveolar support structures.

**Material and Methods:** Human jaws segments obtained from autopsy were microCT-scanned and sample-specific finite element (FE) models were generated. The material behavior of the PDL was considered to be nonlinear and non-symmetric and the alveolar bone was modeled according to its actual morphology. A series of FEA analyses investigated the influence of the moment-to-force ratio, force magnitude, and chewing forces on the stress/strain in the alveolar support structures and OTM.

**Results:** Stress / strain findings were dependent on alveolar bone's morphology. Because of the non linear behavior of the PDL, distinct areas of tension, and compression could not be detected. Secondary load transfer mechanisms were activated and the stress/strain distribution in the periodontium was concealed by occlusal forces.

**Conclusion:** The finite element method (FEM) has proved to be a valid and reliable technique for the calculation of the local state of deformation and loading of complex structures. Because roots and alveolar bone morphology are patientspecific, FE-analysis of orthodontic loading regime should not be based on general models.

Topic: Clinical Research: Periodontal Therapy

**P0860**

### Impact of different dosages and duration of systemic antibiotic therapy in the treatment of generalized chronic periodontitis: a double-blinded, placebo-controlled, RCT- preliminary results.

I.J. Borges, M. Faveri, L.C. Figueiredo, P.M. Duarte, M. Feres  
Guarulhos/Brazil

**Aim:** Although metronidazole (MTZ) + amoxicillin (AMX) has been constantly used as an adjunct to the periodontal treatment, the optimal dosage and duration of this antibiotic protocol is still unclear. Therefore, the aim of this study was to compare the clinical outcomes of different doses of MTZ as well as of the duration of the systemic administration of MTZ+AMX in the treatment of generalized chronic periodontitis (ChP).

**Material and Methods:** Sixty subjects were randomly assigned to receive scaling and root planning (SRP)-only (control group) or combined with 250 mg or 400 mg of MTZ, plus AMX (500 mg), for either 7 or 14 days (four test groups). Subjects were clinically monitored at baseline and at 3 months post-therapy.

**Results:** The four antibiotic groups exhibited overall better clinical results in comparison with the control group. However, subjects receiving MTZ (250mg or 400 mg) + AMX during 14 days presented the deepest reduction in the full-mouth mean probing depth (PD) and gain in clinical attachment (CA) in comparison with those treated with SRP-only ( $p < 0.05$ ). These two test groups also exhibited a greater mean gain in CA in initially deep sites and a lower percentage of sites with PD > 5 mm at 3 months post-treatment, in comparison with the control group ( $p < 0.05$ ).

**Conclusion:** The adjunctive use of MTZ+AMX during 14 days, independently of the MTZ dosage used, offers short-term clinical benefits, over SRP alone, in the treatment of subjects with generalized ChP. The added benefits of the 7-days antibiotic regimen were less evident.

Topic: Clinical Research: Periodontal Therapy

**P0861**

### A pilot study to evaluate the potential of subgingival calculus detection of a 655nm InGaAsP laser (DIAGNOdent®) in vivo

R. Gregor  
Vienna/Austria

**Aim:** 1) To examine and summarize the background literature. 2) The practical applicability of the test methodology of the study



design. 3) Evaluation of preliminary results as an indication of the sensitivity and specificity of the laser in vivo.

**Material and Methods:** 5 Patients pretreated with initial therapy requiring periodontal surgery were examined preoperatively with the laser to detect subgingival calculus and intraoperatively the tested areas were documented with photographs. Postoperatively, the results were compared and evaluated.

**Results:** 5 Patients with 64 sites on 13 teeth were examined. 42 sites could be used for evaluation. Sensitivity of DIAGNOdent®:  $P = 0.73$ , Specificity of DIAGNOdent®:  $P = 0.97$ ; 73% of the subgingival calculus on the root surface could be detected by the laser device, in this pilot study. The 95% Confidence Interval (CI) was [0.39; 0.94] for the sensitivity. These data of the CI indicate that the evidence for this statement is low. The 95% CI for the specificity was [0.83; 1].

**Conclusion:** The research in the field of fluorescence of dental hard tissues increases substantially, since the early '80s. Nevertheless, the cause of the fluorescence for each medium is not yet fully elucidated. For the diagnosis of caries and subgingival calculus two excitation wavelengths in the ultraviolet to the violet and the red spectrum are currently being investigated, worldwide. With the InGaAsP laser, a reasonable completion of treatment options after initial therapy of periodontitis could be found, if the results of the pilot study will be confirmed.

Topic: Clinical Research: Periodontal Therapy

**P0862**

### Effect of aging on the pluripotential capacity and regenerative potential of human periodontal ligament stem cells

F. Chen

*Xi'an/China*

**Aim:** Multipotent postnatal stem cells could be isolated from human periodontal ligaments and promise to large-scale expansion, offering a reliable cell source for clinical use in periodontal regeneration. However, the effects of aging on their mesenchymal stem cell (MSC) properties remain undefined. The aims of this study were to isolate and characterize the PDL stem cells (PDLSCs) derived from human impacted third molars of different aged donors, and to compare their pluripotential capacity and regenerative potential.

**Material and Methods:** PDL tissues were obtained from 90 surgically extracted third molars and divided into four groups according to the donor's age. For each group, the colony-forming ability, proliferative capacity, migratory potential, the cell surface antigens, differentiation ability, alkaline phosphatase activity, and gene expression of PDLSCs were contrastively evaluated and quantified for statistical analysis. Regenerative potential was assessed by an in vivo ectopic transplantation model.

**Results:** Human PDLSCs were successfully isolated and characterized as MSCs in all 90 teeth. PDLSCs derived from different aged donors were successfully differentiated under osteogenic and adipogenic microenvironment. The proliferative and migratory potential as well as the differentiative capacity of PDLSCs decreased along with increasing age ( $P < 0.05$ ). PDLSCs derived from donors whose age is  $62.6 \pm 6.8$  have a statistically significant decrease in pluripotential capacity as compared to those derived from relatively young donors ( $P < 0.01$ ).

**Conclusion:** Human PDLSCs could be successfully isolated from PDL tissue derived from different aged donors, but age-related changes of the MSC properties should be taken into account whenever they are intended to be used for investigations.

Topic: Clinical Research: Periodontal Therapy

**P0863**

### The improvement of different ratio chitosan thermosensitive hydrogel for periodontal therapy

Q. Wang, S. Zang, B. Peng, Z. Ma, X. Wang

*Xi'an/China*

**Aim:** To improve the sterilization method and evaluate the general properties of the chitosan thermosensitive hydrogels in different ratio.

**Material and Methods:** Chitosan powder were treated by high temperature autoclave before making two different ratio (9:1 7:1) chitosan thermosensitive hydrogels. The changes of viscosity, strength, thermosensitivity, gelation time were observed by physical methods. To immerse the gel into culture medium completely with lysozyme, blotted and weighed at different time intervals to compare their biodegradability. Ultrastructure of the gel was observed by SEM. The changes of the cell activity were observed by dapi staining and laser confocal microscope. MTT assay was used to evaluate the cell toxicity.

**Results:** The viscosity of chitosan thermosensitive hydrogels were 45~50 pas. The gelation time was 5~6 minutes. The gel structure was more stable and porous network structure was observed among  $0.385\mu\text{m} \sim 2\mu\text{m}$ . The biodegradable speed was slower in the first four days and then increased significantly in medium with lysozyme. MTT assay showed that the periodontal ligament cells can growth and proliferate well in it, either contact with the materials or treated by extractive medium. There was no evident difference between 9:1 and 7:1 groups.

**Conclusion:** The different sterilization methods may affect the characteristics of chitosan thermosensitive hydrogels. Our method improve its stability and make no changes of its biological properties.

Topic: Periodontal plastic surgery

**P0864**

### Gingival Byotype and Gingival Recession, its relation to Plastic Surgery

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<sup>1</sup>Monterrey/Mexico, <sup>2</sup>Granada/Spain

**Aim:** Gingival recessions are observed among general population including subjects affected from periodontal disease as healthy people with high levels of oral hygiene, where aggressive brushing displaces gingival margin apically. The aim of this presentation is to show the correlation of the thickness or gingival byotype as related to the presence of gingival recession, gingival byotypes have been linked to the outcomes of periodontal plastic procedures.

**Material and Methods:** A total of 618 adults ages 18-70, females and males, healthy and non advanced periodontally affected

subjects were examined for gingival recessions using Miller's index with the use of a N.C. probe, gingival biotype was assessed visually by seeing for transparency of a probe inserted through the gingival margin it was adjudged to be a thin tissue biotype.

**Results:** Thin biotype was more prevalent in the studied population, where recession was observed in 49%. Miller class II in 39%, class I in 29%, class III in 25% and class IV in 7%. A previous study where coronal flaps with EMD to cover marginal recessions were evaluated, results at 12 months showed significant root coverage and gain in keratinized gingiva in thin biotypes. Other study to cover recessions with connective tissue grafts and thin gingiva was observed in one-third of the sample, root coverage was observed after 12 months.

**Conclusion:** In our study the most affected population with recessions was observed in males younger than 30 years old. A correlation between gingival recessions and thin biotype was observed and linked to the outcomes of plastic surgery.

Topic: Periodontal plastic surgery

**P0865**

### The Use of Free Buccal Fat for Treatment of Severe Gingival Recessions

E. Front, Z. Laster, F. Kablan

Poriya/Israel

**Aim:** The etiology of gingival recessions is multifactorial. Fat tissue in the oral cavity is widely available and easily accessed. The use of fat tissue as graft is well known in maxillofacial surgery for closing of oro-antral fistulae and other small to medium perforations in the oral cavity as well as large perforations of the Schneiderian membrane in sinus elevation procedure. For mucogingival surgery the buccal fat pad was used, as a pedicle, however not as a free graft. The aim of our study is to present a new technique using free buccal fat (FBF) for coverage of severe mucogingival recessions.

**Material and Methods:** A technique for harvesting intra-oral FBF for use in mucogingival surgery is presented. Ten patients with 17 teeth presenting severe gingival recessions were treated using FBF and coronally positioned flap (CPF). Gingival recessions (GR) as well as the width of keratinized tissue (KT) were recorded at baseline and 9 month after surgery. Patients discomfort was evaluated 14 days postoperative.

**Results:** A total of 17 gingival recessions were treated using FBF+CPF. At 9 month significant reduction of recession occurred ( $P < 0.001$ ). The amount of KT significantly increased after treatment ( $P < 0.001$ ).

The procedure was well tolerated with no major postoperative complications.

**Conclusion:** The new, simple, technique for treatment of severe gingival recessions using FBF+CPF resulted in statistically significant reduction in gingival recessions and significant increase of the amount of KT, with stable results over a nine-month period and no postoperative complications.

Topic: Periodontal plastic surgery

**P0866**

### Comparative clinical split-mouth study of coronally advanced flap (CAF) with or without plasma rich growth factors (PRGF) in the treatment of human gingival recessions. A 6 months follow-up study.

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<sup>1</sup>Turin/Italy, <sup>2</sup>Chieri/Italy

**Aim:** This prospective comparative study evaluates the clinical and aesthetic outcomes and patient morbidity of a coronally advanced flap (CAF) with or without plasma rich growth factors (CAF+PRGF) in the treatment of gingival recessions.

**Material and Methods:** Ten non-smoking patients with bilateral Miller Class I or II single gingival recessions were selected for a split-mouth study. In each patient one site was randomly assigned to the CAF + PRGF procedure (test group) while the contralateral area to the CAF alone (control group). The parameters recorded at baseline (T0) and 6 months post-operatively (T1) were recession depth (R), probing depth (PD), clinical attachment gain (CAL) and keratinized tissue width (KT). Aesthetic evaluations at T1 were made both by a clinician and by the patients who also evaluated post-operative swelling and pain.

**Results:** At T0 mean R was  $2.80 \pm 0.92$  mm in the test group and  $2.60 \pm 0.70$  mm in the control group. In each group R reduction and CAL gain from T0 to T1 were statistically significant ( $p < 0.01$ ). Mean root coverage at T1 was  $90.0\% \pm 24.2\%$  in the test group and  $75.4\% \pm 35.7\%$  in the control group. Complete root coverage (CRC) at T1 was achieved in 80% of the test sites and in 60% of the control sites. Differences between the groups for all clinical parameters including aesthetic assessments and post-operative morbidity were not statistically significant.

**Conclusion:** CRC occurred more frequently in the CAF+PRGF group compared to the CAF group without statistically significant differences.

Topic: Periodontal plastic surgery

**P0867**

### Treatment of Miller Class I-II multiple gingival recessions with the modified coronally advanced tunnel technique by means of a bioresorbable collagen matrix (Mucograft®): A prospective pilot case series

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<sup>1</sup>Budapest/Hungary, <sup>2</sup>Bern/Switzerland

**Aim:** The aim of this prospective pilot case series was to clinically evaluate the treatment of Miller Class I, II multiple adjacent gingival recession defects (MARTD) using the modified coronally advanced tunneling technique (MCAT) in combination with a bioresorbable collagen matrix (Mucograft®).

**Material and Methods:** 8 subjects in good general health exhibiting multiple Miller Class I, II MARTD (i.e. at least

3 adjacent recessions per site) were included. Recession sites were treated using the MCAT technique in combination with a bioresorbable collagen matrix (Mucograft®, Geistlich, Wolhusen, Switzerland). The following clinical parameters were assessed at baseline and at 1, 3, 6 and 12 months postoperatively: full mouth plaque score, full mouth bleeding score, probing pocket depth, gingival recession depth and width, thickness and width of keratinised gingiva,

**Results:** No allergic reactions, soft tissue irritations or matrix exfoliations occurred at treated sites. Mean depth of gingival recession decreased from  $1,98 \pm 1,00$  mm (baseline) to  $0,33 \pm 0,57$  mm (12 months postoperatively). Mean width of keratinised gingiva increased from  $2,98 \pm 1,55$  mm (baseline) to  $3,48 \pm 1,47$  mm (12 months postoperatively). Complete root coverage was found in 71% of treated sites. Postoperative complaints were low, patient acceptance was generally high.

**Conclusion:** These outcomes indicate that: i) treatment of Miller Class I-II MARTD using the MCAT technique combined with a bioresorbable collagen matrix (Mucograft®) may result in substantial mean root coverage and ii) Mucograft® may represent a valuable alternative to connective tissue grafting, resulting in low patient morbidity and high patient acceptance

## Topic: Periodontal plastic surgery

### P0868

#### Principles of Successful Gingival Grafting

D. Corcoran, D. Corcoran

Dublin/Ireland

**Aim:** The aim of this presentation is to outline certain techniques that can improve the success rate for gingival grafting. Techniques will be outlined for the free gingival graft procedure and the connective tissue graft procedure.

**Material and Methods:** Clinical cases will be presented that demonstrate the techniques that are recommended for a successful outcome in gingival grafting. Free Gingival Graft is designed to : 1 Eliminate inflammation in the marginal gingivae 2 Eliminate frenal pull of the marginal gingivae 3 Create a zone of attached gingiva 4 Extend the vestibule to facilitate optimum oral hygiene procedures 5 To alleviate gingival and dental sensitivity 6 To gain root coverage in certain cases Connective Tissue Graft is designed to : 1 Gain root coverage in the aesthetic zone 2 Establish a stable gingival margin prior to restorative work 3 Augment the tissues on the facial aspect of implants 4 Develop pontic sites 5 Thicken the gingival tissues and transform a thin gingival biotype into a thick gingival biotype

**Results:** The illustrated cases will highlight techniques for success. For a free gingival graft (a) Root preparation (b) Recipient bed design (c) Use of template for graft harvesting (d) Harvesting good quality tissue For a connective tissue graft (i) Root preparation (ii) Pouch preparation or tunnel preparation (iii) Suturing of graft in place

**Conclusion:** Techniques designed to improve the success outcomes in gingival grafting are illustrated. They are designed to create stable grafts in the longterm, for both connective tissue grafts and free gingival grafts.

## Topic: Periodontal plastic surgery

### P0869

#### Evaluation of the effect of the platelet rich plasma on revascularization of free gingival grafts

D. Erbil Emes, A.Y. Gokbuget

Istanbul/Turkey

**Aim:** Revascularization is one of the key points of healing of free gingival grafts (FGG). Due to poor revascularization, healing may be compromised in FGG operations. Platelet rich plasma (PRP) can accelerate revascularization via increased growth factor release. The aim of the present study is to evaluate the effects of PRP on revascularization of FGG immunohistochemically (IHC).

**Material and Methods:** Biopsy specimens are obtained from the grafts which were performed on 35 Miller Type 2 recession defects, in which 19 were in control group and 16 were in experimental group. The defects in experimental group were treated using FGG+PRP and the defects in control group were treated using FGG alone. Biopsies were performed on the post-operative 7th day in order to do IHC analysis using VEGF, CD31 and CD34 monoclonal antibodies for the evaluation of revascularization. The evaluation was performed under light microscope.

**Results:** Between the groups, the difference of inflammation, necrosis and fibrosis were statistically insignificant. In the experimental group, VEGF expression was increased significantly. The increase of the number of new capillaries which were stained positive with CD31 and CD34 were statistically significant in the experimental group.

**Conclusion:** Our findings suggest that the use of PRP in the FGG procedures have a positive effect on wound healing via increasing revascularization.

## Topic: Periodontal plastic surgery

### P0870

#### Esthetic evaluation tool for plastic surgery procedure. A pilot study

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<sup>1</sup>Marseille/France, <sup>2</sup>Toulon/France, <sup>3</sup>Aix En Provence/France

**Aim:** Esthetic requirements are the main indication for root coverage surgical procedures. The aim of the methodological study presented was to develop and validate an accurate aesthetic professional index, designed to assess periodontal plastic surgical procedures.

**Material and Methods:** Seven expert periodontists, were selected. Four of them realized root coverage surgical procedure of 30 class I and II gingival recessions, by an envelope or a tunnel technique, in 30 patients. The three other periodontists were observers. They analysed the results on pictures 3 months after surgery with the esthetic tool proposed, based on 4 visual criteria : thickness, color, texture and visible scarring. Inter and intra-observer reliability was performed using kappa coefficients.

**Results:** The intra-observers coefficients were from moderate to excellent agreement. The assesment of the thickness appears to be the less reliable. The inter-observers coefficients were poor or very poor agreement.

**Conclusion:** This professional esthetic index can be used by the periodontist immediately after surgery and at each stage of reassessment.

Topic: Periodontal plastic surgery

**P0871**

### Stabilisation with cyanoacrylate decreases shrinkage of free gingival grafts.

P. Gümüş, E. Buduneli

Izmir/Turkey

**Aim:** Free gingival graft is the most frequently used technique in mucogingival surgery to increase attached gingiva. The aim of the present study was to evaluate the amount of graft shrinkage with three different stabilization methods of free gingival graft.

**Material and Methods:** Forty five patients were included in three study groups; stabilisation with conventional technique, cyanoacrylate and microsurgery techniques. Plaque index, papilla bleeding index, probing depth and clinical attachment level were recorded by a periodontal probe. Keratinized tissue width, graft area, gingival recession were all calculated by a specific software on standard photographs taken at baseline, 1-, -3, and 6-month follow-ups. Duration of surgery was also recorded. Pain in both recipient and donor sites was assessed using Visual Analogue Scale within the first week after surgery.

**Results:** All clinical periodontal parameters showed similar changes in the three groups. The change in the keratinized tissue width was also similar in the study groups at all times. Graft shrinkage was significantly less ( $p < 0.05$ ) in the cyanoacrylate group than the other groups whereas those in the conventional and microsurgery groups were similar. Significantly less pain in the recipient site was reported by the patients in the cyanoacrylate group ( $p < 0.05$ ). Duration of surgery was also significantly less in the cyanoacrylate group than the other groups ( $p < 0.05$ ).

**Conclusion:** Less graft shrinkage in free gingival grafts together with shorter surgery time and less pain in the recipient site obtained in the cyanoacrylate group suggest that cyanoacrylate can be preferred as the stabilisation technique for free gingival grafts.

Topic: Periodontal plastic surgery

**P0872**

### TREATMENT OF MILLER CLASS III MULTIPLE GINGIVAL RECESSIONS: DISCUSSION ON RISK FACTORS FOR COVERAGE PREDICTIBILITY

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<sup>1</sup>Rabat/Morocco, <sup>2</sup>Bern/Switzerland, <sup>3</sup>Szeged/Hungary, <sup>4</sup>Paris/France

**Aim:** Twenty healthy subjects from the Aroca & al. study with at

least three adjacent Miller class III gingival recessions on both sides of the maxillary or mandibular arch, were enrolled for the trial in a university periodontal clinic. The purpose of our presentation is to discuss the risk for the 139 treated sites of not obtaining a full root coverage at 28 days with a coronally advanced modified tunnel (CAMT) technique in combination with a connective tissue graft, with or without enamel matrix derivative (DMA) (Aroca et al, 2010), according to the following clinical parameters:

**Material and Methods:** Plaque Index (PI) (Löe, 1967), Gingival Index (GI) (Löe and Silness, 1963), probing depth (PD), gingival recession (REC) and clinical attachment level (CAL). Additionally, the width of the keratinized gingiva (KGW), the width of the recession defect (RW) and the distance between the contact point and the top of the papilla at the mesial aspect of the tooth (DCP) were recorded. PD, REC, CAL, KGW measurements were made at the mid-buccal point of the teeth involved. At 28 days, only the measurements for REC and DCP were recorded.

**Results:** We found no complete root coverage in 23% of sites at 28 days without any difference between test and control groups. There was a tendency for DCP but no statistically significant association was noted.

On 29 sites (49%) for test group (DMA) and 26 sites (43%) for control, full root coverage (FC) was not obtained. Differences were not statistically significant. On pooled data there was a trend, but not statistically significant between lack of FC and DCP.

**Conclusion:** Based on these data, clinical cases will illustrate the clinical parameters which may have an incidence on incomplete root coverage.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0873**

### The relationship of gingival biotype and crown morphology among Malay ethnicity in Malaysia

E. Ariffin, F. Al-Bayat, N.B. Abd Wahab, N.S. Salim

Shah Alam/Malaysia

**Aim:** To determine the association between different gingival biotypes and crown morphology among Malay ethnicity.

**Material and Methods:** The study was conducted with 42 periodontally healthy and consented Malay volunteers aged 18 to 29 years old. They were grouped into thin and thick gingival biotypes. Gingival biotype of each participant was done by probing into the midfacial of gingival margin of upper central incisors. If the probe was visible, it would be considered as thin and if the probe was invisible, it would be categorized into thick gingival biotype. The measurements of the crown length (CL) and crown width (CW) were done to determine the shape of the crown of tooth 11 and 21. The ratio of CW/CL for tooth 11 and 21 was calculated and the means CW/CL of the teeth were compared between thin and thick gingival biotype groups. The statistical analysis was done Mann Whitney Test of SPSS version 17.0.

**Results:** The results from this study showed that the mean CW/CL ratio for thick and thin gingival biotypes at tooth 11 and 21 were 0.803 and 0.751. The  $p$ -value for the difference was 0.153.



**Conclusion:** This study concluded that there was no significance difference in the morphology of the crown of 11 and 21 in relation to thickness of the gingiva among Malay ethnicity in Malaysia.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0874

### Root coverage procedure for the treatment of localised gingival recession in a patient with Ehlers-Danlos syndrome: A case report

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<sup>1</sup>Kuala Lumpur/Malaysia, <sup>2</sup>London/United Kingdom

**Aim:** Ehlers-Danlos syndrome is a group of heterogeneous connective tissue disorder characterised by deficiencies of collagen-processing enzymes, dominant-negative effects of mutant  $\alpha$ -chains and haploinsufficiency.

**Material and Methods:** Case report:

A 27 year-old white male with Ehlers-Danlos Syndrome presented clinically with several localised gingival recessions. Patient had a history of orthodontic treatment with orthognathic surgery with no associated problem. A root coverage procedure was carried out on tooth 23. Partial thickness flap was raised 1 mm away from the gingival margin of tooth 23 extending to the distal of tooth 26. Mesially transposed pedicle flap was done to achieve root coverage of tooth 23. Enamel matrix derivative (EMD, active component of Emdogain®; Straumann, Basel, Switzerland) was applied on the denuded root surface. The graft was stabilised with multiple single interrupted sutures at the level slightly coronal to cemento-enamel junction. There was improvement in attachment level and keratinised gingiva up to 3months. The initial recession was 6 mm. Optimum root coverage was achieved.

**Results:** Discussion:

EMD was used to support the root coverage attempt of the mesially transposed pedicle flap in this patient based on the result from the recent Cochrane systematic review by Chambrone et al. 2010 which indicates significant greater gain in keratinised tissue for EMD as opposed to coronally advanced flap alone.

**Conclusion:** : Within the limit of this case report, a periodontal plastic procedure with EMD could predictably achieve root coverage in a patient with Ehlers-Danlos Syndrome.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0875

### Management of a 19-years old female necrotizing ulcerative gingivitis patient by an aesthetic approach

S. Arslan, A. Doğan

Ankara/Turkey

**Aim:** Introduction Necrotizing ulcerative gingivitis (NUG) is

an acute, destructive disease that results in interdental papilla loss. Microflora including cocci, fusiform bacilli, spirochetes are suspected to play important role in etiology of NUG. Emotional stress, smoking, malnutrition, immunosuppressive conditions such as HIV infection are predisposing factors. Clinically NUG is characterized by spontaneous bleeding, pain, halitosis, pseudomembrane, crater-like ulcerations on papillae. Owing to interdental papilla loss on gingival margin, an irregularity occurs. Because of this NUG patients often suffer from aesthetic problems. After initial anti-inflammatory therapy, gingivectomy, gingivoplasty and other surgical operations may help to resolve aesthetic problems.

**Material and Methods:** Case report Here we present a 19-years old female NUG patient who suffers from gingival bleeding, pain and halitosis. In clinical examination there was pseudomembranes, ulcerations, spontaneous and provoked bleeding. After initial therapy including oral hygiene instructions, mechanical debridement of supra and subgingival calculus and gingival curettage a rapid healing progress is observed. Two weeks later, infection was mostly treated. However, irregularity on the gingival margin related to papilla loss was an important problem for the patient. Gingivoplasty and gingivectomy procedures are applied and favorable aesthetic outcome is obtained.

**Results:** Favorable aesthetic outcome is obtained after surgical procedures

**Conclusion:** Anti-inflammatory treatment is vital for resolving infection. Papilla loss related to NUG may produce important aesthetic problems. Simple surgical procedures such as gingivectomy and gingivoplasty may be helpful to overcome these difficulties.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0876

### Orthodontic reduction of class IV gingival recession

N. Stawińska

Wrocław/Poland

**Aim:** Class IV recession surrounding the tooth is used to be a difficult clinical problem to solve only by periodontist. Intradisciplinary team treatment could be a valuable solution and an alternative.

**Material and Methods:** 49-year-old woman visited orthodontic office concerned about her elongated second incisor. Because of local abscess and generalized periodontitis the patient has been referred to periodontist. After full-mouth root planning procedures, an inflammation was reduced so orthodontic treatment could be started. Segmental arch technique with a big respect to biomechanical rules resulted in tooth intrusion and replacing the root into alveolus. The whole process was documented radiographically. The spectacular aesthetic improvement just after treatment was registered on clinical photos. 6-year post treatment evaluation let us observe that about half of initial class IV recession still has been covered.

**Results:** From orthodontic point of view, important seems to mention that tooth intrusion cannot be achieved with straight wire mechanic. Surgical management of vertical bone defect after orthodontic treatment was refused by patient for economic reason. Rational might be an expectation that hard tissue support for the soft one could be an important factor to increase long term stability of obtained class IV recession reduction.

**Conclusion:** Professional and tight perio-ortho association is essential to expand and spread a range of clinical service. Orthodontic support is a challenging approach in creating positive soft tissue architecture in some periodontally hopeless cases.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0877

### Platelet Rich Fibrin: a Novel Approach for the Treatment of Miller Class 1 and 2 Gingival Recessions

Y. özat, B. Doğan, G. Torumtay

Isparta/Turkey

**Aim:** Introduction: Based on our current understanding from clinical trials, connective tissue graft (CTG) remains the gold standard through clinical success and predictability regarding the treatment of gingival recessions, although secondary surgical site necessity stands with relatively postoperative discomfort. Platelet rich fibrin (PRF), is an autologous leukocyte and platelet rich fibrin matrix in which the platelet derived cytokines and cells are trapped and released for at least 7 days post-operatively. This novel promising material is considered to promote early healing of extraction sockets in particular. Due to recombinant growth factors, PRF is a potential tool for enhanced tissue repair and hard and soft tissue healing. Clinical utilisation of PRF flourishes as an attending issue on the treatment of gingival recessions.

**Material and Methods:** Case report: These case reports were designed to evaluate the effect of PRF membrane as an alternative to CTG on root coverage procedures for Miller class 1 and 2 recessions. Eight otherwise healthy patients with bilateral Miller Class 1 and/or 2 recessions who had radiographically no evidence of interproximal bone loss were recruited and a split-mouth design was considered regarding treatment with PRF only and treatment with CTG and coronally positioned flap.

Clinical parameters including periodontal probing depth, clinical attachment level, gingival recession and bleeding on probing were measured at baseline, 1-month follow-up and 3 months follow-up.

**Results:** Preliminary results look promising and no adverse reactions have been seen. Detailed results and comparisons will be provided on the poster.

**Conclusion:** Larger scale randomized controlled trials are required to substantiate these results.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0878

### Is Platelet Rich Fibrin (PRF) an Alternative Option for Treating Multiple Gingival Recessions?

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Bahçelievler/Turkey

**Aim:** INTRODUCTION: Clinical outcomes, and intra- and

post-operative technique related variables of PRF with coronally advanced flap (PRF+CAF), connective tissue graft with CAF (CTG+CAF), or CAF alone in multiple Miller Class I and II gingival recessions were evaluated in this case series.

**Material and Methods:** CASE REPORT: At baseline, mean gingival recession was 0.86 mm for PRF+CAF and 1mm for CAF alone sites in Case I, 1mm for PRF+CAF and 1.16 mm for CTG+CAF sites in Case II, and 1.58 mm for PRF+CAF and 1.83 mm for CTG+CAF sites in Case III. All treatments were effective in providing a significant reduction of the baseline recession but mean recession reduction was not statistically different between the two sites of all cases. Greater complete root coverage was achieved for CTG+CAF (75%) compared to PRF+CAF (42%) in Case III. The results were the same (26% and 17% for both sites) in Case I and II, respectively. Surgical time was significantly shorter for PRF+CAF compared to the CTG+CAF, and similar with CAF alone sites. Postoperative side effects were minimal for PRF+CAF and CAF alone sites. The difference observed between the methods for keratinized tissue gain and residual probing depths were not statistically significant.

**Results:** DISCUSSION: There is need for further randomized-controlled clinical studies of PRF procedures in comparison to common surgical periodontal plastic procedures.

**Conclusion:** The results of the present study for the use of PRF in combination with CAF in gingival recessions are controversial.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0879

### Definition, dimension and prevalence of gingival biotypes

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**Aim:** The aim of this systematic review was to evaluate the existing literature on the definition, of patient's biotype(s), its dimensions and prevalence. Proper diagnosis of the gingival biotype is considered to be of impact on decisions in esthetic and implant dentistry.

**Material and Methods:** The MEDLINE-PubMed, the Cochrane-CENTRAL and EMBASE databases were searched through June 2011 to identify any appropriate study that addressed the aim of the review.

**Results:** From independent screening of the unique titles and abstracts of 109 MEDLINE-PubMed, 1083 Cochrane-CENTRAL and 494 EMBASE papers publications were selected that provided definitions with respect to gingival biotype. The criteria used to discern between different biotypes appeared to be based on either tooth biotype, on tissue biotype or on the combination of both. For example the following parameters were used in order to categorize the patient's biotype: direct visual assessment or measurement of crown width/length ratio, gingival thickness, width of the keratinised gingiva, probing depth and papilla height. Traditionally biotypes are assessed visually into a 'thin-scalloped' or a 'thick-flat' biotype. The most commonly used dimension to separate between 'thin' and 'thick' gingival biotype is an arbitrary chosen 1.0 mm thickness of the marginal gingiva, this seems arbitrary. Reported prevalences for thin tissue type varied from 15 up to 50%, dependent on the assessment method used.

**Conclusion:** Prevalence of thick gingival biotypes seems to be higher than thin biotypes, however this depends on the definitions and the methodology used.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0880

### Root coverage using commercially available collagen tissue matrix – a case report

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**Aim:** Introduction: The indications for mucogingival periodontal surgery have increased in recent years as did the patient awareness regarding aesthetics and function. Gingival recessions do not require mucogingival surgery unless there is constant inflammation, poor aesthetics, hypersensitivity or orthodontic reasons. The goal of the mucogingival surgery is mostly to cover recession.

**Material and Methods:** Case report: Patient D.B. (male, 31 y) has been diagnosed with a facially localized 6 mm wide Miller class II gingival recession on a left lower incisor. Two-phase surgical treatment was recommended. In first phase free gingival graft (FGG) 10 mm long, 5 mm wide was harvested from the palate and placed at the recipient site 1.5 mm apical to the gingival margin. Two years later in the second stage surgery coronal repositioning and soft tissue augmentation was performed using commercially available collagen tissue matrix derived of animal dermis mucoderm® (botissdental GmbH, Berlin, Germany), thus avoiding a second surgery at the palate.

**Results:** Discussion and **Conclusion:** Six months later attachment level and keratinized gingiva have been significantly broadened. Initially absent keratinized gingiva was now 6 mm wide and gingival recession was reduced from 6 mm to 1 mm.

**Conclusion:** Aesthetic results are satisfactory, ensuring that the patient performs trauma-free oral hygiene procedures.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0881

### Coronally Advanced Flap in Combination with Acellular Dermal Matrix Allograft : CASE SERIES

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Istanbul/Turkey

**Aim:** Gingival recession (GR) is a common concern for which several treatment options are available. The main indications for root coverage procedures are esthetic demands and root hypersensitivity. There are many surgical techniques for the treatment of GR. Acellular Dermal Matrix Allograft (ADMA) have become a good alternative to autogenous soft tissue grafts.

**Material and Methods:** ADMA with Coronally Advanced Flap (CAF) technique was applied in 4 cases. Probing depth, attached gingiva width, clinical attachment level and gingival recession depth were measured and clinical photographs were taken at baseline, 6 months and 1 year. Patients were followed at 10 days, 1 month, 3 months, 6 months and 1 year.

**Results:** Surgical techniques are laterally positioned flap, double papilla flap, coronally advanced flap (CAF), semilunar coronally advanced flap, free gingival graft, subepithelial connective tissue graft (CTG) and guided tissue regeneration. Best results can be achieved with subepithelial connective tissue grafts but this technique needs second surgery site. Acellular dermal matrix allograft (ADMA) can be the option in generalized gingival recessions where there is lack of CTG. Root coverage, clinical attachment gain, increased width of attached gingiva, no donor site need and good esthetic results are the advantages of ADMA.

**Conclusion:** The combined technique has acceptable clinical aesthetic results. Treatment outcomes the aesthetic demands and eliminated the root hypersensitivity with no donor site.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0882

### Six-month Follow-up Treatment of a Hopeless Tooth with Two-step Procedure Involving Intentional Replantation and Free Gingival Graft

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Kirikkale/Turkey

**Aim:** To demonstrate a mucogingival therapeutic approach following an IR procedure.

**Material and Methods:** A 20-year-old female patient was referred to the clinic with severe destruction and malposition in her tooth #32. The endodontic treatment of the tooth completed 1 week before the operation. Then, the tooth was treated with IR procedure and splinted to the adjacent teeth at its desired position. Following 3 months of healing, the amount attached gingiva was insufficient and a mucogingival surgery was planned as a second step treatment. Then, FGG was harvested from palate and placed in region of tooth #32.

**Results:** At her 4-week and 3-month visits, the gingiva was firm, pink and there was no bleeding on probing. Increased amount of attached gingiva was obtained at the surgical site. Radiographic evaluation revealed no root resorption and pathology around alveolar bone. Patient was satisfied with outcomes of the treatment.

**Conclusion:** Mucogingival surgery should be thought as a successful supportive alternative following IR procedure.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0883

### Two stage treatment of multiple Miller Class I gingival recessions using double papilla flap and coronally advanced flap with acellular dermal matrix procedures: A case report.

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Istanbul/Turkey

**Aim:** Gingival recession (GR) is a common problem which can cause aesthetic problems and root hypersensitivity. There are various surgical techniques for the treatment of GR. Coronally advanced flap (CAF) with acellular dermal matrix allograft (ADMA) is shown to be an effective method and has advantages such as no donor site need and good esthetic results.

**Material and Methods:** A 45 year-old female with multiple Miller Class I gingival recession defects in the upper jaw referred for evaluation and treatment. DPF was applied for left central incisor. Lack of attached gingiva and relatively higher recession depth were the reasons to prefer DPF prior to CAF with ADMA application. 6 months later, CAF with ADMA was performed on the multiple defects. Several parameters such as gingival recession depth (RD), attached gingiva width (AGW), clinical attachment level (CAL) and probing depth (PD) were measured and clinical photographs were taken at baseline, 3 months and 6 months following surgeries. Complete root coverage was achieved in four of six defects.

**Results:** Several techniques were defined for root coverage. The limited amount of subepithelial connective tissue and a donor site need were the reasons to prefer ADMA for the treatment of multiple recession defects. Aesthetically satisfying results have been achieved.

**Conclusion:** CAF with ADMA is a predictive method for root coverage. Several root covering techniques can be used for specific defects individually. The combination of different techniques can be used in an order to achieve better results.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0884

### Treatment of a Canine Tooth with Deep Periodontal Defect and Gingival Recession by Using Platelet-Rich Fibrin in combination with a Two-step Mucogingival Surgical Procedure

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**Aim:** To present treatment of a canine tooth with localized, deep periodontal defect and gingival recession by using PRF in conjunction with two-step mucogingival surgery.

**Material and Methods:** A 28-year-old male was referred to the clinic with complaint of gingival recession and swelling at his

tooth #23. In the clinical examination, bleeding on probing, pus formation, slight edema, redness were observed. 4 mm of gingival recession in midbuccal site and deep probing depths (12, 8, 10 mm in mesial, median, distal surfaces, respectively) were also detected. At first step, coronally advanced flap by adding a PRF gel was performed and an improved soft tissue healing was observed in the early postoperative call. At his 6 month visit, clinical examination revealed shallow periodontal pockets and complete defect fill was observed according to his radiographic evaluation. However, 4 mm residual recession was present in mid-buccal root surface. Then, a second step treatment including a laterally positioned flap in combination with a free gingival graft was performed to treat the residual recession.

**Results:** Satisfactory periodontal healing with complete root coverage and periodontal pocket elimination was obtained at 6 months follow-up.

**Conclusion:** It was noticed that PRF may have significant contribution to early soft tissue healing, periodontal defect fill and root coverage and should be thought as an adjunct in the treatment of complicated periodontal defects.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0885

### Microsurgical reconstruction of lost interdental papillae with wedged epithelio-connective grafts: technical considerations and a series of cases.

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**Aim:** Loss of papillae as result of trauma or inflammatory periodontal disease creates a significant challenge in the esthetic zone. More and more sophisticated approaches for reconstruction have been proposed (Han & Takei 1996, Carranza & Zogbi 2011, Nordland et al. 2008).

**Material and Methods:** This is a series of 3 cases with 9 papillae lost because of periodontal disease. Measurements from interdental contact point to the actual papilla tip were made. The crest of the interdental septum has been detected by radiographs and bone sounding. An incision reaching the bone 1mm apically from the septal crest was performed with microsurgical scalpel, in form of a pouch, carefully avoiding the complete transversal separation of the papilla. The pouch was enlarged in coronal direction with papillar elevators. An epithelio-connective wedge of palatal tissue was harvested and separated under microscope in triangular pieces, which were shaped, wedged into the pouches, stabilized with vertical positioning sutures and secured with mattress microsurgical sutures. Healing was uneventful, no graft was lost, after 6 months an average papilla height gain of 1.7 mm was achieved.

**Results:** This technique is a significant simplification of the pouch-and-tunnel technique described by Azzi et al. (2009) and is destined to medium-size losses of interdental papillae with initial papilla width at the base of at least 3 mm. It avoids vertical incisions, but requires precision and pondering of initial incisions, to avoid transversal severing of the papilla. The procedure can be repeated.



**Conclusion:** The technique described is simple and immediately effective. Due to the epithelial component of the graft, results in perfect esthetic matching with surrounding gingiva. Stability in time of achieved papillar height remains to be evaluated in subsequent studies.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0886

### The Effect of Platelet Rich Plasma on the Clinical Results of Coronally Advanced Flap Root Coverage Procedure

M. Hanzade, H. Alpay Yavuz, O. Karakas, E. Aydin, A. Efeoglu  
Istanbul/Turkey

**Aim:** Coronally advanced flap (CAF) has been shown to effectively treat gingival recession. Platelet-rich plasma (PRP), containing autologous growth factors, has been shown to promote soft tissue healing; therefore, the purpose of this study was to evaluate the effects of PRP in combination with CAF.

**Material and Methods:** 15 systemically healthy patients with buccal Miller's Class I recession defects was participated in this study. Total number of treated recession defects was 70. Sites to be treated were randomly assigned into study (CAF + PRP) and control (CAF) groups. Clinical parameters included recession depth (RD), recession width (RW), gingival thickness (GT), width of keratinized tissue (KTW), clinical attachment level (CAL), probing depth (PD), plaque index (PI) and gingival index (GI) was recorded prior to surgery. PRP was prepared from 30 ml whole blood, drawn before the surgery and applied to root surfaces in the operation area. Patients were followed at 10 days, 6 weeks, 3 months and 6 months post-surgery.

**Results:** No statistically significant differences were observed between treatment groups in RD, RW, GT, KTW, CAL, PD, PI and GI.

**Conclusion:** Based on the results of this randomized controlled study, the application of PRP in CAF root coverage procedure provides no clinically measurable enhancements on the final therapeutic outcomes of CAF in Miller's class I recession defects.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0887

### Assessment of the individual biological width height in crown lengthening procedures performed on a healthy periodontium

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**Aim:** Breaking through the biological width by inserting subgingival or overcontoured prosthetic limits leads to the occurrence of periodontal complications. In order to prevent

these complications, a crown lengthening procedure must be performed. This periodontal surgery consists in moving the soft tissues – which are adherent to the tooth and coronal to the bone crest – apically.

**Material and Methods:** Through a clinical case we will show the interest to determinate the individual height of the biological width prior a crown lengthening. Under local anaesthesia, the height including the biological space and the sulcus is measured by probing to the bone crest at sites concerned by the surgery. The obtained measure will be moved apically to the cervical limit of the prosthetic preparation. The definite height corresponds to the distance separating the prosthetic limit to the bone crest.

**Results:** Too often, crown lengthening procedures are performed based upon a unique average height of the biological width, while one of the main features of this space is the wide range of variability of its dimensions among subjects and between the different teeth of a same subject as well. Prior to performing any crown lengthening procedure, it is essential to determine the individual height of the biological width for each involved (tooth) site.

**Conclusion:** This careful and customized periodontal preparation allows to improve the periodontal status, and to ensure a long term, stable, functional and aesthetic outcome.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0888

### Aggressive periodontitis: the role of free gingival graft in the treatment of aggressive periodontitis before orthodontic treatment

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Casablanca/Morocco

**Aim:** Aggressive periodontitis is characterized by rapid loss of clinical attachment and alveolar bone and normally affect young adults (AAP 1999). The amount of biofilm and calculus accumulation in aggressive periodontal subject is inconsistent with the severity and progression of the periodontal destruction. The gingival recession is a form of periodontal destruction in aggressive periodontitis.

**Material and Methods:** Keratinized tissue augmentation with free gingival graft is used procedure in our case report in the treatment of gingival recession before orthodontic treatment (Wennstrom 1996). Monitoring demonstrated that the results for our clinical cases are maintained in the medium and long term.

**Results:** the use of free gingival graft as treatment against the aggravation of gingival recession is relevant in the preparation of the dentition for orthodontics treatment (Wennstrom 1990). This technique should result in an increase of the apicocoronal and buccolingual dimension of the gingival tissues and in the establishment of proper vestibular depth where necessary (Camargo and al 2001).

**Conclusion:** the aim of this work is to examine the clinical application of the free gingival graft in the preparation before orthodontic treatment for patient with aggressive periodontitis.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0889**

### Factors limiting treatment outcomes of gingival recession: Application of Zucchelli's method to predetermine the line of root coverage

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**Aim:** Introduction: In what concerns to root coverage, several surgical procedures have been published. Although there is a big heterogeneity of results, some techniques have been reported to be more predictable than others. However, even those techniques rarely achieved 100% complete root coverage, as it would be desired. In the last years these incomplete successes have been attributed, in Miller class I and II, to the inter-operator variability and/or to the technique sensibility. In 2006, Zucchelli et al. suggested that the incomplete root coverage could be due to an incorrect selection of the case or to the inadequate use of some referring measurement parameters, rather than to the listed criteria. The authors proposed a new method which seems to be able to predetermine the final position of the soft tissue margin after a mucogingival surgical procedure.

**Material and Methods:** Case report: ten clinical cases have been selected in which root coverage of Miller class I and II has been performed. The technique proposed by Zucchelli et al. was applied to the initial photos and, based on the outcomes, the applicability and feasibility of the technique were evaluated.

**Results:** Discussion: The method proposed by Zucchelli et al., allowing the predetermination of the final level of the soft tissue margin, assures a better prevision of the outcomes, facilitates the doctor-patient communication and guarantees a better interdisciplinary between Perio-Protheses or Perio-Dentistry which will provide an optimized aesthetic result.

**Conclusion:** the selected ten clinical cases corroborate the utility and the predictability of this method.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0890**

### Keratinized Soft Tissue Enhancement Around Implants: Report of a Case

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**Aim:** Lack of periodontal ligament between alveolar bone and implant surface makes periimplant tissues weaker than natural dentition and it accelerates destruction progress around implants. Alveolar mucosa doesn't protect periimplant tissues. On the other hand, attached gingiva and palatal keratinized masticatory mucosa is immobile and it protects natural dentition

or periimplant tissues. This kind of tissue is more preferred than mobile mucosa. Therefore the width of attached gingiva has an important role for implants. Absence of attached gingiva around dental implants may cause fast bone resorption and periimplantitis. Sufficient width of keratinized tissue around dental implants prevents the destruction of tissues and improves the long time success. Various mucogingival surgery procedures are used to achieve or increase the width of keratinized tissue around implant area. The purpose of this study is to enhance keratinized soft tissues on the buccal side of implants with periodontal plastic surgery.

**Material and Methods:** Six months after insertion of implants in left maxillary and right mandibular molar region, the soft tissue around implants was evaluated. Mobile alveolar mucosa was observed on the buccal side. Horizontal and releasing incisions were made up to the mucogingival junction and partial thickness flap was elevated. Afterwards, flap positioned buccally and sutured. A week after the surgery, sutures were removed, soft tissues evaluated during three weeks.

**Results:** On maxillary region seven millimeters and mandibular region three millimeters keratinized tissue was observed.

**Conclusion:** Due to the importance of sufficient keratinized soft tissue for implant success, it was enhanced on the buccal side of both implants.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

**P0891**

### The rough surface coverage of an implant with rotated palatal flap

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**Aim:** Background: Despite the need for keratinized tissue for the maintenance of dental implants has been controversial, the preservation and/or the reconstruction of keratinized tissue around dental implants may be advocated to facilitate restorative treatments, to improve aesthetics and plaque control during oral hygiene. In this case report, the reconstruction of keratinized tissue to cover the rough surface of an implant was performed with rotated palatal flap.

**Material and Methods:** A 55 year-old patient presented with lack of keratinized tissue around an implant in left maxillary posterior region. Also the plaque retention was observed due to exposed rough surface of implant. Pediculated palatal connective tissue graft (PPCTG) was mobilized and easily rotated in the direction of implant. PPCTG rotated to cover buccal rough surface of the implant and sutured under the buccal flap.

**Results:** Three months after treatment, the rough surface was completely covered with keratinized tissue. A new restoration will be placed. The patient can easily make plaque control around the implant.

**Conclusion:** Reconstruction of keratinized tissue with rotated palatal flap is a possible method in maxilla.

Topic: Clinical Tips and cases: Aesthetics and periodontal plastic surgery

## P0892

### Comparison between micro and macrosurgical techniques for root coverage, using coronally positioned flaps associated to enamel matrix derivative: 12-month clinical evaluation.

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Ribeirão Preto/Brazil

**Aim:** The purpose of this study was to compare the micro and macrosurgical techniques for root coverage, using coronally positioned flap associated to enamel matrix derivative (EMD), after 12-month clinical evaluation.

**Material and Methods:** Thirty patients selected for the treatment of gingival recessions with the technique of coronally positioned flap associated to EMD, were randomly assigned to test group (TG: 15 patients) or control group (CG: 15 patients). A microsurgical approach and the conventional macrosurgical technique were performed in the TG and CG, respectively. The clinical parameters evaluated before the surgeries and after 12 months were: gingival recession (GR), probing depth (PD), relative clinical attachment level (RCAL), width of keratinized tissue (WKT), and thickness of keratinized tissue (TKT).

**Results:** There were no statistically significant differences between the groups for all parameters at baseline. At 12 months, there was no statistically significant difference between the techniques with regard to reduction in gingival recession height, however, there was a statistically significant difference in relation to increase in the WKT, favoring the TG.

**Conclusion:** Both techniques provided significant root coverage, but the microsurgical approach demonstrated better results for the increase in the WKT.

Topic: Periodontal regeneration

## P0893

### Present New Suture able and Biodegradable synthetic Membrane for GBR

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**Aim:** Compare the use and treatment effects of new synthetic membrane with Bio guide membrane in Patients with two groups contains: group 1: with Bifurcation involvement (type 3=Through & through ) Group2: patient that after preparation the sit for implant fixture will have dehiscence

**Material and Methods:** In this study we have two groups patients (30 group one-45 group two) group 1: with Bifurcation involvement (type 3=Through & through ) Group2: patient that after preparation the sit for implant fixture will have dehiscence In this study compare Bioguide Membrane with new Membrane, in this study bone substitute was Allograft (ITB). The Patients have after one ,two weeks follow up and 1, 2 and 3 months with photo -Periodontal Probe and RVG(defragment technique)

**Results:** For photo result we used nonparametric (related samples)-for Probe deep compare means (paired samples T Test ) and for defragment RVG compare means (independent T Test). P value was< 001.(P

**Conclusion:** In this study we found three effect compare to Bio Guide consist: 1)The new membranes were user friendly because very strong and resistance to rapture (suture able) 2)The new Membrane compare to the Bio guide have good attachment to bone substitute and don't move after gingival retraction. 3) Coverage the around the implants and bifurcations very good and in defragment RVG, results were good . Finally the new membrane should be use in socket preservation and then when implant should be insert we can trephine the bone and cut the gingiva and survey the histopathological samples.

Topic: Periodontal regeneration

## P0894

### Oral Decontamination and Bone Regeneration Through Definitive Sanative Therapy

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Fonthill/Canada

**Aim:** Clinicians are constantly inundated by novel options to treat periodontitis. Lasers, photodynamic approaches, irrigation and the local delivery of antibiotics are approaches that are heavily marketed to aid the clinician in treating patients with periodontal lesions. Soft tissue management programs designed by practice management consultants are also used in general practices as a blanket approach for patient care. None of these approaches or options is effective for the patient if the clinician loses sight of the fundamental underlying pathophysiology of periodontal disease. The removal of local factors must be achieved to facilitate resolution of the inflammation..

**Material and Methods:** Definitive sanative therapy was provided by experienced hygienists using loupes, brilliant illumination, carefully sharpened instruments, adequate anaesthesia, and enough time to complete initial therapy. In this case series we report on the efficacy of spending approximately 5-7 minutes of time per tooth for instrumentation for initial sanative therapy, and 2 minutes per tooth for regular periodontal prophylaxis. Crestal bone height, attachment levels and plaque scores were measured at baseline and at each periodontal prophylaxis appointment over an average observation period of 36 months.

**Results:** By providing definitive oral decontamination and individualized periodontal maintenance, there is a measurable improvement in attachment levels and crestal bone height.

**Conclusion:** The effective removal of local factors is a fundamental step, in returning the patient to stable periodontal health. This step is facilitated through the use of properly sharpened instruments, assisted-vision, adequate anaesthesia and above all, enough time to complete the treatment.

## Topic: Periodontal regeneration

**P0895****A Systematic Review of the Use of Growth Factors in Human Periodontal Regeneration**

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Parkville/Australia

**Aim:** To carry out a systematic review of human studies using growth factors for periodontal regeneration and to compare the efficacy of these growth factors compared to other accepted techniques for periodontal regeneration.

**Material and Methods:** An electronic and manual search based on agreed search phrases between the primary investigator and a secondary investigator was carried out to identify the use of growth factors in periodontics. The articles that were identified were analysed in detail, which included the study of their inclusion and exclusion criteria, outcome measures determination and analysis, risk of bias, adverse events and conclusions or inference of the efficacy of growth factors to the general population.

**Results:** Nine papers fulfilled the inclusion criteria. Most of the reported outcomes were descriptive. The articles demonstrated periodontal regeneration was at least comparable to their respective positive controls with only a couple articles demonstrating significantly greater outcomes compared to their respective positive controls. Histological evidence demonstrated greater periodontal regeneration when using growth factors compared to other regenerative technique and also demonstrated an increased healing rate and bone maturation rate compared to other regenerative in these human studies.

**Conclusion:** The use of rhPDGF-BB led to greater CAL gain of around 1mm compared to an osseointegrative control,  $\beta$ -TCP. The use of rhPDGF-BB led to greater percentage bone fill of around 40% compared to an osseointegrative control,  $\beta$ -TCP. The use of rhPDGF-BB led to an increased rate of bone growth of around 2mm compared to an osseointegrative control,  $\beta$ -TCP.

## Topic: Periodontal regeneration

**P0896****The effects of enamel matrix derivative in combination with bone swaging and calcium phosphate bone cement on periodontal regeneration in 1-wall intrabony defects in dogs**Y. Shirakata<sup>1</sup>, T. Yoshimoto<sup>1</sup>, N. Takeuchi<sup>1</sup>, K. Taniyama<sup>1</sup>, A. Sculean<sup>2</sup>, K. Noguchi<sup>1</sup><sup>1</sup>Kagoshima/Japan, <sup>2</sup>Bern/Switzerland

**Aim:** The aim of the present study was to evaluate the effects of enamel matrix derivative (EMD) in combination with bone swaging (BS) and injectable calcium phosphate bone cement (CPC) on periodontal healing in one-wall intrabony defects in dogs.

**Material and Methods:** One-wall intrabony defects (3mm wide and 5mm deep) were surgically created on the mesial and distal sides of bilateral mandibular fourth premolars in four dogs. The 16 defects were assigned to one of the following treatments: EMD, BS, EMD with BS (EMD/BS) and EMD with BS and CPC (EMD/BS/CPC). The animals were sacrificed at 8 weeks after surgery for histologic evaluation.

**Results:** The height of newly formed bone was significantly greater in the EMD/BS/CPC group ( $3.73 \pm 0.30$  mm) than in the BS ( $2.74 \pm 0.33$  mm;  $P < 0.05$ ) and EMD/BS ( $2.88 \pm 0.98$  mm;  $P < 0.05$ ) groups. The area of newly formed bone in the EMD/BS/CPC group ( $5.68 \pm 1.66$  mm<sup>2</sup>) was significantly greater than in the EMD ( $3.68 \pm 0.33$  mm<sup>2</sup>;  $P < 0.05$ ), BS ( $3.48 \pm 1.26$  mm<sup>2</sup>;  $P < 0.05$ ), and EMD/BS ( $3.38 \pm 1.37$  mm<sup>2</sup>;  $P < 0.05$ ) groups. The EMD ( $4.63 \pm 0.42$  mm), EMD/BS ( $4.67 \pm 0.30$  mm) and EMD/BS/CPC ( $4.78 \pm 0.54$  mm) groups showed significantly greater cementum formation than the BS group ( $3.93 \pm 0.56$  mm;  $P < 0.05$ ).

**Conclusion:** These results indicate that EMD/BS/CPC treatment effectively promotes periodontal regeneration in one-wall intrabony defects in dogs.

## Topic: Periodontal regeneration

**P0897****Enamel matrix derivative proteins in the treatment of intra-bony defects : a report of 32 consecutive cases**

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**Aim:** The aim of this study was to evaluate the efficiency of enamel matrix derivatives (EMD) treatment in intra-bony defects on a series of consecutive cases and to identify the principal risk factors responsible of the variability of the results.

**Material and Methods:** After ultrasonic debridement, 52 residual pockets belonging to 32 patients were treated surgically using EMD. Results statistically compared probing measures (probing depth, recession and attachment level) before treatment and after a healing period of 6 to 36 month. They were analyzed and assessed according to the clinical form of periodontitis, patient's smoking habits, bone lesion architecture and healing time.

**Results:** On 52 lesions treated by EMD, failure rate was of 9,6%. Probing depth decreased significantly by  $5,71\text{mm} \pm 2,95\text{mm}$  ( $p < 0,0001$ ) and attachment gain was of  $3,83\text{mm} \pm 2,75$  ( $p < 0,0001$ ). Variation of the attachment level of defects of chronic ( $n=37$ ) and aggressive ( $n=12$ ) periodontal diseases was not significant. Also, no differences were found between smokers ( $n=12$ ) and non-smokers ( $n=37$ ). Level of attachment gain depended on the architecture of the intra-bony defect, and was significantly increased for 2 wall defects compared to inter-radicular defects ( $p < 0,05$ ). It also varied according to the moment of reevaluation and was most important between 1 and 2 years especially when compared to measures at 6 and 12 months ( $p < 0,05$ ).

**Conclusion:** This study showed improvement of clinical parameters in EMD treated intra-bony defects. These parameters were influenced by the architecture of the initial defect and the healing period. However clinical form of periodontitis and patient's smoking habits were not relevant.



## Topic: Periodontal regeneration

**P0898****Novel 45S5 Bioglass®-derived glass-ceramic scaffolds: In vitro assessments of their role in bone regeneration**A. Efthymiou<sup>1</sup>, N. Donos<sup>2</sup><sup>1</sup>Thessaloniki/Greece, <sup>2</sup>London/United Kingdom

**Aim:** Examine the biological properties of this novel Bioglass® matrix in relation to the response of osteoblast-like cells to these glass-ceramic scaffolds, and explore the impact of various characteristics of the material on the growth, differentiation and function of the aforementioned cells.

**Material and Methods:** Highly porous and interconnected three-dimensional (3D) Bioglass®-derived glass-ceramic scaffolds were fabricated. Variations in the material characteristics such as porosity, sintering and surface functionalisation were provided to examine their effect on cell function. Following cell culture preparation (MG63 osteoblast-like cells), preliminary quantitative and qualitative assessments were performed on discs/pellets to examine cell proliferation, morphology and attachment using AlamarBlue™ assay and SEM respectively. The same assessments were then performed on 45S5 sintered Bioglass® scaffolds with two different porosities (45 and 60 ppi) for a short period of 6 days. Finally, the function and characteristics of the MG63 osteoblast-like cells on the scaffolds were assessed long-term by the expression of the alkaline phosphatase (ALP) activity and the bone-associated protein, osteocalcin (OC) and microscopically for a period of 15 days.

**Results:** These novel Bioglass-derived glass-ceramic scaffolds were found to support osteoblast-like morphology and proliferation, the cells stained positively for alkaline phosphatase, and exhibited higher levels of osteocalcin protein expression than bovine-derived bone substitute control materials

**Conclusion:** The findings of this study indicate the promising role of these newly-fabricated Bioglass scaffolds in tissue engineering

## Topic: Periodontal regeneration

**P0899****Which biomaterials may promote periodontal regeneration in animal angular defects? A systematic review**G. Nikou<sup>1</sup>, D. Nikolidakis<sup>2</sup>, A. Ivanovic<sup>3</sup>, A. Sculean<sup>3</sup><sup>1</sup>Tripolis/Greece, <sup>2</sup>Heraklion/Greece, <sup>3</sup>Bern/Switzerland

**Aim:** To systematically analyse the regenerative effect of the available biomaterials either alone or in various combinations for the treatment of periodontal angular defects as evaluated in animal histological studies.

**Material and Methods:** A protocol covered all aspects of the systematic review methodology. The focused question related to the regenerative effect of the available biomaterials either alone or in various combinations for the treatment of periodontal angular defects as evaluated in animal histological studies. Literature search was performed in Medline including hand searching. Combinations of searching terms and several criteria

were applied for study identification, selection and inclusion. The preliminary outcome variable was periodontal regeneration after regenerative therapy obtained with the various regenerative materials as demonstrated through histologic/histomorphometric analysis. New periodontal ligament, new cementum and new bone formation as a linear measurement in mm or as a percentage of the instrumented root length were recorded. Data were extracted based on the general characteristics, study characteristics, methodological characteristics and conclusions.

**Results:** Autogenous grafts, Demineralised bone matrix allograft (DBM), bovine derived xenograft (BDX), guided tissue regeneration (GTR), enamel matrix derivative (EMD), recombinant growth factors (rh-PDGF, rhGDF, rhbFGF, rhBMP-2), bioceramics and bioactive glass were all shown to result in periodontal regeneration in animals in different range alone or in combination.

**Conclusion:** Comparing the biomaterial groups, autogenous grafts and allografts revealed favourable outcomes followed by alloplastic materials, barriers, biological factors and xenografts.

## Topic: Periodontal regeneration

**P0900****Growth factor kinetic study of PRGF-Endoret: the pioneering autologous technology in oral surgery for tissue regeneration**

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Vitoria/Spain

**Aim:** Plasma rich in growth factors (PRGF-Endoret) is an autologous platelet and plasma-based technology that is gaining interest in regenerative medicine due to its potential to accelerate wound healing and tissue regeneration. **Aim:** Characterize the delivery kinetics of growth factors and determine the most important quantitative and qualitative differences between PRGF-Endoret scaffold and other platelet-leukocyte-rich plasma (L-PRP) products. Explore the clinical potential of PRGF-Endoret.

**Material and Methods:** Scaffolds of PRGF-Endoret and L-PRP were prepared from healthy donors and maintained at culture conditions. The released and retained growth factors and pro-inflammatory cytokines were measured using ELISA kits from t=1h to t=8 days

**Results:** PRGF-Endoret releases 70% of plasma and platelet-derived proteins (PDGF, TGF, VEGF, IGF, HGF, EGF) during the initial 8 days while the remaining 30% is retained in the fibrin. The L-PRP products secrete significantly higher levels of pro-inflammatory IL-1 and IL-6 than PRGF-Endoret. From a clinical point of view, the use of PRGF-Endoret in oral surgery includes the treatment of post-extraction defects, the horizontal and vertical bone regeneration, the healing of soft tissues, the bioactivation of dental implants to improve their osseointegration and the treatment of bisphosphonate-related osteonecrosis of the jaw among others. The available clinical data indicate that PRGF-Endoret have the capacity to improve biomaterials handling as well as tissue response in the healing process

**Conclusion:** This pioneering approach is designed for the delivery of multiple cellular modulators and the formation of a fibrin scaffold, thereby providing different formulations that can be widely used in oral surgery.

## Topic: Periodontal regeneration

## P0901

**A three-dimensional cell-collagen construct for periodontal ligament regeneration.**

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*Nijmegen/Netherlands*

**Aim:** Developing regenerative approaches for periodontal ligament (PDL) tissue requires substantial in vitro evidence. However, traditional 2D culture systems have limited capability to mimic the complicated in vivo environment. The aim of this study was to develop a more physiological 3D in vitro model, to allow reliable cell behavioral studies before going into animal and human tests.

**Material and Methods:** PDL cells were isolated from rat incisors. For morphological observations, green fluorescent protein (GFP) transgenic animals were used. Cells were mixed with Type-I collagen gel and injected as a layer of 200 µm thickness, into silicone elastomer dishes, and covered with a custom-designed porous coverslip. The resulting constructs were tested up to 5 days. As mechanical stimulus, 8% longitudinal cyclic stretching was applied. As biochemical stimulus, samples were treated with 100 µg/ml enamel matrix (EMD) proteins. Subsequently, morphology, proliferation, and differentiation were observed, and quantified.

**Results:** Reconstituting stacks of confocal optical slices showed that viable cells spread throughout the construct. Upon mechanical loading, proliferation was enhanced. Generally, cells elongated perpendicular towards the loading direction. Transfer of load occurred throughout the entire sample. Still, morphology (elongation, orientation) was significantly different ( $p < 0.05$ ) between the peripheral vs. more central locations, similar to natural PDL space. Upon EMD stimulation, cells showed significant changes in proliferation and gene expression profile.

**Conclusion:** A new 3-dimensional PDL model was established, to serve as a tool for testing cellular response towards experimental stimuli related to periodontal regeneration; and perhaps at later stage to function as implantable tissue analog.

## Topic: Periodontal regeneration

## P0902

**A novel collagen matrix in multiple gingival recessions: A prospective randomized- controlled single centre study.**M. Schlee<sup>1</sup>, A. Tjaden<sup>1</sup>, F. Rathe<sup>1</sup>, A. Kasaj<sup>2</sup><sup>1</sup>Forchheim/Germany, <sup>2</sup>Mainz/Germany

**Aim:** Aim of this prospective randomized-controlled clinical trial was to assess the effect of a collagen matrix (Mucograft (MG)) for covering recessions, probing depth (PD), clinical attachment level (CAL), width and thickness of the gingiva.

**Material and Methods:** 2 groups (Miller Class I or II recessions, 11 patients in test group (T) and 12 patients in control group (C)) were treated with a coronal repositioned split flap. Serving as a matrix 45 recessions received MG in T and 48 CTG in C. Recession, CAL, width and thickness of keratinized gingiva

(KG) were assessed at baseline and after 6 months.

**Results:** Recessions were significantly reduced from x mm to x (C) and x to x mm (T) ( $p < 0.0001$  in both groups). While initial values of recessions showed x statistical relevance the results differed ( $p = x$ ) statistically relevant. CAL improved from x mm to x mm (C) and x to x mm (T) ( $p < .$ ). PD changed from x mm to x mm (C) and x mm to x mm (T). x% of former exposed root surface could be covered in C and x in T. x out of x recessions (x%) were completely covered. The number of sites with the gingiva assessed as a thin biotype in C changed from x to c and in T from x in x. DATA COLLECTION WILL BE FINISHED MARCH 2012, THEN DATA COULD BE SUBMITTED!

**Conclusion:** Trend: CT shows a slightly better result compared to MG in recession coverage. Changes in PD and CAL were similar in both groups.

## Topic: Periodontal regeneration

## P0903

**Effects of pulverized natural bone mineral on the regeneration of three-wall intrabony defects – An experimental study in dogs.**A. Ivanovic<sup>1</sup>, D.D. Bosshardt<sup>1</sup>, I. Mihatovic<sup>2</sup>, F. Schwarz<sup>2</sup>, A. Sculean<sup>1</sup><sup>1</sup>Bern/Switzerland, <sup>2</sup>Düsseldorf/Germany

**Aim:** To evaluate the effects of different particle sizes and formulations of natural bone mineral (NBM) on periodontal regeneration of intrabony defects.

**Material and Methods:** Mandibular and maxillary first and third premolars were extracted and three wall-intrabony defects (5mmx5mmx5mm) were created on second and fourth premolars. After a healing period of 12 months, an acute type of defect with similar dimensions was created again. The defects were filled with NBM pulverized (particle size: 0.125-0.25mm) (group T1), NBM paste-like (pulverized Bio-Oss + gel) (group T2), or Bio-Oss® granules (particle size: 0.25-1.00mm) (group C). All defects were covered with a Bio-Gide® membrane. The dogs were sacrificed after 12 weeks and the specimens were analyzed histologically and histometrically.

**Results:** Healing of all defects was uneventful. The histologic evaluation revealed comparable results for all three groups. New cementum, new periodontal ligament and new bone were observed in all defects. The vertical gain in new bone varied between 1.62mm-5.72mm (C), 2.81mm-5.82mm (T1), and 1.72mm-5.03mm (T2), that of new cementum from 0.67mm-6.51mm (C), 1.32mm-5.70mm (T1), and 0.18mm-5.56mm (T2). The NBM particles were both incorporated in new bone and embedded in immature bone marrow. No inflammatory reactions were observed in the augmented regions.

**Conclusion:** All three treatment modalities did not reveal adverse tissue reactions and resulted in regeneration of cementum, periodontal ligament, and bone.

Topic: Periodontal regeneration

## P0904

### Guided Bone Regeneration Around Immediate Dental Implant in a Dehiscence Type Defect using Platelet Derived Growth Factor

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<sup>1</sup>Riyadh/Saudi Arabia, <sup>2</sup>Michigan/United States of America

**Aim:** To assess the guided bone regeneration around immediate implants using bone graft and platelet derived growth factor with and without a barrier membrane.

**Material and Methods:** Five beagle dogs were used. In each dog, mandibular premolars (P3 and P4) were atraumatically removed and immediate implants were installed. The animals were divided into four treatment groups as follows: Group 1: Two dehiscence defects received xenograft and recombinant human (rh)-PDGF-BB; (Group 2) two with xenograft, PDGF and collagen membrane.; (Group 3) two dehiscence defects filled with xenograft and collagen membrane; and (Group 4) two dehiscence defects served as controls (implant without any treatment). The jaw segments were analyzed using micro-computed tomography (micro-CT).

**Results:** Buccal bone thickness, bone volume and BIC were significantly higher around implants in group 2 as compared to other groups (P<0.001)

**Conclusion:** Platelet derived growth factor when used in combination with xenograft promotes guided bone regeneration (GBR). The role of barrier membrane in GBR protocols is rather secondary.

Topic: Periodontal regeneration

## P0905

### Crown-splinted Molars developed Hypercementosis with an unique Cementum-Algipore®-Bridging

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Vienna/Austria

**Aim:** Hypercementosis of individual molars can be caused by inflammation and/or loss of masticatory function (Schroeder 1986). Long-term crown-splinting of three molars had resulted in hypercementosis and a radiodense bridging between two teeth, accompanied by therapy-resistant gingivitis. One extracted tooth with part of the bridge were pathohistologically evaluated.

**Material and Methods:** A 49 years old woman showed interproximal gingivitis in the crown-splinted left lower molar area. Professional pocket cleaning after demounting one 10 years old crown and flap access exposed a „hard tissue bridge“ between the roots of 36 and 37. Probing depth increase from 3 mm to 9 mm within 6 months compelled extraction of tooth 37 with part of the bridge. Plastic-embedded Giemsa-surface stained ground sections were prepared for light microscopical evaluation.

**Results:** Pre-extraction radiograph showed diffuse root hypercementosis on 36 and 37, and a radiodense bridge between the teeth. Pathohistology showed diffuse mixed cellular and acellular

hypercementosis which extended into the bridge, forming direct contacts with the Algipore® bone substitute material.

**Conclusion:** Loss of function (splinting) and chronic inflammation had caused hypercementosis. The „cementum conductivity“ of the bone substitute had led to unique „bridging“ and rootmelting. A literature search for cementum hyperplasia in conjunction with bone substitutes has yielded no results, but this so far not described interaction between cementum and a bone substitute may have basic biological and clinical relevance.

Topic: Periodontal regeneration

## P0906

### Fluorochrome labeling of bone biopsies after vertical ridge augmentation using soft tissue expansion and membranous or endochondral bone grafts

D. Kaner, W. Arnold, A. Friedmann

Witten/Germany

**Aim:** Results of autogenous bone grafting are attributed to the embryonic origin of the graft. We applied fluorochrome labeling in order to evaluate different healing patterns of after transplantation of membranous or endochondral bone grafts.

**Material and Methods:** 12 patients with severely resorbed ridges were treated with vertical bone augmentation using soft tissue expansion with self-filling osmotic tissue expanders (Osmed, Germany) and, subsequently, onlay grafts of membranous (mandibular ramus, calvaria) or endochondral (ilium) origin. 4 to 6 weeks after grafting, fluorochrome labels were given to all patients in standard format: 3 days of tetracycline HCl (500 mg, 2x/d), a 12 days intermission, again 3 days of tetracycline (500 mg, 2x/d). At implant placement 4-6 months after augmentation, bone core biopsies were harvested using a trephine drill. Biopsies from implant placement in native bone served as controls. Biopsies were embedded in methacrylate and serial sections were examined under a light microscope and under UV light for presence and intensity of tetracycline labels.

**Results:** Tetracycline labels were clearly present in two control biopsies from native bone. All nine biopsies taken after augmentation using mandibular or calvarial bone showed tetracycline labels, but these were less distinct than in controls. From seven biopsies taken after grafting from the posterior ilium, only two showed very weak presence of tetracycline labels, while five biopsies showed no tetracycline labels at all.

**Conclusion:** Membranous grafts show higher incorporation of tetracycline than endochondral grafts.

Topic: Periodontal regeneration

## P0907

### Interdisciplinary treatment of the black triangle disease: case report and literature review

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Zurich/Switzerland

**Aim:** The interdental region is a complex and fragile oral soft

tissue. Papilla loss leads to the so-called “black triangle disease”, which significantly compromises the aesthetic appearance and may lead to phonetic problems. The therapeutic management is still demanding. This report presents a case treated by GTR and restorative treatment. It critically discusses the biological background, diagnostic and therapeutic options based on the available literature.

**Material and Methods:** A case is presented with localized loss of the papilla between teeth 12 and 11 due to a vertical bony defect. The interdisciplinary treatment started with a periodontal regenerative approach (GTR) followed by a restorative correction of the interdental region using direct composite material. The latter aimed to close and to narrow the space, thereby also reducing the distance between contact point and crestal bone, which seems to be an essential prerequisite for a biological black triangle closure.

**Results:** Although the regeneration was successful, the re-formation of the interdental soft tissue is often limited as corroborated by the literature, especially without concomitant modification of the crown anatomy. The correction with a composite material, however is effective and easy. The positive result could be maintained over a one-year observation period.

**Conclusion:** Future approaches should include microsurgical periodontal principles with and without grafts. New materials for interdental soft tissue augmentation should be developed and investigated. This includes also surgical techniques like gingiva expansions or distraction procedures. The benefit of interdisciplinary hard tissue modification should also be considered.

Topic: Clinical Tips and cases: Regeneration

## P0908

### Comparison of treatment of intrabony defects with enamel matrix proteins alone or combined with autologous bone graft

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Ljubljana/Slovenia

**Aim:** To compare efficiency of enamel matrix proteins alone (EMP) or combined with autogenous bone graft (EMP + ABG) for regeneration of intrabony defect using clinical attachment gain as the primary outcome.

**Material and Methods:** In parallel, randomised clinical trial 15 consecutive chronic periodontitis patients with at least one intrabony defect, stemically healthy, non-smokers, were included. After appropriate treatment of other sites, they were randomised into two groups (intrabony defect treated with EMP or EMP + ABG). Before and one year after surgery probing depths, recession, clinical attachment level and mobility were measured and radiographs were taken to determine the width of intrabony defect and remaining bone support. Pre- and post-treatment results were compared with paired t-test. Regression analysis was used to evaluate the effects of treatment and clinical factors on clinical attachment gain.

**Results:** 18 intrabony defects treated with EMP + ABG and 10 with EMP were evaluated. Both treatment methods resulted in significantly reduced probing depth (EMP:  $3,4 \pm 1,8$  mm, EMP + ABG:  $4,1 \pm 1,7$  mm) and gain of clinical attachment level (EMP:  $2,8 \pm 2,2$  mm, EMP + ABG:  $3,2 \pm 2,4$  mm). Only EMP + ABG significantly improved remaining bone support (for 34 ±

16%), but also significantly increased gingival recession ( $0,9 \pm 0,1$  mm). Regression analysis failed to reveal significant effect of any factor, including treatment mode, on clinical attachment gain ( $p > 0,05$ ,  $\beta < 0,8$ ).

**Conclusion:** EMD or combination of EMD and ABG seem to be equally successful for regeneration of intrabony defects.

Topic: Clinical Tips and cases: Regeneration

## P0909

### Immediate autotransplantation of teeth in sockets exhibiting chronic apical abscess: 2-years results of 4 cases.

D.O. Cuitiño, F.S. Bravo

Punta Arenas/Chile

**Aim:** INTRODUCTION This case series evaluated the outcome of immediately autotransplanted teeth following tooth extraction in recipient sites exhibiting chronic apical abscess. Cases were clinically and radiologically followed for at least 2 years.

**Material and Methods:** CASE REPORT Four molars (3 mature and 1 immature) in 4 patients were immediately autotransplanted in sockets exhibiting chronic apical abscess. None sites treatment, just careful debridement, previous to prepare the recipient sockets were performed. The mean age was 30 (range 15-45) The follow-up period ranged from 25-42 months (mean 30 months). Periodontal and pulp healing, based on 7 clinical and radiographic criteria, were analyzed.

**Results:** DISCUSSION Two years after transplantation, there was no sign of bone loss or root resorption. The postoperative healing was uneventful in all cases.

**Conclusion:** It is concluded within the limitations of this case series, that after careful debridement of the extraction socket and appropriate management of the donor tooth, immediate placement of autotransplanted teeth -mature or immature- in sites with chronic apical abscess can be a successful treatment modality.

Topic: Clinical Tips and cases: Regeneration

## P0910

### Plasma Rich in Growth Factors (PRGF-Endoret) associated with connective tissue grafts in the treatment of gingival recessions

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Vitoria/Spain

**Aim:** Evaluate the effectiveness of Plasma Rich in Growth factors (PRGF-Endoret), associated to Connective Tissue Graft (CTG) procedure for gingival recessions treatment.

**Material and Methods:** Surgical technique was based on the use of CTG combined to coronally advanced flap or tunneling procedure, associated with the application of PRGF-Endoret both in the donor and treated area. Clinical variables were recorded before and after procedure including Recession Height (RH), Probing Depth (PD), bleeding, mobility, Keratinized



Gingival Height (KGH), and Recession Width (RW).

**Results:** Eighteen gingival recessions (11 Miller class I and 7 class II) in 10 patients were treated. Mean follow-up time since surgery was 5.28 months (SD= 2.7). RH values at baseline were 2.06, 3.83 and 2.00 mm at mesial, medial and distal respectively, which were reduced to 0.22, 1.33 and 0.28 mm at final evaluation. This consisted in defect coverage percentages of 92.2 % in mesial, 64.72 % in medial and 82.2 % in distal. PD values were increased in 0.41 mm (SD= 0.48). Mean increase in the KGH was 1.89 mm (SD=0.76) and mean decrease in the RW was 2.47 mm (SD= 1.14). Mobility was reduced from grade I to 0 in 2 of the 7 teeth that showed mobility. Bleeding sites were also reduced after procedure (from 18 to 1).

**Conclusion:** This treatment modality resulted in the improvement of all evaluated variables showing good defect coverage results, KGH increase, and decrease in RW, mobility and bleeding. This procedure could be considered an effective treatment for Miller Class I-II recession type defects.

Topic: Clinical Tips and cases: Regeneration

## P0912

### Comparison of the Long Term Efficacy of Platelet Pellet and Bioactive Glass Graft Material in Reconstructive Periodontal Therapy

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Samsun/Turkey

**Aim:** There are numerous experimental and clinical studies that platelet rich plasma, a member of biological mediators, was used alone or with a combination of a variety of graft materials and barrier membranes. However, no data on long-term results are at present available. The purpose of the study was to compare long term (5-year) results of the clinical and radiological effectiveness of platelet pellet/barrier membrane (PP/BM) and bioactive glass/BM (BG/BM) in the treatment of periodontal defects.

**Material and Methods:** Using a split mouth design, 15 chronic periodontitis patients with probing pocket depths (PPD)  $\geq 6$  mm following initial periodontal therapy were randomly assigned to treatments with a combination of PP/BM or BG/BM. PPD, clinical attachment level (CAL), and radiographic alveolar bone level (RABL) were measured at preoperative, postoperative 6 months and 5 years.

**Results:** Both short and long term results showed that two treatment modalities resulted in significant PPD reduction, and CAL and RABL gain compared to the preoperative values ( $p < 0.01$ ). Differences between the treatment groups were not statistically significant at 6 months and 5 years ( $p > 0.05$ ).

**Conclusion:** Within the limits of present study; it was concluded that the long term efficacy of PP combined with barrier membrane is similar with bioactive glass graft material and the 5 year results of the present study suggested that this biological mediator may be a suitable alternative for the reconstruction of periodontal defects.

Topic: Clinical Tips and cases: Regeneration

## P0913

### Tunnel subepithelial connective tissue graft with emdogain for the treatment of multiple adjacent gingival recessions: a clinical report

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<sup>1</sup>Huesca/Spain, <sup>2</sup>Palencia/Spain

**Aim:** Gingival recession is defined as the apical migration of the junctional epithelium with exposure of root surfaces. Different surgical cosmetic techniques for the coverage of exposed roots caused by gingival recession have been developed and improved since more and more patients demand procedures to improve their esthetic appearance. Its etiology is determined by predisposing and precipitating factors.

**Material and Methods:** A female patient of 37 years old with multiple recessions because of an inadequate brushing technique is presented. Two adjacent type II Miller recessions in 2.3 and 2.4, with 5 mm and 2 mm respectively were treated. The surgical technique used was based on the performance of a tunnel without raising the papillae. A large connective tissue graft obtained from the palatal mucosa was introduced through this tunnel, covering the adjacent gingival recessions. Emdogain was applied to both the connective tissue graft and the tunnel.

**Results:** The aim of this poster is to present a patient with multiple adjacent gingival recessions treated with a tunnel subepithelial connective tissue graft with emdogain. A 100% stable coverage of both recessions was achieved after a week, two weeks, one month and three months improving the esthetic appearance and solving the sensitivity of the roots to both cold and heat.

**Conclusion:** This poster suggests that the use of the proposed surgical technique in combination with the application of enamel matrix proteins allows the treatment of multiple type II Miller adjacent recessions in a single surgical procedure with an adequate early healing and highly predictable root coverage results.

Topic: Clinical Tips and cases: Regeneration

## P0914

### In-vitro-testing of Biomaterials for the therapy of periodontal bone lesions

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Jena/Germany

**Aim:** Infection of the periodontal tissue by pathogenetic bacteria can lead to inflammation and degeneration. For some extent regeneration can be supported by biomaterials. The aim of this In-vitro-study was to test the biocompatibility as well as the antibacterial and mechanical properties of two new designed biomaterials (BioM) with antimicrobial activity based on a photodynamic reaction of mTHPC.

**Material and Methods:** BioM I (Polyesterurethanmethacrylat) and BioM II (Urethantrimethacrylat) were mixed with  $\beta$ -TCP and 20 vol% mTHPC. The materials were then applied to a silicon form and polymerized with a dental LCU (460nm, 500mW/cm<sup>2</sup>, 2x30s) in order to produce samples of cylindrical

shape. The samples were then tested regarding their bending and fracture strength as well as Young's modulus. The cytotoxicity was evaluated for MC3T3-cells after direct cultivation and incubation with biomaterial extracts for 28 days. The antibacterial efficiency was tested for *Porphyromonas gingivalis* and *Enterococcus faecalis* after irradiation of the samples with laser light (652nm, 1W, 100J/cm<sup>2</sup>).

**Results:** BioM I showed the highest flexural strength. The fracture strength and the module of elasticity remained identical for both materials. No cytotoxicity was estimated on MC3T3-cells. Irradiation of BioM 2 by laser light resulted in complete suppression of *E. faecalis*. For both materials *P. gingivalis* was reduced up to 3 log-units.

**Conclusion:** As the results show there are two potential Biomaterials with good mechanical and antibacterial properties for the treatment of periodontal bone lesions.

Topic: Clinical Tips and cases: Regeneration

## P0915

### Impact of an oily calcium hydroxide suspension on bone formation in tibial defects. An experimental study in minipigs

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<sup>1</sup>Dusseldorf/Germany, <sup>2</sup>Timisoara/Romania, <sup>3</sup>Bern/Switzerland

**Aim:** To evaluate bone formation in critical size defects using an oily calcium hydroxide suspension(OCHS).

**Material and Methods:** 4 Goettinger minipigs underwent general anesthesia and the surgical area was disinfected. A flap was reflected to expose the medial face of the tibia. A rectangular cortical lid (2cmx1.5cm) was created and removed. The bone marrow was excavated to create a chamber of cca.2ml volume. Defects in the test group (2 minipigs) were filled with OCHS(Osteora,DFS-Diamon,Riedenburg,Germany) while defects in the control group (2 minipigs) were filled with animal's own blood. Cortical lids were repositioned with titanium osteosynthesis plates and wound closure layer by layer was performed. Animals were sacrificed at 4 and 8 weeks. Tibias were dissected, soft tissues removed and processed for non-decalcified sectioning. Serial transversal sections of 500microns were stained. Digital images (x200) were evaluated using the software CellID (Soft Imaging System,Munster,Germany). Histomorphometrical landmarks were: defect size, mineralized and non-mineralized tissue, residual OCHS.

**Results:** Postoperative healing was uneventful. In the test group, the majority of the sections were mainly characterized by non-mineralized tissue, with reduced formation of trabecular bone in the vicinity of the defect margins. Mean percentages of mineralized tissue were 23.01% in the Osteora group vs. 43.45% in the control group, while mean value for residual OCHS was 7.11%. At 8 weeks, no differences could be observed. Mean percentages of mineralized tissue were 28.15% in the Osteora group vs. 44.39% in the control group, as well as 7.05 for residual OCHS.

**Conclusion:** The results of the present study question OCHS as a bone-inducing material for regeneration.

Topic: Clinical Tips and cases: Regeneration

## P0916

### vertical ridge augmentation with allograft and collagen membrane

J. Delgado Gregori, H. Campos Litao

Madrid/Spain

**Aim:** Missing tooth may lead to bone resorption, and sometimes its difficult to restore that area with implants. Horizontal bone resorption may be predictibly solved by guided bone regeneration techniques. Vertical bone defects have been treated with different techniques but non of them is predictable.

**Material and Methods:** 35 year old non smoking woman comes to periodontology department at Universida Alfonso X el Sabio with a missing right lateral and failing implant on the right canine. 2 months after implant removal, an 8 mm height defect is found. During the surgery, 2 screws are placed as a tent, and the space is filled with an allograft (Puros), covering all with a cross linked collagen membrane. Everithing is sutured without tension.

**Results:** 6 months post surgery a tomography is taken . 7 mm height are gain and soft tissues are healthy. 1 month later, an implant will be placed and a trephine will be used for histology.

**Conclusion:** in progress. In 1 month implant surgery will take place and histolgy will be made

Topic: Clinical Tips and cases: Regeneration

## P0917

### An unusual case of an extramedullary manifestation of a myelo sarcoma on the alveolar ridge

B. Kirnbauer, A. Woelfler, A. Beham, N. Jakse

Graz/Austria

**Aim:** A myelo sarcoma represents a rare extramedullary manifestation of a malign tumor consisting of immature myeloid cells.

**Material and Methods:** This case describes the occurrence of a singular myelo sarcoma of the gingvia before manifestation of an acute myeloic leukemia. A 77-year-old female patient was referred to the Department of Oral Surgery and Radiology, Medical University Graz by her dentist because of a painless hypertrophic alteration of the mucosa at the alveolar ridge in regio 26. So the excision of the epuliform modification, as well as the removal of a retained root in the same region and the extraction of 27 was performed. The pathological result showed tissue parts infiltrated by a myelo sarcoma. Further examinations showed morphologically infiltrateless, nearly normocellular bone marrow and an inconspicuous peripheral haemogram. Nevertheless locoregional radiotherapy with 50 Gy over 5 weeks was carried out in interdisciplinary consensus.

**Results:** The diagnosis of a primary myelo sarcoma is intricate and demands high standards of the attending medic. As far as differential diagnoses are concerned reactive lesions, benign tumors, but also sarcomas, lymphomas, epidermoidcell carcinomas and metastases have to be taken into consideration by all means. The taking of a biopsy is definitely vital for the histo-

pathological and immunohistochemical examination. A surgical excision and/or a locoregional radiotherapy are said to be less sufficient for the successful combat of an isolated myelo sarcoma. Hence the prognosis is most valid after chemotherapy.

**Conclusion:** 11 month after surgical therapy, the patient still shows no signs of systemic leukemia.

Topic: Clinical Tips and cases: Regeneration

## P0918

### Effect of commercial mouthrinses (Listerine, Corsodyl) and three herbal medicines (Salvia, Chamomile, Calendule) on fibroblast cells cultured.

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<sup>1</sup>324/Poland, <sup>2</sup>327/Poland, <sup>3</sup>432/Poland, <sup>4</sup>101/Poland

**Aim:** Introduction

The aim of the study was to compare the influence of mouthrinses on the human fibroblast.

**Material and Methods:** Case report

The influence of Listerine, Corsodyl mouth rinses and salvia, chamomile and marigold brews on human fibroblast biology of line CCD16 was studied. Due to the fact that Listerine and Corsodyl are alcohol solutions, the influence of 22% ethyl alcohol on fibroblasts CCD16 was additionally investigated. The cells were cultured in an incubation medium which contained the aforementioned substances. After 24 and 48 hours the morphology, relative cell growth on the plates and fibroblast vitality were assessed. The cell vitality was assessed after 48 hours of incubation on the basis of staining. The apoptotic cells were identified by the characteristic fragmentation of nucleic chromatin.

**Results:** Discussion

The solution of 22% ethyl alcohol added to the culture medium have not significant influence on the fibroblast proliferation. Corsodyl, salvia reduced fibroblast proliferation, stimulated apoptosis and changes in the cell morphology. The reaction of Listerine depended on the dose. Chamomile and marigold brews did not change the morphology of fibroblasts.

**Conclusion:** In contrast to chamomile and marigold brews Corsodyl and Listerine solutions and the salvia brew have negative influence on the biology of fibroblasts.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0919

### EFFECTS OF PREGNANCY ON PERIODONTAL TISSUES

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**Aim:** Pregnancy epulis is a localized benign lesion that develops on the gingiva generally associated with local irritation, trauma

and hormonal factors. It is treated with a variety of methods, most commonly non-surgical treatments and elimination of local irritants.

**Material and Methods:** A 25-year-old woman in the 4th month of her pregnancy presented a lobulated hemorrhagic gingival mass on the buccal-palatal aspects of the dental implant placed 4 years ago in the 22 tooth position. Detailed examination revealed that this pedunculated gingival enlargement was reddish in colour with an irregular surface. Excessive amount of dental plaque was detected on the gingival margin, especially around the implant and the adjacent tooth. Periodontal examination revealed 8mm of probing depth on the buccal-proximal aspects of implant and tooth 23. Initial mechanical periodontal therapy was performed. Since her pregnancy occurred with an in vitro fertilization she preferred the lesion only to be followed during the pregnancy. Despite the continuous non-surgical therapy, the lesion got worst in the 8th month. In the 9th month, the size of the lesion started to diminish spontaneously. It was 1.3×1.2×1.1cm at 4 months, 0.9×0.9×0.7cm at 9th months and was removed 2 months after the delivery.

**Results:** The size of the lesion increased through the pregnancy period when the level of female hormones is the highest. Spontaneous regression started at 9 months if the local irritants are eliminated.

**Conclusion:** This case confirmed that gingival lesions in pregnancy are inflammatory reactions that develop as a result of local irritation to the hormonally altered gingival tissues.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0920

### Dentin dysplasia type I: a case report

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**Aim:** Dentin dysplasia is a rare hereditary disturbance of dentin formation characterized by defective dentin development with clinically normal appearing crowns, severe hypermobility of teeth and spontaneous dental abscesses or cysts. Radiographic analysis shows obliteration of all pulp chambers, short, blunted and malformed or absent roots and peri-apical radiolucencies of non carious teeth.

**Material and Methods:** We present a case of dentin dysplasia type I in a 12-year-old girl who has complain mobility and deposition dental calculus at mandibular incisors , and the clinical, radiographic, familial and periodontal findings of this condition are described.

**Results:** There are still many inconclusive issues in the diagnosis and management of patients with dentin dysplasia. The diagnostic features of this rare disturbance will remain incompletely defined until additional cases have been described.

**Conclusion:** Early diagnosis of the condition and initiation of effective regular oral hygiene education may help these patients to prevent or delay loss of dentition.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0921

### Restoring the function in otherwise lost periodontally involved teeth – splinting versus tooth extraction

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Zagreb/Croatia

**Aim:** Introduction Periodontal disease during its course results in the loss of the periodontal support, leading to tooth extraction. This lost is then compensated with considerably higher cost of prosthodontic treatment of the remaining teeth.

Similar objectives could however be achieved through an alternative therapy where the esthetic remodeling of the teeth and the closure of the periodontal interproximal spaces is obtained with splinting the residual teeth with composite resin materials, wire and fiber-reinforced composite resin.

**Material and Methods:** Case report

A series of case reports with full periodontal treatment, followed by regenerative periodontal surgery and permanent composite, wire and fiber-reinforced splints, with a range of follow-up from one to fifteen years will be presented.

**Results:** Discussion Full conventional periodontal therapy, elimination of inflammation and reduction of periodontal pathogens, regenerative periodontal surgery still leaves us with a significant tooth loss due to the alveolar ridge bone loss. To avoid the extractions in many cases we can achieve the stabilization of the residual teeth by splinting, thus avoiding the more costly treatments.

**Conclusion:** Periodontal disease is a debilitating disease. Especially aggressive periodontitis results in a severe reduction of the periodontal ligament and tooth loss. The reduction of the alveolar ridge bone and the presence of periodontal pathogens make those cases harder to treat with costly implants and prosthodontic replacements. By splinting the residual periodontally involved teeth with fiber-reinforced composite resin materials a therapist can achieve sufficient tooth stability and good esthetic results.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0922

### Chronic pain and swelling of a maxillary molar tooth due to a broken periodontal curette tip: unforeseen iatrogenic factor.

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<sup>1</sup>Zonguldak/Turkey, <sup>2</sup>Istanbul/Turkey

**Aim:** Injuries of oral hard and soft tissues may occur due to accidental, iatrogenic and factitious traumas. The presented case demonstrates an iatrogenic factor with a seldom complication of a broken periodontal curette embedded to the furcation.

**Material and Methods:** 55 year-old man, referred to Department of Periodontology for routine periodontal treatment. After

periodontal probing the physician (MIC) noticed a furcation defect of maxillary right second molar. During periodontal curettage the active part of the curette was broken due to metal fatigue. The physician searched subgingival area by periodontal probing for the missing part. After detailed examination the broken part wasn't found and thought it might be gone while splitting out. Five days after periodontal treatment the patient noticed swelling and pain while chewing on the right side and attempted to our clinic. A metallic artifact of about 1-2mm was detected by panoramic radiography in related region with a surrounding inflammation in close contact to the furcation of the maxillary molar tooth. Sulcular incisions were made and inflamed and metallic inclusion was removed from the furcation under local anesthesia and postoperatively, pain and swelling disappeared within 1 week.

**Results:** The authors assume that the chronic pain results from the broken part of the curette embedded to the furcation roof.

**Conclusion:** This unforeseen iatrogenic factor is a good example for a physician to realize a broken part of a periodontal curette might be embedded hard to furcation and at least periapical radiographies should be taken in order to check the suspected area.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0923

### Bruxism and Gingival Abscess: A Case Report

S. Metin, S. Sahin, M.V. Bal, I.N. Saygun  
Ankara/Turkey

**Aim:** The aim of this case presentation is to report the gingival abscess on the posterior mandibular area due to a rarely seen cause.

**Material and Methods:** 48-year old woman was referred to our clinic with the complaint of pain at the right mandibular posterior area. She had pain and difficulties in eating for two days. Also she is a bruxist patient. In intra-oral examination interdental gingival abscess on the 46 and 47 teeth area was seen. Although there was no dental pathology identified from the examination of her right posterior mandibular area's periapical radiography taken two months ago, it was seen from her new periapical radiography that there was a break on the 46 tooth's disto-buccal corner. At the clinical examination, the tooth's abscess was the result of that broken piece which moved toward the apical and stabbed into the interdental gingival. That broken piece was taken out with local anesthesia. After scaling and root planning were implemented, cavities were filled temporarily. One week later, permanent fill were done, and occlusal stent were conducted to the patient for bruxism.

**Results:** After the removal of foreign piece, and implementation of scaling and root planning, gingival abscess were restored without any problem. It is observed that occlusal stent implementation ceased the temporal pain of the patient at the end of third month.

**Conclusion:** It must be taken into consideration that, in addition to the chronic effects on the periodontal tissues, bruxism may cause acute effects such as gingival abscess caused by broken tooth, as in our case.



Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0924

### The cost effective rehabilitation of the dentition in the aesthetic zone following management of periodontal disease.

R.J. Yates, A.J. Barber

Bristol/United Kingdom

**Aim:** Introduction The impact of periodontal disease frequently leads to a compromised appearance of the dentition. Recent research has highlighted this problem including the patients' experiences of the impact of periodontal disease on their daily lives (O'Dowd et al 2010). The management of a patient presenting with poor dental appearance following periodontal disease is described. Periodontal and restorative clinical procedures involved, evidence-base for the treatment strategy and improvements in quality-of-life are discussed.

**Material and Methods:** Case Report Diagnoses included severe chronic periodontitis. Drifting of teeth had occurred during the active phases of periodontal breakdown. Periodontal management; cause-related therapy followed by supportive periodontal therapy was instigated. Following the healing phase the patient expressed concern regarding the appearance of the dentition, particularly the spacing present as a result of tooth movement and also gingival retraction following resolution of disease. Tooth form and shape was modified utilising composite resin restorative material to achieve a satisfactory presentable appearance.

**Results:** Discussion Periodontal disease and management of periodontal disease frequently has a negative impact on the appearance of the dentition. Many patients accept this appearance believing that little can be achieved without tooth extraction or costly laboratory constructed restoration. Dental care professionals may be unsure of possible procedures and also appropriate timing of restoration following disease management.

**Conclusion:** Conclusion The case demonstrates the multidisciplinary periodontal-restorative management of a case involving advanced periodontal disease and restoration to satisfactory form and function.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0925

### Correction of pathologic tooth movement with occlusal splint in localized aggressive periodontitis patient

D. Illes, D. Vrazic

Zagreb/Croatia

**Aim:** A 45 year old patient was referred to department of periodontology with complaints of occasional bleeding of the gingiva while brushing and migration of the upper right incisor.

**Material and Methods:** After thorough examination, family

history, clinical indices and occlusion analysis patient was diagnosed with localized advanced aggressive periodontitis. Notable measurement was with upper right first incisor having pocket depth of 10 mm mesial and 8 mm palatal as well as abrasion on all teeth and significant diastema between upper central incisors. Plaque and bleeding indices were relatively low. Non-surgical periodontal therapy was performed. Reevaluation after two months revealed residual pocket on upper right incisor. We did a regenerative surgical procedure to eliminate residual pocket and manage the intrabony defect. Immediately after the procedure patient was provided with stabilization splint which was aimed to disocclude any inadequate tooth contacts. In order to reposition upper central incisor splint had been modified during next three months in regular intervals.

**Results:** Patient was very displeased about his smile before he came to our Department. So, although primarily we were thinking of his periodontal health and occlusion, we had to think of his aesthetic result in the end as well. Patient was very motivated which made our tooth repositioning therapy with continuous splint augmentation possible.

**Conclusion:** After one year of combined therapy at Department of Periodontology and Department of Prosthodontics we have acceptable aesthetics in the upper front region with nearly closing the diastema.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0926

### Trichotillomania and Gingivitis: A Case Report

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**Aim:** Trichotillomania is a compulsive control disorder characterized by an urge of pulling hair resulting in hair loss. Its incidence can be as high as 4% with a four-fold susceptibility in women. The aim of this case presentation was to report a rare gingivitis case associated with trichotillomania.

**Material and Methods:** During the oral examination of a 19-year old female who referred to our clinic with spontaneous gingival bleeding, pieces of hair were retrieved from the gingival sulci of maxillary and mandibular teeth. The patient reported that she has been plucking her hair and putting into her mouth for five years. Clinical and radiographical examination demonstrated gingival inflammation with no signs of periodontal destruction. After the consultation with the psychiatry department, the patient was diagnosed with trichotillomania and trichophagia (hair eating). Clinical treatment was provided and indices were taken for two months in parallel with the medical treatment.

**Results:** Gingival health was restored by the second month of the psychiatric treatment and prevention of her hair pulling and eating habits. Gingival index and bleeding on probing improved compared to baseline.

**Conclusion:** While there are no common etiological factors in trichotillomania and gingivitis, gingival and periodontal diseases could arise due to mechanical retention caused by the hair between the dentition.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0927**

### **Ligneous Conjunctivitis and Ligneous Periodontal Disease: Report of 3 Cases**

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**Aim:** Introduction: Ligneous conjunctivitis is a rare form of chronic conjunctivitis characterized by the accumulation of amyloid or fibrin like material with pseudomembraneous lesions mainly on the tarsal conjunctivae. Lesions may be seen on the other mucous membranes of the body including oral mucosae. In this report 3 ligneous conjunctivitis cases, two of whom are sublings and their uncle were presented.

**Material and Methods:** Case Report: The older subling and the uncle showed ligneous gingivitis and ligneous periodontitis respectively. Despite the strict periodontal therapy, oral hygiene instructions and gingivectomy procedures no notable clinical benefit was achieved. Gingival tissue samples were taken after gingivectomy procedures and histologic examination was done. Fibrin deposition under the epithelium layer besides edema and leukocytes exudation were noted.

**Results:** Discussion: With the identification of the underlying gene defect and a greater understanding the biology of the disease better treatment alternatives may be developed. Investigations are focusing of effective therapy capable of preventing destructive evolution of the disease.

**Conclusion:** Until such treatments are developed the treatment of periodontal manifestations of this disease will be difficult.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0928**

### **Plaque Preventive Efficacy of Chlorhexidine Tooth Paste: A 16-Day Clinical Trial**

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**Aim:** Chlorhexidine gluconate (CHX) is the most efficient antiplaque agent. It has a number of forms for dental needs; mouthrinse, irrigation solution, gel, etc.. The aim of this clinical study was to determine antiplaque and antigingivitis efficacy of chlorhexidine toothpaste as compared to a standard toothpaste.

**Material and Methods:** A total of 20 periodontally healthy dental students were recruited into the study. All subjects received dental prophylaxis before baseline. All study subjects used CHX toothpaste to brush 1st and 3rd quadrants and the control toothpaste for the remaining quadrants. Subjects were

advised to brush using modified Bass technique. Plaque index (PI), gingival index (GI), bleeding on probing (BoP) and pocket depth (PD) were recorded at baseline and 16 day. The differences between test and control toothpaste cleaned quadrants in terms of the given indices were analysed using Mann-Whitney U test. The subjects answered a questionnaire about the therapy.

**Results:** There was significantly more plaque accumulation in the control group demonstrating CHX to be more efficient to prevent plaque accumulation ( $p < 0,05$ ). Gingival index scores were reduced in the test toothpaste ( $p > 0,05$ ), however there was an increase in the control toothpaste group at 16 day compared to baseline. The BoP scores demonstrated parallel evidence to GI scores. The questionnaire showed CHX toothpaste to be as acceptable as the control toothpaste.

**Conclusion:** Chlorhexidine containing toothpaste is more efficient to prevent plaque accumulation compared to a standard toothpaste.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

**P0929**

### **The Effects of Humic Acid on the Treatment of Periodontal Abscesses: A Case Report**

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Sivas/Turkey

**Aim:** Introduction: Periodontal abscess is a frequent periodontal condition in which periodontal tissues rapidly destroyed. The abscess microflora is dominated by gram-negative anaerobic rods, including well-known periodontal pathogens. Humic substances may occur from many different sources. Some of the characteristics of humic acid in the medical field are studied: anti-inflammatory, anti-viral, anti-bacterial, anti-allergic, anti-ulcerogenic, oestrogenic properties.

**Material and Methods:** Case report:

21 year old male patient applied to our clinic with complaints of pain and periodontal abscess in the mandibular left first molar. In addition, there was severe gingival inflammation and pus formation. Probing depth was  $>10$ mm. Periodontal and endodontic treatment were performed. After scaling and root planning, lesion was irrigated with humic acid (15% purity, 2cc). After 1., 6. week and 3 month, the clinical parameters were evaluated.

**Results:** The mean PD and CAL before and after treatment were evaluated. After the treatment PD and CAL significantly decreased on week 6 and month 3 compared with the baseline measurements. At first week rapid healing was observed at sites with periodontal abscess. PI and GI significantly improved at the end of the study.

**Conclusion:** Humic acid decreased significantly PI, GI and PD values and pus formation in a 21-year old man with periodontal abscess.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0930

### photoactivated disinfection therapy as an interceptive treatment in a seven year old patient with generalized aggressive periodontitis

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Tabriz/Iran

**Aim:** Introduction: Photoactivated disinfection involves the application of a photosensitizer activated with a specific wavelength. With activation of the photosensitizer singlet oxygen and other radical species are produced, causing selective destruction of the target microorganisms.

**Material and Methods:** Case report: A seven year old child with pus formation around lower incisors was referred to the periodontics department. Pocket depths in all areas were more than 6 mm. Significant BOP observed in all sights and advanced bone loss around erupted teeth was observed in radiographic examination. Early loss of all primary teeth was mentioned by the parents.

**Results:** : The mean PPD after six month was 3.4 mm for the right side and 4.3 mm for the left side. The mean colony count reduction percentage was apparently greater in the right side compared to left side (93.5% versus 53.4%). It seems that PAD in combination with SRP had an additional benefit in the management of the generalized aggressive periodontitis in this case, although further studies are needed to prove this evidence.

**Conclusion:** : The mean PPD after six month was 3.4 mm for the right side and 4.3 mm for the left side. The mean colony count reduction percentage was apparently greater in the right side compared to left side (93.5% versus 53.4%). It seems that PAD in combination with SRP had an additional benefit in the management of the generalized aggressive periodontitis in this case, although further studies are needed to prove this evidence.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0931

### Arteriovenous Vascular Malformation of the Mandible: A case report

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**Aim:** Large arteriovenous malformations of the jaws are relatively rare and potentially life-threatening lesions. When the lesion is not suspected, extraction of teeth can be fatal. Intraosseous vascular malformations near the alveolar bone are often present with pericoronal bleeding, mobile teeth and sometimes occlusal anomalies. Gingival bleeding seems to be a symptom common to most documented cases. In the mandible and maxilla, the lesion produces a poorly defined, radiolucent image, often having the appearance of a honeycomb or soap bubbles, with small rounded and irregular lacunae.

**Material and Methods:** A 24-years-old patient was consulted to us for assessment of periodontal status. After periodontal assessment, although she had good oral hygiene, common gingival bleeding was observed. An addition, there were some mobile teeth and occlusal anomaly. Especially at the mandibular posterior molar region, non-hemorrhagic, gingival granulomatous swelling was noted. Scaling and polishing was performed. The patient was called maintenance phase.

**Results:** Treatment of arteriovenous malformations include selective embolization, surgical excision or both methods. Embolization, combined with surgical treatment, is still the most conventional modern approach.

**Conclusion:** Arteriovenous vascular malformations of the maxillofacial region sometimes give rise to dental emergencies and may cause disfigurement, morbidity, even death. Although vascular malformation is rare, the dentist must always consider the possibility and be able to recognize the clinical signs in order to propose proper treatment.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0932

### Perio-prosthetic management in aesthetic area using "cut back" lithia-disilicate-based (LS2) all ceramic crowns

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Milano/Italy

**Aim:** The purpose of the work was to evaluate the behaviour of the tissues around full-ceramic lithium disilicate crowns in the upper frontal group, in one complex perio-prosthesis case.

**Material and Methods:** In the upper jaw, after the first provisionals and the bone-resective periodontal surgery to restore the correct dento-periodontal relationship and re-create the symmetry between the gingival parables, during the healing period we placed the second provisionals. The diastema present in the first and second quadrant was closed by performing two composite inlays on the elements 1.4 and 1.6, and by means of a classic metal-ceramics bridge on 2.4 x 2.6. The group from 1.3 to 2.3, after the adhesive post-endodontic reconstructions (silica fiber posts), received all-ceramic lithium disilicate crowns (cut-back technique, CAD E-max Diadem). Finally, we have performed 3 feldspathic porcelain laminate veneers both to close the existing diastema and to realign the crowded elements 3.1, 4.1 and 4.2, and an additional composite veneer mesially to the item 3.2.

**Results:** The relationship between biological width, placement and type of the marginal prosthetic preparation, gingival biotype and the working area are factors that must be carefully considered, independently from the type of material used to perform the restoration.

**Conclusion:** We were able to process and adhesively cement the lithium disilicate crowns on the items from 1.3 to 2.3. We have found a very high level of gingival health, the absence of inflammation, a very natural and pleasant capability to transmit light both through the artifacts, and deep in the gums around the restoration themselves.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0933

### Survival of zirconia-based 2-unit resin-bonded FPDs on abutment teeth with no, moderate and advanced alveolar bone loss: In-vitro results of long-term preclinical and static loading.

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**Aim:** To evaluate endodontically treated maxillary central incisors with access cavity only and different extend of alveolar bone loss as abutments for two-unit anterior cantilever fixed partial dentures with zirconia frame work (2U-FPDs).

**Material and Methods:** Human maxillary central incisors (n=24) were endodontically treated and divided into 3 groups. Access cavities were rebuilt with composite cores. All specimens were restored with adhesively cemented veneered zirconia 2U-FPDs. Group I (control) simulated a clinical situation without, group II with 25% and in group III with 50% horizontal alveolar bone loss. For 10-year simulation of clinical function specimens were exposed to two subsequent sequences of thermal-cycling and mechanical loading (TCML; first sequence: 1.2x10<sup>6</sup> load cycles, 1-25N; second sequence: 1.2x10<sup>6</sup> load cycles, 1-50N and 2x3,000 thermal cycles between 5°/55°C, respectively). Kaplan-Meier survival curves were constructed and log-rank tests performed. Failure patterns were compared by Fisher's exact test (p=0.05). For specimens which survived chewing simulation subsequent linear loading was performed.

**Results:** Most specimens failed already during TCML. In groups with no (I), moderate (II) and advanced (III) bone loss debonding was the predominant type of failure with 5 (including one debonding with chipping), 5 and 7 specimens, respectively (p=0.278). Significant different survival rates were found neither after the first (p=0.593) nor second (p=0.287) sequence. Due to the low number of remaining specimens no statistical analysis was possible for subsequent linear loading. Again debonding was most frequently observed.

**Conclusion:** Ten-year preclinical load simulation revealed that alveolar bone loss had no impact on the survival of zirconia based 2-unit resin bonded FPD.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0934

### The multidisciplinary treatment of the pathologic tooth migration

S. Moon, J. Choi, S. Kim

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**Aim:** Introduction The pathologic tooth migration (PTM) most commonly occurs in the anterior region frequently found in advanced periodontal disease. The present case introduces the systematic approaches devised to successfully manage the complicated PTM. The treatment modalities encompass a

multidisciplinary periodontal, orthodontic, and prosthodontic treatment of a complicated PTM based on a logical scheme developed in our department.

**Material and Methods:** Case report A patient's maxillary anterior teeth demonstrated a severe extrusion, flaring and diastema resulting in a serious esthetic and functional impairment inherent from the advanced form of chronic periodontitis. At the completion of initial periodontal therapy, a Hawley bite plane was applied on posterior teeth to facilitate the orthodontic intrusion and approximation, and leveling of malaligned anterior teeth. There was no evidence of posterior bite collapse. For creating a positive gingival architecture from unpleasing negative gingival contour, gingivoplasty was performed by sculpting followed by fabrication of the two subsequent provisional restorations to optimize the papillary dimension and encourage the development of positive gingival contour. The final prosthesis was esthetically pleasing with restoration of an optimal occlusal function.

**Results:** Discussion Based on a sophisticated treatment scheme, a multidisciplinary management of PTM may be feasible in a predictable manner. Fine tuning of PTM that is devised to accommodate diverse situations may pave the way to solve various PTM.

**Conclusion:** With an assistance of posterior Hawley bite plane, the multidisciplinary treatment could provide a powerful tool for the realignment of the seriously compromised anterior dentition resulting in both esthetically pleasing and functionally acceptable

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0935

### Periodontitis associated with Plasminogen Deficiency: A Case Report

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**Aim:** Introduction: Plasminogen (PLG) is the proenzyme of plasmin - a key regulator of fibrinolysis. Plasmin also acts as a broad spectrum proteolytic factor and exerts crucial functions in tissue homeostasis and host immune response. Plasminogen deficiency is a rare autosomal recessive disease that is associated with recurrent, ligneous pseudomembranes on mucosal surfaces. Moreover, one third of the affected individuals suffer from severe progressive attachment loss and gingival enlargement. The previously described non-surgical and surgical treatment approaches have been described as unsuccessful.

**Material and Methods:** Case Report: The intraoral examination of a 17-year-old Turkish female with severe PLG- deficiency revealed generalized increased pocket probing depths ranging from 6 to 12mm, bleeding on probing, tooth mobility, and gingival hyperplasia. Porphyromonas gingivalis, Tannerella forsythensis, Treponema denticola, Prevotella intermedia, Prevotella nigrescens, and Eikenella corrodens have been detected by real-time PCR. Periodontal treatment consisted of full mouth disinfection (FMD) and a specific adjunctive systemic antibiotic therapy. 15 months following FMD the periodontal condition is improved with a drastic reduction of the gingival hyperplasia.

**Results:** Discussion: Previous studies indicate that external triggers, e.g. infections and mechanical manipulations induce



excess formation of pseudomembranes in patients with PLG-deficiency, contributing to the unsuccessful outcome following surgical therapy in PLG-deficiency cases. Moreover, the specific adjunctive antibiotic therapy may have potentiated the microbiological effects of the non-surgical therapy.

**Conclusion:** This case report indicates that non-surgical therapy in combination with an adjunctive specific antibiotic therapy results in a favourable outcome in patients with PLG-deficiency.

Topic: Clinical Tips and cases: Restorative aspects / General periodontology

## P0936

### Implants or damaged root-treated teeth as abutments for all-ceramic FPDs? In-vitro results of long-term preclinical loading.

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**Aim:** To utilize damaged endodontically treated teeth (ETT) as abutments, or whether it is more predictable to replace them by implants. Therefore, the in-vitro survival rate and load capability of zirconia two-unit anterior cantilever fixed partial dentures (2U-FPDs) were investigated on implants and severely damaged upper central incisors with different defect extensions and quartz-fiber post (QFP).

**Material and Methods:** Human maxillary central incisors (n=24) were endodontically treated and divided into 3 groups: (I) access cavities rebuild with composite core, (II) teeth decoronated and restored with composite core, and (III) teeth decoronated and restored with QFP and composite core. As a control (IV), implants with individual zirconia abutments were used. All specimens were restored with adhesively cemented veneered zirconia 2U-FPDs. For 10-year clinical simulation specimens were exposed to two subsequent sequences of thermal-cycling and mechanical loading (TCML; 2x [1.2x10<sup>6</sup> load cycles, 50N; 2x3,000 thermal cycles, 5°/55°C]). Kaplan-Meier survival curves were constructed and log-rank tests performed. Specimens which survived simulation were statically loaded until failure (v=1 mm/min).

**Results:** During TCML in group I two tooth fractures and two debondings with chipping were found. Solely chippings occurred in groups II (2x), IV (2x) and III (1x). No significant different survival rates were found either for the different abutments (p=0.085) or for the FPDs (p=0.526). Load capability differed significantly between group I (176N) and III (670N) (p=0.024), and groups III and IV (324N) (p=0.014).

**Conclusion:** Ten-year preclinical load simulation revealed that severely damaged, post-restored ETT and implants are both reliable abutments for zirconia 2U-FPDs.

Topic: Clinical tips and cases: Surgical therapy

## P0938

### Application of liquid nitrogen following surgical resection of PGCG

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Aleppo/Syria

**Aim:** Introduction: Peripheral Giant Cell Granuloma (PGCG) is a non-neoplastic lesion representing a local hyperplastic reaction to injury or inflammation. It's known to be a reactive soft tissue lesion, it's an infrequent reactive, also known as giant-cell epulis, osteoclastoma, giant cell reparative granuloma, or giant cell hyperplasia. It is more frequent in women than in men, PGCG have been documented in children where the lesion appears to be more aggressive.

**Material and Methods:** Case report: Three cases of PGCG including patient, with an age less than 10 years-old, no systemic diseases and no previous medical or surgical treatment. All patients were treated with surgical resection of lesions. The histological examination confirms the diagnosis of PGCG in all cases. Liquid nitrogen with open spray have been applied directly on resection site. All cases recalled every six months; no recurrence showed within 18 months.

**Results:** Discussion: Early detection and surgical resection of this lesion is important to minimize potential dentoalveolar complications. According to the statistics the recurrence rate of PGCG after surgical resection is approximately 10%. Liquid nitrogen have been used successfully alone or associated with other surgical methods in various types of oral lesions, (gingival pigmentations, pyogenic granuloma, leucoplakia, fibroma, etc.).

**Conclusion:** Liquid nitrogen would be a recommended modality to prevent recurrences of PGCG resection without causing cosmetic deformity.

Topic: Clinical tips and cases: Surgical therapy

## P0939

### Second stage implant surgery: a periodontal approach

F. Buono, L. De Micheli, C. Coraini

Milano/Italy

**Aim:** The integrity of the peri-implant soft tissues is very important for the long-term maintenance of osseointegration. When an implant is exposed in the oral cavity, the body creates a mechanical barrier to bacterial penetration, similar to the structure of the periodontium. This structure is called the biological width. The aim of this work is to describe the surgical techniques to ensure the correct proportion and position of the peri-implant soft tissues during second stage surgery.

**Material and Methods:** The first case is a second step implant surgery with apical repositioning of the flap. The second case is a second stage implant surgery with a connective tissue graft positioned to the buccal side of the implant, augmenting thickness of the soft tissue. The third case is a second surgery to uncover implants and to put an epithelium connective graft around the implant's buccal side. The fourth case is a second stage implant surgery using the "operculum" technique due to the presence of a large quantity of keratinized gingiva.

**Results:** We observed that there are no common guidelines regarding soft tissue management during second stage surgery. Our clinical experience showed that the presence of keratinized gingiva promotes better health tissue while, often, the presence of alveolar mucosa can be associated with inflammatory processes.

**Conclusion:** The correct management of the peri-implant soft tissues is indispensable to the aesthetic and health of the implant-prosthetic rehabilitation, thereby increasing predictability and long term results.

Topic: Clinical tips and cases: Surgical therapy

## P0940

### a case of peripheral ossifying fibroma

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Istanbul/Turkey

**Aim:** Peripheral ossifying fibroma (POF) is a lesion of gingival tissue that predominantly affects women and is usually located in maxillary premolars and molars. Most of the lesions typically show slow and expansile growth. The treatment of POF is surgical removal of the mass and the elimination of the local irritant factors. The recurrence rate is %8-20.

**Material and Methods:** In February 2011, a 21 years old non-smoker female patient applied to the Department of Periodontology, University of Istanbul, complaining about a mass in her gingiva neighbouring the tooth 21. She had no history of any systemic disorders or medications. The mass rose 3 months ago and showed a slow progress. The lesion was pedicular and the surface texture was slightly irregular. The growth measured 3 cm in size and was extending out from marginal gingiva. There were no significant radiographic findings. Under local anesthesia, the lesion was totally excised. The histopathologic report confirmed and established the diagnosis as POF. There were no signs of disease 6 months after the treatment

**Results:** POFs rise rarely from marginal gingiva without any relation with neighbouring periodontal ligament and bone. Contrary to usual, this case also did not show any local chronic irritant factors like calculus, misprepared fillings or prosthesis. Differential diagnosis of POF should include pyogenic or peripheral giant cell granulomas.

**Conclusion:** The treatment of POF is total surgical removal of the lesion and the prognosis is known to be fair and recurrence seems to be unusual.

Topic: Clinical tips and cases: Surgical therapy

## P0941

### Split-crest technique using Piezosurgery and bone expanders for implant placement in atrophic mandible

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Gandia (valencia)/Spain

**Aim:** Introduction: Alveolar split-crest technique consists in a cutting of the bone in two segments, separating facial and lingual cortices. It is used in atrophic narrow ridges when the space is unable to place dental implants. It is an alternative for regenerative surgery. Anatomically, mandible difficulties the application of this technique due to hardness of both corticals, and by the external oblique line.

**Material and Methods:** Case report: Objectives: analyze last publications related with this technique through bibliographic research in Medline and illustrate it with a clinical case. Treatment description: female, 50 years old. Insertion of two implants Pemium Khono 3.8 x 10 (Sweeden-Martina) in place of 45 and 47. Due to self-taping capacity of the implant trade-mark used the own implant acts like final crest's expander, separating both corticals. In the same way the design allows an adequate first stability necessary for the treatment success. The technique requires a corticotomy into the bone using both Piezosurgery and thread expanders. The gap between both corticals, at the same time implants were placed, was filled with bone graft and covered by resorbable membrane. Evolution: after 6 months osseointegration period a screw implant-supported bridge were placed.

**Results:** Discussion: this technique is an alternative for the regenerative surgery.

**Conclusion:** the technique allows for expansion of narrow, anatomically limiting, atrophic ridges, creating space for immediate implant placement. Facial and lingual cortices, provides support with vital osteocytes for osteogenesis. This may allow shortening of treatment time with elimination of donor site morbidity and may prevent neurosensory deficiencies.

Topic: Clinical tips and cases: Surgical therapy

## P0942

### Root coverage using the tunnel technique and a new 3D collagen matrix

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**Aim:** Several surgical techniques have been introduced to treat gingival recession, including connective tissue grafting, various flap designs or guided tissue regeneration. More recently, the use of 3D collagen matrices of porcine origin has been introduced to soft tissue grafting. The aim of this report is to describe the application of the tunnel technique, with the use of a new 3D collagen matrix, in the treatment of single and multiple gingival recessions.

**Material and Methods:** Several patients diagnosed with single and multiple Miller class I tissue recessions were treated by the tunnel technique and a novel 3D collagen matrix (Mucoderm®, Botiss Dental, Berlin, Germany). The collagen matrix was inserted into a supraperiosteal pouch and recipient site and sutured.

**Results:** Postoperative wound healing was uneventful in all cases. Subsequent follow up examinations of the surgical sites revealed excellent and stable root surface coverage.

**Conclusion:** The tunnel technique with the use of a novel 3D collagen matrix was used successfully for the treatment of single and multiple gingival recessions showing an increase of soft tissue volume and gain of keratinized tissue.

Topic: Clinical tips and cases: Surgical therapy

## P0944

### Treatment management under general anesthesia of anticonvulsant induced gingival overgrowth in a 17 years old mental retarded patient (A case report)

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**Aim:** Anticonvulsant drugs generally are used in patients with epilepsy and are known as a ethyologic factor for gingival overgrowth. Mental condition of the patients also directly effect their oral hygiene condition and also severity of gingival overgrowth. The purpose of this study was to acquire the functions of chewing the patient under general anesthesia.

**Material and Methods:** A 17 years old with gingival overgrowth was referred to the department of periodontology. A detailed dental and medical history and clinical examination confirmed the systemic condition. surgical treatment is generally contraindicated in patients who can not control plaque. however , patients with mental retardation was treated surgically because of nutrition was prevented by exessive gingival overgrowth. After nonsurgical periodontal therapy and surgical phase were performed with general anastesia.

**Results:** At the end of one year period, gingival overgrowth was not recurrence in the patient.

**Conclusion:** in this case, treat with under general anesthesia was provided convenience for the patient and physician. It has reached a successful conclusion

Topic: Clinical tips and cases: Surgical therapy

## P0945

### Clinical efficacy of DERMA® extracellular matrix in augmenting keratinized tissue before dental implants placement. A Case report.

L. Sala, O. Hidalgo, V. García-García, L. Pèrez, A. Carrillo, J.M.

Aragoneses

Madrid/Spain

**Aim:** The need for keratinized gingiva around dental implants is nowadays a controversial issue. Recent studies indicate weak scientific evidence to assess whether peri-implant keratinized mucosa around dental implants is needed or not. However, it is often preferred if implants are surrounded by a sufficient width of attached/keratinized mucosa to allow their maintenance. Obtaining palate grafts is the gold standard technique to increase keratinized tissue. In order to reduce patient morbidity due to donor site, biomaterials like DERMA (porcin acellular dermal matrix) are emerging as possible replacements for autogenous tissue.

**Material and Methods:** We present the case of a 54 year-old woman without relevant medical history or known allergies,

wearing a lower removable prosthesis, that came for rehabilitation of the lower jaw with dental implants prosthesis. At the clinical examination we observed the presence of 1mm of keratinized gingiva. The radiographic examination showed insufficient bone for placing implants in posterior sites. Consequently, we planned the placement of 4 interforaminally implants after augmentation of keratinized tissue by using DERMA membrane, in order to place an overdenture.

**Results:** A crestal incision was made and a full-thickness flaps were raised to place and fix the membrane. After 4 months of healing the 4 interforaminally implants were placed and 8 weeks later a second stage surgery was performed. Finally an overdenture was placed.

**Conclusion:** The use of DERMA seems to be useful to achieve an increase in keratinized gingiva and decrease patient morbidity.

Topic: Clinical tips and cases: Surgical therapy

## P0946

### Clinical efficacy of DERMA® extracellular matrix in augmenting keratinized tissue before dental implants placement. A Case report.

L. Sala, O. Hidalgo, V. García-García, L. Pèrez, A. Carrillo, J.M.

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**Conclusion:** The use of DERMA® seems to be useful to achieve an increase in keratinized gingiva and decrease patient morbidity.

Topic: Clinical tips and cases: Surgical therapy

## P0947

### Using of Platelet Rich Fibrine with Coronally Advanced Flap in the Treatment of Gingival Recession: A Case Report

E. Saglam, T. Arabacı, M. Yavuz, M. Terzi, S. Akman  
Erzurum/Turkey

**Aim:** Coronally advanced flap (CAF) is shown to be a predictable method for treatment of the gingival recession. It is a relatively easy for the patient and the clinicians. We aimed to report root coverage (RC) procedure, using coronally advanced flap (CAF) in combination with platelet rich fibrine (PRF) which is a new alternative to connective tissue grafts.

**Material and Methods:** Twenty four years old female patient who has vestibular gingival recession at mandibular canina and first premolar teeth consult to our department. Advanced flap and PRF technique applied for root coverage. Patient motivated about oral hygiene practise and protect the surgical region from trauma. One month later examination showed that the recession was decrease 2 mm. at the canina and 1 mm. at the first premolar. Patient follow-up is continued.

**Results:** Recent studies have shown that the percentage of root coverage with CAF varies between 34% and 86.67%. Using of connective tissue grafts together with CAF reported to increase the success of the treatment. However, connective tissue graft technique is difficult to obtain and effect the postoperative patient comfort. Therefore platelet rich fibrine (PRF) is used together with CAF to promote healing and increase clinical outcomes

**Conclusion:** The success of surgery depends on oral hygiene, traumatic tooth brushing, smoking, width and depth of the recession, flap thickness and clinician-related factors. All of these factors subsequently affect post-operative wound healing.

Topic: Clinical tips and cases: Surgical therapy

## P0948

### A patient with epidermal cyst in mandibula, simultaneously enucleation of epidermal cyst and implant placed. (A Case Report)

M. Terzi, M. Yavuz, E. Saglam, C.F. Canakci  
Erzurum/Turkey

**Aim:** Epidermal cysts are surrounded by keratinized squamous layer and filled with keratin debris. They can be seen anywhere and they are real cysts. They are painless slow growing lesions which are smooth surfaced. The aim of this treatment, without second surgical procedure and with shortened wait time provide rehabilitation of oral health.

**Material and Methods:** Radiographic examination, the left posterior region of the mandible of a radiolucent lesion with regular margins. cyst was enucleated and simultaneously dental implant was placed with biomaterial.

**Results:** While following The condition of the patient, no pathological and inflammation data were observed

**Conclusion:** instead of waiting for the recover of the bonds, by applying dental implant, the patient has reached his oral health immediately..

Topic: Clinical tips and cases: Surgical therapy

## P0949

### Sinus Augmentation Using Collagenated Corticocancellous Bone Grafts with and without Autogenous Bone: Case series

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<sup>1</sup>Istanbul/Turkey, <sup>2</sup>Istanbul/Turkey

**Aim:** The purpose of this study was to evaluate the radiographic and histologic results of collagenated corticocancellous porcine bone (CCPB) with and without 25% autogenous bone (AB) in bilateral sinus augmentation.

**Material and Methods:** Six patients with  $\leq 5$  mm of residual alveolar bone height in the posterior maxilla underwent sinus augmentations performed by using CCPB+AB combination or CCPB alone. Following grafting, a resorbable membrane (RM) was used to cover the lateral bony window on both sides. Cone beam computerized tomography (CBCT) was used to visualize ridge heights before and immediately after the surgery. CBCT measurements were repeated at 8 months before implant placement. Bone biopsies were obtained from the grafted areas during implantation.

**Results:** Wound healing was uneventful on both sites. Baseline ridge heights at CCPB+AB+RM site increased from  $3,57 \pm 1,79$  mm to  $12,35 \pm 3,84$  mm whereas at the other site from  $3,59 \pm 1,94$  mm to  $11,18 \pm 5,48$  mm immediately after the augmentations and at 8 months, ridge heights were  $10,57 \pm 5,04$  mm and  $8,31 \pm 3,79$  mm, respectively. Average ridge heights at baseline, immediately and 8 months after the augmentation were similar in both treatment sites. The amount of increase in ridge heights immediately after the augmentations were significant at both sites. However, site treated with CCPB alone revealed significant graft resorption after 8 months. Histological and histomorphometrical analysis showed that the area presenting new bone formation was significantly higher at CCPB+AB+RM site.

**Conclusion:** Within the limits of this study it has been shown that sites augmented with CCPB presented considerable loss of ridge heights over 8 months time.

Topic: Clinical tips and cases: Surgical therapy

## P0950

### Three-year clinical follow-up of a single tooth replacement with plateau design short implant.

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<sup>1</sup>Salvador/Brazil, <sup>2</sup>Boston/United States of America

**Aim:** Osseointegrated dental implants are an effective alternative in the rehabilitation of partial or total edentulous patients. The aim of this clinical case is to present the replacement of a single tooth with limited prosthetic space using a plateau design short implant.



**Material and Methods:** A 65 years-old female searched for a single tooth replacement at the 25 region (FDI notation) at the Federal University of Bahia-Brazil Dental School. She remained with an edentulous space during approximately one year. Due to the limited prosthetic space a 4X8mm (HA coated) locking taper (LT), plateau design (PD) and sloping shoulder (SS) implant has been selected (Bicon Dental Implants, Boston, USA). The implant has been placed 2.0mm below the bone crest during surgical stage, following manufacturer's protocol. An Integrated Abutment Crown™ was taped in six months after implant placement. The occlusion has been checked and adjusted.

**Results:** A three-year follow-up periapical radiographic image revealed no marginal bone loss. Clinically, the presences of aesthetically acceptable tooth-implant papillae and soft tissue contour were evident. The patient agreed in participating in the clinical case by means of a written consent.

**Conclusion:** Properties as the bacterial seal of the LT and particularly, the lamellar bone formation at a supra-implant level as a consequence of the PD and the SS of the neck of the implant might have contributed to the bone quality at the supra-implant area. Thus, allowing sufficient space for papillae formation, in this clinical case.

Funding Source: Bicon Dental Implants

Topic: Clinical tips and cases: Surgical therapy

**P0951**

**Gingival enlargement drug-induced: case report.**

S. Chemlali, J. Kissa

Casablanca/Morocco

**Aim:** Gingival enlargement is the term used to describe medication-related gingival overgrowth or gingival hyperplasia, a common reactionary phenomenon that occurs with the use of 3 types of drugs: anticonvulsants (phenytoin), immunosuppressive agents (cyclosporine A) and various calcium channel blockers for cardiovascular diseases. This disorder has been recognized since 1939, shortly after the introduction of phenytoin. Drug-induced gingival enlargement is classified by the American Academy of Periodontology as a dental plaque-induced gingival disease.

**CASE REPORT:** A case of phenytoin-induced gingival enlargement has been reported herein in a 38-year-old female patient. Periodontal examinations, surgical procedures, and dental hygiene with follow-up are an essential part of the treatment protocol. However, additional effort is needed from the patient. **DISCUSSION:** It is important that the health practitioner become aware of the potential etiologic agents of drug induced gingival enlargement and its characteristic features in order to be able to prevent, diagnose and successfully manage it.

**Conclusion:** Prevention and treatment includes meticulous plaque control and frequent professional debridement combined of surgical gingivectomy was used to remove the gingival overgrowth.

**Material and Methods:** CASE REPORT: A case of phenytoin-induced gingival enlargement has been reported herein in a 38-year-old female patient. Prevention and treatment includes meticulous plaque control and frequent professional debridement combined of surgical gingivectomy was used to remove the gingival overgrowth.

**Results:** **DISCUSSION:** Periodontal examinations, surgical procedures, and dental hygiene with follow-up are an essential part of the treatment protocol. However, additional effort is needed from the patient.

**Conclusion:** : Prevention and treatment includes meticulous plaque control and frequent professional debridement combined of surgical gingivectomy was used to remove the gingival overgrowth.

Topic: Clinical tips and cases: Surgical therapy

**P0952**

**Extraoral endodontic surgery- a case report**

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Graz/Austria

**Aim:** We present a case of a successful extraoral endodontic surgery of a second lower molar after extraction and intentional replantation.

**Material and Methods:** A 16-year old patient presented because of an unsuccessful endodontic treatment of the tooth 47. The periodontal sounding was uneventful. A preoperative panoramic radiography revealed a periapical lesion reaching from the apices to the nervus alveolaris inferior. The tooth 47 was gently removed and stored for 20 minutes in a nutrition medium. An extraoral apicoectomy was performed, followed by a retrograde root canal treatment. After disinfection the root canal was dried and filled with IRM- cementum (IRM-Caps, Dentsply, Konstanz, Germany). A curettage of the periapical region of the bone was performed and the tooth was replanted and extendedly fixed to the adjacent tooth 46. An antibiotic and a pain medication was ordered for five days. The fixture was removed 17 days after surgery.

**Results:** 4 months after surgery a radiography was again performed showing the healing process of the periapical lesion and giving no signs of periodontal damage. The patient felt no more pain and a definitive restauration will be initiated.

**Conclusion:** If possible, extraoral endodontic surgery may be favourable especially in the lower molar region.

Topic: Basic Research: Biomaterials and Surfaces

**P0953**

**Cleaning effect of cavitating jet on titanium surface**

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**Aim:** The decontamination of implant surface is critical to suppress inflammation of soft tissue surrounding dental implant or to obtain re-osseointegration in patients with peri-implantitis. Although some cleaning devices were developed, more effective methods are expected to eliminate the bacteria from implant surface. The impact generated by a cavitating jet, i.e., a water jet with cavitation bubbles, is used for metal peening, decomposition and oxidization of organic compounds. The purpose of this study was to estimate the effect of cavitating jet for removal of debris from titanium surface.

**Material and Methods:** The optimal conditions for cavitating jet (e.g. diameter of the nozzle, , pressure, p, length of the nozzle, , standoff distance, s) were identified by cavitation impact measurement, that was carried out in Tohoku University. To evaluate the cleaning efficacy, the percentage of remaining artificial plaques on material plates were calculated by computer image analyses. For examination of decontamination, titanium plates were infected with *S. mutans* GS-5 cultured in THB broth at 37 °C for 48 hours. The decontaminated titanium surfaces were observed by using a scanning electron microscope (SEM).

**Results:** The intense cavitation was obtained with  $\phi=0.56\text{mm}$ ,  $p=0.5\text{MPa}$ ,  $\ell=5\text{mm}$ , and  $s=2\text{mm}$  by cavitation impact measurement. Significant decrease of artificial plaque with cavitating jet was determined comparing to simple water jet. Remarkable removal of bacteria from titanium plates were observed with SEM.

**Conclusion:** This study demonstrated that cavitating jet could be one of the optimal methods for removal of debris from titanium surface.

Topic: Basic Research: Biomaterials and Surfaces

## P0954

### Platelet-rich fibrin increases cell attachment, proliferation, and differentiation of human osteoblasts

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**Aim:** Platelet-rich fibrin (PRF) by Choukroun's technique is derived from an autogenous preparation of concentrated platelets without any manipulation. It is a relative new application of tissue engineering and a developing area for researchers and clinicians. This study was to determine the effects of PRF on the cell attachment, proliferation, differentiation, and the expression of alkaline phosphatase (ALP) on osteoblasts.

**Material and Methods:** Blood collection was carried out from ten healthy volunteers. The PRF samples were obtained from PC-02 table centrifuge centrifuged at 3,000 rpm for 12 min. Cell attachment and proliferation were measured by colorimetric assay with WST-1 and alamar blue in human osteoblast cell line U2OS cells, respectively. von Kossa staining and mineralization nodules counts were performed at 1, 7, 14, and 21 days. ALP activity was examined by substrate assay.

**Results:** PRF alone was found to stimulate U2OS cell attachment as compared with untreated controls ( $p<0.05$ ). PRF was found to increase osteoblast proliferation during 5 day incubation period ( $p<0.05$ ). PRF alone was found to stimulate U2OS cell osteogenic differentiation by von Kossa staining. ALP activity was significantly upregulated by PRF as compared with untreated controls ( $p<0.05$ ).

**Conclusion:** PRF was demonstrated to stimulate osteoblast attachment, proliferation, differentiation, and ALP activity. The application of PRF may provide the benefit for bone regeneration.

Topic: Basic Research: Biomaterials and Surfaces

## P0955

### Ultrasonic insonification to titanium surface by non-contact tip in small area

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**Aim:** Ultrasonic scaler is a device that is essential to everyday clinic work. A lot of tips were developed for scaling or removal of stain. On the other hand, those contact-type tips are not enough for cleaning of sulcus between thread ridges or rough surface. The purpose of the present study was to evaluate the effect of ultrasonic emission to dental implant and titanium specimens for removing surface debris.

**Material and Methods:** 57 kHz ultrasonic wave was generated by piezoelectric ceramics and transmitted to the titanium surfaces with curved hone and small cover. To evaluate the cleaning efficacy, the remaining artificial plaques on material plates were examined by computer image analyses. The surfaces of titanium surfaces were infected with in vitro cultured *S. mutans* GS-5 strain at 37°C for 2 days. After application of ultrasonic wave of 5W/cm<sup>2</sup> for 10 sec, the surfaces were observed by scanning electron microscope (SEM).

**Results:** In the area of concave surfaces, significant decrease of artificial plaque with insonification was determined comparing to the dental ultrasonic scaler. With quick insonification of low frequency ultrasound, remarkable removal of bacteria also was confirmed with SEM.

**Conclusion:** This study demonstrated that non-contact ultrasonic insonification could be one of the optimal methods for removal of debris from titanium surface.

Topic: Basic Research: Biomaterials and Surfaces

## P0956

### Influence of wear, drill composition and irrigation in bone temperature generated in implants preparation: an in vitro study

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**Aim:** One factor critical to the success of dental implant osseointegration is the avoidance of thermally induced necrosis at the osteotomy site. The objective of the study was to evaluate the influence of the wear of two different types of drill and the irrigation in bone temperature generation

**Material and Methods:** Bovine ribs with uniform thickness of cortical bone were used to drill with two different drills, group A: Precipitation-hardening martensitic stainless steel, and group B: Martensitic stainless steel. Three sequences of four drills were used 100 times with and without irrigation. Temperature was recorded with a termopar (Thermodigit PM=3900) immediately after every two times drills

**Results:** The mean bone temperature with irrigation was AI=17,58±0,95 (drill A with irrigation), BI=16,66 ±0,37 (group B with irrigation), without irrigation ANI=23,58±0,84 (group

A without irrigation),  $BNI=19,41\pm0,65$  (group B without irrigation), the differences was statistical significant between group ANI versus group BI and group AI ( $p<0,05$ , Kruskal Wallis test). The changes in temperature between the first drill and hundredth drill was  $AI=3,41\pm1,21$ ,  $BI=-1,16\pm0,69$ ,  $ANI=0,33\pm0,58$ ,  $BNI=0,66\pm0,44$ . The temperature changes through the hundred drills were calculated with a coefficient of variation  $AI=5,6\%$ ,  $BI=5,1\%$ ,  $ANI=9,4\%$ ,  $BNI=9,3\%$

**Conclusion:** The types of drill used influence the bone temperature, the irrigation produce lower bone temperature, the temperature changes were higher without irrigation, the drill wear influence does not substantially affect bone temperature.

Topic: Basic Research: Biomaterials and Surfaces

## P0957

### Pharmacological inhibitors of the prolyl hydroxylase show a burst release kinetic when lyophilized onto bone substitutes

L. Hueber, H. Agis, R. Gruber  
Vienna/Austria

**Aim:** Pharmacological inhibitors of the prolyl hydroxylase (PHD) can induce a pro-angiogenic response that favors wound healing and bone regeneration. We asked whether bone substitutes can serve as carriers for PHD inhibitors.

**Material and Methods:** We lyophilized three PHD inhibitors - dimethyloxallyl glycine, desferrioxamine and L-mimosine - onto inorganic bone mineral (BioOss®) and hydroxyapatite. We then determined the release kinetic of the PHD inhibitors with a bioassay using periodontal fibroblasts. Vascular endothelial growth factor (VEGF) produced by periodontal fibroblasts in response to released PHD inhibitors was evaluated by immunoassays. Viability and proliferation of periodontal fibroblasts were assessed by MTT and  $^3[H]$ thymidine incorporation assays, respectively.

**Results:** We found that BioOss® and hydroxyapatite cause a similar burst-like release kinetic of all PHD inhibitors that lasts for over 24 to 48 hours. Cell viability and proliferation were only slightly reduced by the released PHD inhibitors.

**Conclusion:** Our results suggest that PHD inhibitors released from bone substitutes at a similar kinetic provoke the production of VEGF by periodontal fibroblasts. These data provide the basis for our preclinical studies to determine the impact of bone substitutes loaded with PHD inhibitors on graft consolidation.

Topic: Basic Research: Biomaterials and Surfaces

## P0958

### Prolyl hydroxylase inhibitors decrease osteoclast formation and activity in murine bone marrow cultures

P. Vinzenz, S. Schröckmair, H. Agis, R. Gruber  
Vienna/Austria

**Aim:** Pharmacological inhibitors of the prolyl hydroxylases (PHD) can enhance bone regeneration; however, the impact of PHD

inhibitors on osteoclast activity is not entirely clear. In this study we assessed whether PHD inhibitors can affect osteoclastogenesis and osteoclast activity.

**Material and Methods:** We induced osteoclastogenesis in murine bone marrow cultures in the presence of PHD inhibitors. The formation of tartrate resistant acid phosphatase (TRAP) positive multinucleated cells and the resorption activity were determined. To test for possible toxic effects we measured proliferation of macrophage-colony stimulating factor (M-CSF)-dependent osteoclast progenitor cells.

**Results:** We found that PHD inhibitors reduced the number and activity of TRAP positive multinucleated cells and the overall resorption. Moreover, PHD inhibitors decreased proliferation of M-CSF-dependent progenitor cells. Also BioOss® and hydroxyapatite supplemented with PHD inhibitors reduced TRAP positive multinucleated cell number and proliferation of M-CSF-dependent progenitor cells.

**Conclusion:** In conclusion, our results show that PHD inhibitors can reduce osteoclast formation and activity in murine bone marrow cultures.

Topic: Basic Research: Biomaterials and Surfaces

## P0959

### Cytotoxicity of luting cements – an in vitro testing on human gingival fibroblasts

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**Aim:** The present study compared the cytotoxicity of three commonly used luting cements: Harvard zinc phosphate cement, GC Fuji Plus resin-modified glass-ionomer and RelyX Unicem Aplicap resin cement

**Material and Methods:** The sample included 24 specimens in each of four groups: three groups were for testing luting cements, one - for negative control. An outcome measure was the number of fibroblasts surviving after exposure to either luting cements or negative control. Cells were cultured under typical culturing conditions and the cell suspension was inoculated into each well of 96-well plates. A colorimetric assay of tetrazolium reduction (MTT method) was used to assess the cytotoxicity after 12 and 24 hours. In addition, cell viability was estimated by fluorescence microscopy after staining with ethidium bromide/acridine orange dye mixture. The cytotoxic effects among four groups (one for each of luting cements and one for negative control) were compared employing one way ANOVA with Dunnett Post Hoc adjustment.

**Results:** The cytotoxicity of all luting cements differed highly statistically significantly when compared to negative controls ( $P<0,001$ ), i.e. all luting cements exerted strong suppression of cellular mitochondrial activity. Specifically, the highest cytotoxicity was noted for RelyX Unicem Aplicap resin cement, followed by GC Fuji Plus resin-modified glass-ionomer while the lowest cytotoxicity was observed for Harvard zinc phosphate cement. Thus, the aforementioned luting cements may be characterised as biologically unfriendly materials.

**Conclusion:** The in vitro testing showed that Harvard zinc phosphate cement, GC Fuji Plus resin-modified glass ionomer and RelyX Unicem Aplicap resin cement have cytotoxic potential on human fibroblasts.

## Topic: Basic Research: Biomaterials and Surfaces

**P0960****Influence of blood components and human saliva on microbial adhesion of *Streptococcus sanguinis* to activatable dental implant surfaces**

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**Aim:** Novel surface modifications of dental implant biomaterials were focused during recent years to improve osseointegration and the prevention of microbial deposition transgingivally. In this study the adhesion of *Strept. sanguinis* was investigated on: anatase-coated titanium before and after UV-irradiation and titanium in the presence of serum, plasma and sterile saliva.

**Material and Methods:** *Strept. sanguinis* suspended in human plasma, serum or sterile saliva was exposed to 1) UV-activated anatase samples, 2) anatase samples non-activated (A) and 3) titanium surfaces (Ti) in a preclinical biofilm model for 60min. The initial biofilms were characterized determining microbial vitality and surface coverage of attached streptococci. The data were analysed statistically using 95% confidence intervals and Tukey-Kramer-test.

**Results:** Among the implant biomaterials the microbial vitality of initial biofilms on UV-A and non-activated A showed statistically significant higher values in the presence of saliva compared to the biofilms exposed to plasma and serum. Concerning the cell density on adhesion substrata the highest cell coverage on Ti, UV-A and A could be observed in the salivary environment.

**Conclusion:** The composition and nature of the protein-rich fluids as saliva, blood plasma and serum seemed to have an important impact on the interactions of exposed *Strep. sanguinis* to modified titanium surfaces.

## Topic: Basic Research: Biomaterials and Surfaces

**P0961****Boneregenerative effect of biphasic calcium phosphate-collagen composite block loaded with rhBMP-2 for vertical bone augmentation in a rabbit**J. Yun<sup>1</sup>, J. Kim<sup>2</sup>, I. Jung<sup>1</sup>, C.M. Jun<sup>1</sup>, N. Oh<sup>1</sup>, S. Choi<sup>2</sup>, K. Cho<sup>2</sup><sup>1</sup>Incheon/Korea, <sup>2</sup>Seoul/Korea

**Aim:** Block type biphasic calcium phosphate (BCP) carriers are more advantageous for delivering recombinant human bone morphogenetic protein-2 (rhBMP-2) in various clinical situations than particle type, due to excellence of three-dimensional bone regeneration. The aim of present study was to confirm the bone regenerative capabilities of the lower HA/ $\beta$ -TCP ratio (20/80) three-dimensional BCP blocks combined with the collagen (10 wt%) as a rhBMP-2 delivery system in craniofacial vertical bone augmentation model.

**Material and Methods:** The BCP block (average macropore size of 296 $\mu$ m) and BCP-Collagen block (average macropore size of 390 $\mu$ m) with or without rhBMP-2 were fixed with osteosynthesis screws on the calvarial surface of New Zealand rabbits. After

8 weeks, the histologic and histomorphometric analysis was performed to evaluate new bone area, augmented area, bone density and integration rate.

**Results:** The specimens containing rhBMP-2 had significantly higher amounts of new bone area than control group ( $p < 0.05$ ). BCP-Collagen/rhBMP-2 group exhibited significantly greater values of area fraction of newly formed bone within augmented area and integration rate between regenerative bone and calvarium than BCP/rhBMP-2 group ( $p < 0.05$ ) whereas both carrier systems showed similar release profile of rhBMP-2 with sustained and linear release during 2 weeks. The BCP blocks with or without rhBMP-2 exhibited excellent structural integrity while large fragments of ceramic had been remained.

**Conclusion:** In conclusion, the BCP-Collagen composite block showed enhanced osteoinductive potential and could be a good candidate for carrier of rhBMP-2 due to favorable volumetric stability, clinically easy handling feature and excellent remodeling property. \*Acknowledgement This study was supported by INHA UNIVERSITY Research Grant. (INHA-42833)

## Topic: Basic Research: Biomaterials and Surfaces

**P0962****Implant stability evaluation of a modified implant surface**C. Lima<sup>1</sup>, R. Faria-Almeida<sup>1</sup>, P. Lazaro<sup>2</sup>, M. Herrero<sup>2</sup><sup>1</sup>Porto/Portugal, <sup>2</sup>Seville/Spain

**Aim:** The aim of this clinical study is the implant stability evaluation of two different Straumann implant surfaces (SLA surface and modified SLA surface) by means of resonance frequency analysis, during the first six weeks of bone healing.

**Material and Methods:** Forty nine implants were placed in nineteen adult patients. In the SLA surface group were placed twenty two implants and in the modified SLA surface group were placed twenty seven implants. Implants dimensions varied between 8, 10 and 12 mm of length and 4,1mm and 4,8 mm in diameter. Osstell Mentor<sup>TM</sup> was used to evaluate implants stability in the day of implant placement and six weeks after surgery.

**Results:** The statistical analysis reveals that 84% of implants were placed in the posterior mandible. The median implant stability in SLA group was 64 ISQ in implant placement and 61 ISQ after six weeks. This results are statistical different from modified SLA group (79 ISQ in implant placement and 79 ISQ after six weeks).

**Conclusion:** This study results confirm that modified SLA surface positively influences the osseointegration process. There is a need of more randomized controlled clinical trials with superior follow-up and implant number.

## Topic: Basic Research: Biomaterials and Surfaces

**P0963****Implant Surface Decontamination Methods. A Scanning Electron Microscopic Evaluation.**T. Rapoport<sup>1</sup>, D. Weitz<sup>1</sup>, J. Caton<sup>1</sup>, J. Wernisch<sup>2</sup>, G. Romanos<sup>1</sup><sup>1</sup>Rochester/United States of America, <sup>2</sup>Vienna/Austria



**Aim:** The aim of this study was to compare possible alterations in titanium surfaces after the use of different treatment methods

**Material and Methods:** 40 titanium (machined and SLA) discs were "cleaned" (mimic scaling of an implant surface) using different methods: Conventional Gracey curette, titanium, plastic curettes, SONICflex device (KaVo), Ultrasonic devices (NSK and Cavitron, Dentsply) with special plastic tips, CO<sub>2</sub> laser (2W, Pulsed mode), Er:YAG laser (Kavo, at 100 mJ/pulse and 10 pps) and 980nm diode laser (KaVo, 2w power setting, non-contact mode). The disc surfaces were observed using scanning electron microscopy (SEM).

**Results:** Qualitative SEM observations showed that among all cleaning methods tested, the use of ultrasonics with special plastic tips, the CO<sub>2</sub> and 980nm diode laser methods and the use of SONICflex, left a smoother surface on both machined and SLA titanium surfaces.

**Conclusion:** Various cleaning methods affect titanium surfaces in different ways. The use of various modern sonic technologies, may provide smoother implant surfaces than other methods of decontamination.

Topic: Basic Research: Biomaterials and Surfaces

P0964

**In vivo performance of a novel nanoHA**

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**Aim:** In vivo bone regeneration evaluation of a novel synthetic nanocrystalline hydroxyapatite (nHA).

**Material and Methods:** Twenty male New Zealand White rabbits were equally divided in two groups (Group 1 and 2) according different experimental periods (2 and 4 weeks respectively). Delayed-size defects were created per rabbit in each parietal bone. Randomization defines the test material (nHA), xenograft (Bio-Oss®), autograft (positive control) or left empty (negative control). Histomorphometric analysis was assessed on undecalcified sections and statistical analysis was done with ANOVA one-way and post-hoc test.

**Results:** For 2 and 4 weeks period, in terms of new bone volume (NBV/TV), autograft results were 20,45±8,6% and 33,35±5,6% , xenograft 11,2±3,7% and 19,45±5,1% and nHA 12,13±2,8% and 19,73±6,8%, respectively. For 2 and 4 weeks period, the total area of mineralizes tissue (NBV+PV/TV), autograft results were 35,14±12,174% and 48,69±10,181% respectively, xenograft 29,32±6,553% and 34,34±4,810% respectively , and nHA 31,29±9,171% and 40,53±8,846% respectively. At 4 weeks significant differences were found between the tested materials, with autograft originating higher amount of NBV/TV and NBV+PV/TV than xenograft and higher NBV/TV than nHA. No significant differences were found between xenograft and nHA for both variables.

**Conclusion:** In this animal model nHA had similar regenerative behavior than xenograft. Autograft confirmed the higher regenerative behavior when compared to the other two biomaterials.

Topic: Basic Research: Biomaterials and Surfaces

P0965

**In vitro evaluation of a Multispecies-Oral-Biofilm on different Implant Surfaces**

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**Aim:** The purpose of this study was to evaluate the composition and viability of a 4-ssp oral Biofilm developed over four different implant surfaces.

**Material and Methods:** Biofilms were developed in layers on titanium disks by adding sequentially every 48-24 h an inoculum of 10<sup>6</sup> cells/150 microL of oral bacteria in the following order: Actinomyces naeslundii (ATCC 12104), Veillonella parvula (ATCC 10790), Streptococcus gordonii (ATCC 10558) and Fusobacterium nucleatum ssp. polymorphum (ATCC 10953). Bacteria were grown at 37°C and anaerobic conditions on four different implant surfaces. Ten sterile pre-fabricated disk-shaped test specimens were used for each surface of analysis: Titanium purity grade 2 and 4 with thermochemical treatment surface with avantblast or non-modified polished surface. Experiment was repeated three times and disks without bacterial inoculum were used as negative controls. Biofilm viability was assayed with 1% TTC test and biofilm composition by checkerboard (DNA-DNA hybridization)

**Results:** Total bacterial load was significantly greater in Ti4 surfaces than in Ti2, depending on the surface treatment. Thermochemical treatment surface with avantblast showed to attach significantly more bacterial cells than the polished one. Analysis of proportions revealed the same pattern of biofilm composition, being V. parvula the most prevalent bacterium, followed by S. gordonii, F. nucleatum ssp polymorphum, and A.naeslundii

**Conclusion:** In this study, an in vitro biofilm model simulating the kinetics and composition related with initial development of periimplantitis in vivo was developed. Our results indicate that the increased roughness of thermochemical surfaces treated with avantblast and grade 4 titanium helps bacterial adherence.

Topic: Basic Research: Biomaterials and Surfaces

P0966

**Silver-based gum for sealing the emergence of abutment screw: microbiological study.**

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**Aim:** Following prosthetic rehabilitation of dental implants, emergence of abutment screw remains unsealed or plugged up with cotton pellets, gutta percha, Teflon or wax. These techniques do not permit the antibacterial sealing, thus exposing peri-implant tissues to potential infections. Silver is widely used in medical topical gels and impregnated into bandage. Aim of this microbiological study was to test a new antibacterial silver-based gum (Silver-Seal) for sealing the emergence of abutment screw.

**Material and Methods:** In this split-mouth randomized controlled

trial, twenty abutments, transfixing screw and crowns from ten patients were treated with ultrasounds for 2 minutes and disinfected with hypochlorite at 5% for 3 minutes. After re-screwing abutments on implants, in ten randomly selected sites cotton pellets were plugged up in the emergence of the abutment screw (control group), remaining sites were sealed with Silver-Seal (test group). All sites were covered with composite. After 2 weeks cottons and silver-seals were harvested and microbiologically analyzed.

**Results:** At the evaluation, average of aerobic and anaerobic bacteria was respectively  $2.51E+03$  colony-forming unit (CFU) and  $6.13E+03$  CFU in control group,  $5.00E+01$  CFU and  $6.33E+02$  CFU in test group. No significant difference was found between groups on total amount of bacteria and on amount of aerobic and anaerobic bacteria (t-test for paired-samples  $p>0.05$ ).

**Conclusion:** Plugging up cotton pellets in the emergence of abutment screw allows the contamination of aerobic and anaerobic bacterial. Silver-seal considerably reduce the percentage of anaerobic bacteria, and reduce the total bacteria amount. However due to the small number of samples the difference is not statistically significant.

Topic: Basic science in implant dentistry

**P0967**

### Tissue reaction to various bovine and porcine-based, non-crosslinked collagen matrices: a systematic in vivo study in animals and humans

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**Aim:** The present study assessed the tissue reaction to six different bovine- and porcine-derived, bilayered or multilayered, non-crosslinked collagen I and III matrices in murine and human tissue. The focus was on their integration, vascularization and the pattern of the host's cellular inflammatory response. Silk fibroin as a naturally derived protein was used as a control.

**Material and Methods:** Using a previously described subcutaneous implantation model in CD-1 mice, the tissue integration and response to all groups were studied for up to 60 days (3, 10, 15 and 60 days). Human oral tissue samples were histologically obtained up to six months after successful soft tissue reconstruction with these matrices. All samples were analyzed histologically and histomorphometrically.

**Results:** The collagen-based matrices induced in both species predominantly mononuclear cells, i.e. lymphocytes, macrophages, but no multinucleated giant cells. All analyzed samples were well integrated in both species and detectable after two months in mice and even after six months within human tissue. They showed a mild vascularization. Silk fibroin induced additional multinucleated giant cells and underwent a high vascularization and fast biodegradation when compared to the collagen matrices.

**Conclusion:** The results of the present in vivo studies in both mice and humans revealed that all analyzed collagen matrices undergo a clinically desirable tissue integration with no foreign body giant cells and mild vascularization. The tissue response to silk fibroin suggests that a high vascularization of the implantation bed might be associated with a certain level of inflammation, especially with multinucleated giant cells.

Topic: Basic science in implant dentistry

**P0968**

### The correlation between the width of the lateral sinus wall and complications during open sinus lift procedure. A retrospective analysis.

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**Aim:** Introduction: Before sinus lift procedures, patients are referred for a CT scan. Usually clinicians measure the height of the available bone, but no measurement regarding the lateral walls is made (although it is drilled). Perforation of the Schneiderian membrane is the main intraoperative complication, (7%-35% of all procedures). **Aim:** To evaluate the correlation between sinus wall anatomy and complications during open sinus lift procedures.

**Material and Methods:** Computer aided measuring was performed using the CT scans of 25 patients in order to evaluate the width of both the lateral wall and the Schneiderian membrane. Data regarding the complications was collected from patients' charts.

**Results:** Out of 25 cases that were included in the study, perforations of the Schneiderian membrane had occurred in 4 cases. There was no statistical difference between the perforated group and the non-perforated group in regard to the width of the lateral wall or the width of the membrane. No correlation was found between the width of the lateral wall and membrane thickness. There was a statistical difference between the perforated group and the non-perforated group regarding the existence of a septum ( $p=0.039$ ), all cases with perforations had a septum.

**Conclusion:** No association was found between the width of the lateral wall and perforations of the Schneiderian membrane. The existence of a septum in the sinus was in correlation to membrane perforation. Further study with larger groups should be conducted.

Topic: Basic science in implant dentistry

**P0969**

### Alveolar Bone Remodeling Around Immediate Implants Placed in Accordance With the Extraction Socket Classification - A Three-Dimensional Micro-Computed Tomography Analysis.

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**Aim:** The aim of this micro-computed tomographic investigation was to analyze the alveolar bone remodeling around immediate implants placed in accordance with the extraction socket classification (ESC).

**Material and Methods:** Under general anesthesia, ten beagle dogs underwent atraumatic tooth extractions according to the ESC. Animals were randomly divided into three groups (ESC-1: single tooth extraction, b) ESC-2: two contiguous teeth extraction, and c) ESC-3: more than two contiguous

teeth extraction) with 16-sites per group. Immediate implants were inserted in each class and postoperative plaque control measures were undertaken. After euthanasia, the jaw segments were evaluated for bone thickness, marginal bone loss (MBL) and bone-to-implant contact (BIC) using micro-computed tomography.

**Results:** The mean buccal bone thickness ( $P<0.05$ ) and MBL ( $P<0.05$ ) was compromised in jaws in ESC-3 as compared to those in ESC-1 and ESC-2. The BIC was significantly higher among jaws in ESC-1 as compared to those in ESC-2 and ESC-3 ( $P<0.05$ ). There was no significant difference in the buccal bone thickness, MBL and BIC among the groups in the maxilla and mandible. Lingual bone remodeling did not reveal any significant differences among the groups in both jaws.

**Conclusion:** Buccal bone remodeling is significantly more extensive around immediate implants placed in multiple contiguous tooth extraction sites as compared to immediate implants placed in single tooth extraction sites.

Topic: Basic science in implant dentistry

**P0970**

### Mechanical and physical comparison of three knots configuration using four suture materials : an in Vitro study.

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**Aim:** The aim of the present study is to evaluate and compare the mechanical properties of three knots configurations on four suture materials when exposed to physical conditions.

**Material and Methods:** Four 5-0 (Silk, Polyamide 6/66, Polyglycolic acid, Glicolide-E-Caprolactone) gauges suture materials have been used in this study. Monofilament (Polyamide 6/66, Glicolide-E-Caprolactone), multifilament (Silk, Polyglycolic acid). 20 samples of each/group. Suture materials went through mechanical and physical (thermal cycle) evaluation. Three knots configuration were compared A. 2=1=1 (forward=forward=reverse), B. 2=1=1 (forward=reverse=forward) and C. 1=2=1 (forward=forward=reverse) Mechanical properties (tensile strength, elongation, knot slippage/breakage) were measured using a Universal Testing Machine. Samples were previously knotted at a round metal 26mm diameter cylinder before testing all parameters. Thermal cycle process; sutures were introduced into two water tanks during 1 minute/tank at 5 and 55 centigrades of temperature respectively to simulate oral conditions (1 and 2 weeks clinically) and lately check suture degradation. Control groups were compared to thermal cycle groups on three knot configurations at 7 and 14 days.

**Results:** Elongation seems to be directly dependent on the suture material. Glicolide-E-Caprolactone shows the highest results and silk the lowest ( $P<0.001$ ). Resistance decrease with sutures exposure to thermal cycle ( $P<0.001$ ). Knot configuration B shows the better results for knot security with 30% of slippage. (Significance level  $pP<0.05$ )

**Conclusion:** Physical conditions have shown to influence in the mechanical properties of suture materials. This pilot study results will lead to future research. A thorough understanding of the physical and mechanical properties is essential to the choice of suture materials.

Topic: Basic science in implant dentistry

**P0971**

### Effect of calcium phosphate implant surface coatings in osteoporotic animal models: A meta-analytic approach to the literature

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**Aim:** The aim of the current systematic review was to investigate the effect of calcium phosphate coatings on dental implants as regards osseointegration in osteoporotic animal models.

**Material and Methods:** The current literature was systematically evaluated. A PubMed search was conducted using specific inclusion and exclusion criteria to select relevant animal studies. As primary outcome variable bone-to-implant contact (BIC) percentage and as secondary outcome variable mechanical stability data were extracted and meta-analyzed.

**Results:** Finally, 14 out of 2704 publications were included for analysis. Mean BIC for CaP-coated implants in osteoporotic animals was found to be 82.7% (95%CI: 74.4% to 91.0%), whereas the mean BIC for non-coated implants in osteoporotic animals was 63.7% (95%CI: 50.7% to 76.7%). The means are statistically significant different ( $p<0.05$ ) from each other. On the subject of mechanical testing, push-out test showed for CaP-coated implants in osteoporotic animals a mean of 162.8 N (95%CI: 144.5 N to 181.1 N) and for non-coated implants 57.4 N (95%CI: 44.7 N to 70.1 N). The mean difference was statistically significant ( $p<0.05$ ). Moreover, torque-out testing revealed for CaP-coated implants in osteoporotic animals a mean of 192.3 Ncm (95%CI: 168.8 Ncm to 215.8 Ncm) and for non-coated implants 73.9 Ncm (95%CI: 54.7 Ncm to 93.1 Ncm). The mean difference was statistically significant ( $p<0.05$ ).

**Conclusion:** Within the limits of this meta-analytical approach towards the literature we conclude that calcium phosphate coatings may have the potential to compensate for a possible negative impact of osteoporosis with regard to bone-to-implant contact percentage and/or implant stability of oral implants.

Topic: Basic science in implant dentistry

**P0972**

### White&Pink esthetics on implant supported FPD's using titan abutments - A Different Approach

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**Aim:** Introduction There were many articles and books written in the last years regarding esthetics in dentistry. We all agree that things like dental morphology and function, hue, shade and value should be discussed when speaking about the esthetic tooth replacement using all ceramic crowns, for example (white esthetics). When speaking about gingiva (pink esthetics), most of us think about the risks and morbidity that may occur after surgical procedures as new papilla forming or connective tissue grafts.

**Material and Methods:** Case report: This article presents two cases, both restored with implant supported FPD's using

titanium abutments. For the white aesthetic we used IPS e.max Press (Ivoclar Vivadent) all-ceramic crowns. We also pressed separately ceramic on the abutments using the same ceramic mass (IPS e.max Ceram), according to patient's aesthetic and functional needs. For the pink aesthetic area we used screw-retained provisionals, which allowed us to nicely reshape the gingiva between two adjacent implants in order to obtain the new papilla and the emergence profile for the final restorations. The final restorations are individual crowns, cemented adhesively.

**Results:** Discussion : This method applies only according to gingival thickness, which should be at least 3–4mm. In thinner gingiva cases, a soft tissue graft both with the implant surgical placement should be considered.

**Conclusion:** : If the gingiva is thick enough, we have a fast, easy and predictable way of getting white and pink aesthetic.

Topic: Basic science in implant dentistry

## P0973

### Accuracy of CBCT for linear measurements in the mandible

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**Aim:** To compare the accuracy of small vs. large measurements, and measurements in anterior vs. posterior areas of the mandible, performed on CBCT images.

**Material and Methods:** Seven porcine mandibles were utilized. Six cross-sectional planes were defined in each mandible (3 in the anterior and 3 in the posterior areas) by Gutta Percha filled drillings. Mandibles were scanned in a CBCT apparatus, and sectioned in the marked planes. Direct measurements (DIR) were recorded followed by respective radiographic measurements (RAD) on CBCT images. Differences between RAD and DIR measurements ( $\Delta$ RAD-DIR) were calculated and compared between small vs. large and between anterior and posterior measurements.

**Results:** A total of 162 sites were included. A statistically significant difference was found in  $\Delta$ RAD-DIR between small and large measurements ( $-0.22 \pm 0.42$ mm and  $-0.11 \pm 0.62$ mm, respectively,  $p=0.01$ ). Differences between anterior and posterior measurements were not statistically significant ( $-0.26 \pm 0.47$ mm and  $-0.12 \pm 0.55$ mm, respectively,  $p=0.284$ ). A mean underestimation of RAD was found in small and large measurements as well as in anterior and posterior measurements. However, 13.8% of the large measurements and were greater than 0.5 mm (CI: 6.2, 21.3) and 3.8% were greater than 1 mm (CI:  $-0.4$ , 0.79).

**Conclusion:** Accuracy is not significantly affected by jaw area. A statistically significant difference occurs between small and large measurements.

Topic: Basic science in implant dentistry

## P0975

### Marginal bone and soft tissue behavior following platform switching abutment connection/disconnection: a dog model study

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**Aim:** To evaluate radiographically, histologically and clinically the hard and soft tissue stability following abutment connection/disconnection in Bone Level® implant and prosthesis placement.

**Material and Methods:** Pre-molar extractions were made in 6 beagle dogs and sites healed for 3 months. 4 BL® implants were placed (2 in each side of the mandible – Pm3 and Pm4) and multi-base abutments were screwed on test side and healing abutments on control side. At 6, 8, 10, 12 and 14 weeks of implant placement, clinical parameters (gingival index, plaque index, recession, suppuration, keratinized gingiva, mobility) were registered. Multi-base abutments on test side were never unscrewed from metal prosthesis try-in until final prosthesis delivery, while on control side, healing abutments were always removed (5 times). Final clinical and radiographic control were done 6 months after implant placement and animals sacrifice 3 months after (9 months after implant placement)

**Results:** Histomorphometric analysis did not show any statistically significant difference between both groups in terms of soft tissue dimensions or bone level changes. Moreover, no statistically significant differences were observed in any clinical parameter. No differences were found on radiographic analysis.

**Conclusion:** The connection/disconnection of platform switching implant abutment (mechanical disruption) does not seem to conduct to the reestablishment of the biological width in a more apical position.

Topic: Pre clinical models: implant therapy

## P0976

### Treatment of periodontal and peri implant defects using various injectable composite hydrogel/biphasic calcium phosphate biomaterials in two pre clinical models in beagle dogs.

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**Aim:** To evaluate two new injectable composite hydrogel/biphasic calcium phosphate in periodontal and peri implant surgically created defects.

**Material and Methods:** An injectable composite silanized hydroxypropyl methyl cellulose/biphasic calcium phosphate (Si-HPMC/BCP) has been investigated for treating 16 furcation defects created in dog maxillary premolars. In a second part, two composite biomaterials (Si-HPMC/BCP and HPMC/BCP), were evaluated in 24 peri implant defects. Dogs were sacrificed



after three months, and a non-decalcified preparation was made. Microscanner reconstruction and scanning electron microscopy (SEM) observations were performed. The three dimensional behavior of the biomaterials and new bone formation were evaluated. Moreover slices of 100 µm or 7 µm section were examined by light microscope, after Goldner's staining. A qualitative and quantitative evaluation (histology, histomorphometry, SEM analysis) were performed.

**Results:** After 3 months, the new bone formation around BCP particles in furcation and peri implant defects was more discernible when compared to healing in control. BCP particles sustain the bone healing process by osteoconduction, while the hydrogel enhances intergranular cohesion and acts as an exclusion barrier on the external part of the defects.

**Conclusion:** These hydrogel/BCP biomaterials promote new bone formation, in dog's critical size furcation and peri implant defects. In these unfavorable defects, the viscosity and texture of the injectable composite material seems to help the retention of the BCP granules in the defect during the healing phase.

Topic: Pre clinical models: implant therapy

**P0977**

### The effect of photodynamic therapy on intraorally formed biofilm on titanium surface.

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Gangneung/Korea

**Aim:** The purpose of this study was to assess the efficacy of photodynamic therapy (PDT) using erythrosine and halogen light source, to the biofilm formed on machined surface titanium disk in vivo.

**Material and Methods:** Eleven volunteers carried an acrylic appliance containing the six machined surface titanium disks ( $Ra=0.365\mu m$ ) on the upper jaw over a period of 5 days. After the 5 days biofilm formation period, disks were removed. Photodynamic therapy using 20µM erythrosine and halogen light was applied to biofilms formed on the disks. (negative control group, E0 group; erythrosine 60s, E30 group; erythrosine 60s + halogen light 30s, E60 group; erythrosine 60s + halogen light 60s) After the PDT, bacterial suspensions were made from biofilms on each disks. Each suspensions were diluted and cultivated on blood-agar plate for 5 days in anaerobic condition.

**Results:** Count of cultivated bacteria in E60 group was significantly less than control group and E0 group. In experimental groups, light exposure time and bacterial counts showed negative correlation.

**Conclusion:** Photodynamic therapy using erythrosine and halogen light showed bacteriocidal effect on biofilm formed on titanium disk in vivo. Especially, applying 20µM erythrosine 60 seconds and halogen light 60 seconds showed significant effect. Additional study is necessary to assess the efficacy of this PDT protocol in clinical dentistry.

Topic: Pre clinical models: implant therapy

**P0978**

### Accuracy of a Novel Stereolithographic Guide for Computer-Aided Implant Placement: An In Vitro Study

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**Aim:** StendCad Beyond guide system developed to overcome the disadvantages of conventional surgical guide systems. Its design stabilizes the position of the Contra Angle. It provides effective cooling of the surgical zone, tubeless application discard the possibility of contamination of the osteotomy side and only one surgical guide is sufficient to achieve placement of implants with different diameters. The aim of this study is the optimization of the developed surgical guide and to measure its accuracy.

**Material and Methods:** Edentulous, Kennedy Class 1, multiple single tooth missing maxilla and mandibula models duplicated with %10 barium sulphate. CBCT scans taken from models, and implants planned on software (StentCad, Italy). Stereolithographic surgical guides fabricated and implant sockets prepared on the models. These osteotomy models were scanned with 3D scanner (Smartoptics activity 880). Implant positions and angulations were evaluated on software to compare deviations from the planned positions (VR Mesh Studio).

**Results:** Main angular deviation; main apical deviation; main coronal deviation; main vertical deviation in the apex  $1.04^\circ$ , 0,23mm, 0,17mm, 0,019 mm measured respectively.

**Conclusion:** Within the limits of this study implant planning can be transferred to the surgical side successfully. Further studies are needed to establish the advantages of this novel surgical guide.

Topic: Pre clinical models: implant therapy

**P0979**

### Analysis of RFA in titanium implants with shotblasted surface

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**Aim:** To evaluate the Implant Stability measured with the Resonance Frequency Analysis (RFA) between two groups of implants: Control: Implants with sand blasted acid etched surface Test: Implants with shot-blasted surface

**Material and Methods:** This study was carried out on the tibia of six New Zealand rabbits (4Kg). Two implants were placed in each tibia, one implant control and one test spaced 20 mm. 2 scoops of RFA was determined by Ostell ISQ at the time of implantation and after 6 weeks. At 6 weeks the rabbits were sacrificed. The statistical analysis was performed using SPSS statistic program. Descriptive statistics and inferential test were performed (T-student)

**Results:** At the time of implant placement, the RFA control group was  $70.4 \pm 5.52$ , the test group was  $74.83 \pm 4.96$ , no statistical differences between groups were observed. At the time of sacrifice (42 days) the RFA group was  $74.1 \pm 7.85$  in the control and  $77.16 \pm 4.9$  in the test group, no statistical differences were observed.

**Conclusion:** The stability gained with shot-blasted surface is similar to implants with SLA surface in the rabbits tibia without significative differences.

Topic: Pre clinical models: implant therapy

## P0980

### The impact of colitis on early osseointegration: an investigation in the rat tibia implant model

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**Aim:** Crohn's disease is a chronic inflammatory process that has recently been associated with a higher risk of early implant failure. This is the first preclinical trial to investigate the impact of two chemically-induced colitis models on the early phase of osseointegration in a rat tibia implant model.

**Material and Methods:** Thirty male Wistar rats were randomly divided into three groups. No colitis induction (n=10); Colitis was induced by feeding rats dextran-sodium-sulfate (DSS) in drinking water (n=10); furthermore induction was performed by intrarectal instillation of 2,4,6-trinitro-benzene-sulfonic-acid (TNBS) (n=10). One week after disease induction, titanium miniscrews were inserted into the tibia. Four weeks after implantation, peri-implant bone volume per tissue volume (BV/TV) and bone-to-implant contacts (BIC) were determined by histomorphometric analysis.

**Results:** Cortical histomorphometric parameters were similar in the control, DSS and TNBS groups. Cortical BV/TV was  $92.2 \pm 3.7\%$ ,  $92.0 \pm 3.0\%$  and  $92.6 \pm 2.7\%$ . Cortical BIC was  $81.3 \pm 8.8\%$ ,  $83.2 \pm 8.4\%$  and  $84.0 \pm 7.0\%$ , respectively. No significant differences were observed when comparing the medullary BV/TV and BIC ( $19.5 \pm 6.4\%$ ,  $16.2 \pm 5.6\%$  and  $15.4 \pm 9.0\%$ ) and ( $48.8 \pm 12.9\%$ ,  $49.2 \pm 6.2\%$  and  $41.9 \pm 11.7\%$ ), respectively. Successful induction of colitis was confirmed by loss of body weight and colon morphology.

**Conclusion:** The results show that osseointegration in the rat tibia is not impaired in these two chemically induced colitis models. These findings can be considered a basis for further studies aiming to understand the cause of early implant failures in patients with Crohn's disease.

Topic: Pre clinical models: implant therapy

## P0982

### Healing pattern around titanium implants, after guided bone regeneration with bioresorbable membrane . A histomorphological study.

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**Aim:** The aim of the present study was to evaluate the healing pattern after guided bone regeneration, using an autogenous bone graft covered with a collagen membrane.

**Material and Methods:** 30 Wistar rats received an onlay autogenous bone graft, harvested from parietal bone, laid on the external area near the angle of the mandible with titanium fixtures. The grafts

were covered with a collagen membrane and the animals were sacrificed at 0 hour, 14, 21, 45 and 150 days. Decalcified sections were prepared according to the fracture technique.

**Results:** After two weeks, the bed-graft interface presented an immature connective tissue layer, containing fibroblasts-like cells and vessels. After 21 days, under the membrane, newly formed trabecular bone established bridges connecting the bed and the lateral borders of the graft. The receptor bed showed intense remodeling and adjacent to the implant threads, immature bone and vessels could be seen. After 45 days, the collagen structure of the membrane presented extensive resorption and a large decrease in thickness. After 150 days, a complete fusion of the graft with the receptor bed and an advanced level of bone maturity of the graft were observed.

**Conclusion:** The final period of biodegradation of the collagen membrane occurred at 45 days and an initial bone maturity could be observed. Only at 150 days, we could assure the graft integration to the newly formed bone at bed receptor area, with additional bone tissue gain, demonstrating the predictability of this animal experimental model, and the importance of this pre clinical study.

Topic: Pre clinical models: implant therapy

## P0983

### Iatrogenic Dental Implants. Importance of diagnosis and treatment. A few curious cases.

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**Aim:** Therapy with dental implants are very common by these days. Success rates of dental implants vary, depending on where in the jaw the implants are placed but it is always important to make a good diagnose and planification of the case. We present a few curious cases of iatrogenic dental implants.

**Material and Methods:** We present three curious cases of iatrogenic dental implants. Case 1. Dental implant into the sinus floor Case 2. Dental implants affecting the inferior alveolar nerve Case 3. Dental implants outside the alveolar bone

**Results:** We show repercussion of the absense of planification

**Conclusion:** Implant therapy requires strict planning and execution to prevent failure and complications.

Topic: Pre clinical models: implant therapy

## P0984

### Heat Production and Instrument Wear During Osteotomy Preparation for Dental Implants with Compressive Osteotomes

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**Aim:** To assess the instrument wear and heat production using osteotomes under conditions simulating implant placement in D3,D4 bone.

**Material and Methods:** Dental osteotomes were tested (Winsix,Italy). Scanning electron microscopic (SEM) images of all the osteotomes prior to their use and after 5,10 and 20 osteotomies were obtained. Two impressions of all the instrument working tips were taken at baseline and after 5,10 and 20 series. Epoxy resin casts of th tips were obtained. Implant preparations were performed on porcine ribs through a compressive preparation. Temperatures generated at different depths (2,5,9mm) were measured at each serie using 3 thermocouples connected to a digital thermometer. The ribs were partially immersed in a custom-made water bath /water pump system that maintained the baseline temperature at 36.0 C. After 5,10 and 20 series of osteotomies the manual instruments were cleaned with alcohol and sterilized. Following the sterilization cycle impressions of all the tips were made and SEM evaluation of the casts were performed again.

**Results:** Statistical evaluation of the temperature generated during the implant site preparation showed no significant variation between the baseline values and those of the site preparations. SEM analysis did not show any evident alteration of the osteotomes.

**Conclusion:** Within the limits of this study the production of heat during implant preparation using osteotomes do not rise over the values that negatively affect bone and may jeopardize osseointegration. The mean temperatures values are homogenous and significantly lower than those reported during preparation with standard implant drills. At the SEM evaluation no evident alterations were detected.

Topic: Pre clinical models: implant therapy

## P0985

### Influence of hyperbaric oxygen therapy on peri-implant bone healing in rats with alloxan-induced diabetes

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**Aim:** The influence of Hyperbaric Oxygen Therapy (HBOT) on peri-implant bone healing in rats with alloxan-induced diabetes was studied.

**Material and Methods:** Forty-eight male rats were randomly divided into six groups: 1) healthy rats (HR) that received no HBOT; 2) HR that underwent 10 sessions of HBOT before implant installation; 3) HR that underwent 10 sessions of HBOT after implant installation; 4) rats with induced diabetes (DR) without HBOT; 5) DR that underwent 10 sessions of HBOT before implant installation; 6) DR that underwent 10 sessions of HBOT after implant installation. A screw-shaped titanium implant was inserted into the femur. The animals were killed 28 days after implantation. The percentage of bone-to-implant contact (BIC) within the implant threads was evaluated.

**Results:** Lower BIC was observed in DR ( $35.35 \pm 18.04$ ) compared to the HR ( $69.07 \pm 09.01$ ) ( $p = 0.001$ ). However, with HBOT, either before or after implantation, BIC was increased in DR. HBOT before implantation was  $p = 0.03$ ; HBOT after implantation was  $p = 0.08$ . This increase reversed the negative effect of diabetes; therefore, the differences between DR and HR were not significant with HBOT ( $p \geq 0.21$ ).

**Conclusion:** HBOT, either before or after implantation, increased the BIC in DR to the level of HR.

Topic: Pre clinical models: implant therapy

## P0986

### Marginal bone and soft tissue behavior following platformswitchingabutmentconnection/disconnection – a dog model study

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**Aim:** To evaluate radiographically (bone level), histologically (biological width components) and clinically (soft tissue level changes) varying only the stability of abutment connection / disconnection during the standard Bone Level® implant and prosthesis placement.

**Material and Methods:** Materials/ Methods: Pre-molar extractions were made in 6 beagle dogs and sites healed for 3 months. 4 BL® implants were placed (2 in each side of the mandible – Pm3 and Pm4) and multi-base abutments were screwed on test side and healing caps on control side. At 6,8,10,12 and 14 weeks of implant placement, clinical parameters (gingival index, plaque index, recession, suppuration, queratinized gingiva, mobility) were registered. Multi-base abutments on test side were never unscrewed from metal prosthesis try-in until final prosthesis delivery while on control side, healing abutments were always removed (5 times). Final clinical and radiografic control were done 6 months after implant placement and animals sacrifice at 9 months after.

**Results:** Histomorphometric analysis on Pm3, showed that buccal distance from apical end of barrier epithelium to the first bone implant contact (aBE-BIC) was statistically significant ( $p = 0.046$ ) between test and control groups; on Pm4 the distance from the peri-implant margin to the first bone implant contact (PM-BIC) was also statistically significant ( $p = 0.046$ ). Only clinical parameter recession was statistically significantly higher ( $p < 0.001$ ) on test than on control group. No differences were found on radiographic analysis.

**Conclusion:** The connection/disconnection of platform switching implant abutment (mechanical disruption) does not seem to conduct to the reestablishment of the biological width in a more apical position.

Topic: Pre clinical models: implant therapy

## P0987

### Reliability of Ridge Mapping and Cone-beam Computed Tomography for the determination of edentulous ridge dimension in dental implant therapy

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**Aim:** The purpose was to compare the exactitude of alveolar ridge measurements obtain with ridge mapping (RM) technique against that of cone beam CT (CBCT) images.

**Material and Methods:** Twenty partially edentulous patients were recruited for implant placement. For all the measurements a vacuum-formed stent was fabricated for each subject. A buccal and lingual point was made in the stent to provide a reference of measurement for each implant site. Ridge mapping measurements with the stent were obtained before and after surgical flap reflection. Two calibrated observers made the CBCT images measurements. T test was used for the statistical analysis. Values less than 0.05 were considered statistically significant. Also, specificity and sensibility of CBCT and RM were compared. Intra-class correlation coefficient was measure between CBCT measurements.

**Results:** A total of 62 implants sites were evaluated. No statistical significant differences were obtained with CBCT and RM measurements ( $P=0,207$ ). In detecting proper buccal-lingual ridge the sensitivity and specificity were 59% and 91% for RM while CBCT obtained 92% of sensitivity and 94% of specificity. Concordance was found "good" (ICC 0.82).

**Conclusion:** Both methods provide reliable measurements. Although we found diagnostic limitations in the RM, it demonstrated to be a useful method for its exactitude, low cost, immediate result and no need of radiation. CBCT was recommended when deeper analysis is required.

Topic: Pre clinical models: implant therapy

## P0988

### Effect of soft tissue expansion on soft tissue microcirculation and healing after vertical ridge augmentation

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**Aim:** Wound dehiscence after ridge augmentation is mainly attributed to soft tissue deficiency and to disturbance of microcirculation caused by surgical trauma due to extensive tissue mobilisation. Soft tissue expansion prior to augmentation may improve soft tissue quality and may reduce the incidence of wound dehiscences. We investigated the effect of tissue expansion on soft tissue microcirculation and healing after vertical ridge augmentation.

**Material and Methods:** Bone defects were created on both mandibular sides in 10 beagle dogs by extraction of premolars and removal of bone. After 6 weeks of healing, self-filling osmotic tissue expanders (0.7 ml, Osmed, Germany) were implanted in randomly assigned test sites, contralateral control sites were left untreated. After 5 weeks of expansion, vertical augmentation was carried out in both test and control sites using cortical calvarial bone grafts. Soft tissue microcirculation was evaluated with Laser Doppler sonography (Periflux 5000, Perimed, Sweden) before augmentation, after local anaesthesia, after conclusion of augmentation surgery and again after 3 days. The incidence of wound dehiscences was evaluated after 2 weeks.

**Results:** Local anaesthesia and surgery caused significant reductions of perfusion in both test and control sites. 3 days after surgery, perfusion was still disturbed in control sites, while microcirculation in test sites was returning to pre-surgical levels. After 2 weeks, 2 wound dehiscences were found in test sites, compared to 8 dehiscences in control sites ( $p=0.02$ ).

**Conclusion:** Soft tissue expansion prior to vertical ridge

augmentation reduces the disturbance of microcirculation caused by augmentation surgery and reduces the incidence of wound dehiscences.

Topic: Clinical trials in implant dentistry

## P0989

### Immediate Loading with overdenture in edentulous mandible: long term result.

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**Aim:** To present a clinical result of immediate loaded dental implants supporting overdenture in edentulous mandible.

**Material and Methods:** 86 patients (49F,37M) with edentulous mandible o with small number of loosening teeth were consecutively enrolled in this study. A total of 344 Ankylos implants were placed (four implants in each mandible) and immediately loaded.127 implants were immediately inserted into fresh extraction sockets;54 were delayed implants.Implant length ranged from 9,5mm to 14mm.Following implant placement, the SynCone abutments were screwed on the implants. These abutments are manufactured with a precise fit to prefabricated secondary conical copings, that are polymerised into the denture base directly in the mouth of the patients. Panoramic radiographs at implants placement,6 months later and annually were taken; mSBI and mPII in different time intervals were recorded. Technical complications and patient satisfaction was evaluated.

**Results:** During the healing period four implants in four different patients were removed for mobility. One implant was removed after 5 years of loading for suppuration. After a total observation period of 49 months (range 30-84 months) all other implants presented healthy peri-implant soft tissue conditions (mSBI=1; mPII=1). Implant success rate was 98,5%. X-ray showed an excellent bone healing and stable crestal bone level.Two patients were not satisfied with aesthetic of rehabilitation; all other appreciated function, aesthetic and retention of the restoration.

**Conclusion:** Basing on the present long-term data it was concluded that four implants may support immediate loading in edentulous mandible.This protocol allows the reduction of treatment time and cost with considerable satisfaction for the patients.

Topic: Clinical trials in implant dentistry

## P0990

### Decontamination of the implant surface during the surgical treatment of peri-implantitis using a 0.12 or a 2% chlorhexidine solution: a randomized, double-blind, controlled clinical trial

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**Aim:** The primary objective of this controlled clinical study was



to evaluate the microbiological effect of decontamination of the implant surface during the surgical treatment of peri-implantitis using a 0.12 or 2% chlorhexidine solution.

**Material and Methods:** Adult patients (n=27) with at least one oral implant with clinical and radiographical signs of peri-implantitis (BoP+, PPD $\geq$ 5mm and peri-implant bone loss $\geq$ 2 mm) were consecutively included. Patients were randomly allocated to one of two treatment options and patients, surgeon and investigator were blind to group assignment. Implants with peri-implantitis lesions were surgically exposed, followed by mechanical cleansing using curettes and either 1 minute of chemical cleansing using 0.12% chlorhexidine + 0.05% cetylpyridinium chloride without alcohol (Perio-Aid®) (test group 1) or a 2% (alcohol-based) chlorhexidine solution (test-group 2). Microbiological samples were taken from the exposed implant surface before and after cleansing using sterile microbrushes. Total bacterial load and prevalence of seven periodontal pathogens were assessed. Statistical analysis was performed using Wilcoxon-signed-rank-test and Mann-Whitney-U-test.

**Results:** Test group 1 and test group 2 consisted of 12 and 15 patients respectively (39 and 31 implants). In both groups, cleansing of the implant surface resulted in a significant reduction of total bacterial load (p<0.001 for test group 1 and p=0.05 for test group 2). No differences were observed between both groups (p=0.37).

**Conclusion:** Decontamination of the implant surface during the surgical treatment of peri-implantitis using 2% chlorhexidine with alcohol does not seem to be more effective in reducing total bacterial load than using a 0.12% chlorhexidine solution without alcohol.

Topic: Clinical trials in implant dentistry

P0991

### Bone Level changes around tilted implants in Fixed Complete Denture and Fixed Partial Denture : a retrospective study.

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**Aim:** The aim of this retrospective study was to analyse the survival rate and bone level changes of tilted implants positioned between the maxillary sinuses and the mental foramina.

**Material and Methods:** 71 patients (39 Women and 32 Men) were included in the study. Two groups have been performed. 22 patients have been included in the test group (Tilted implants) and 49 patients have been included in the control group (Axial implants). ITI Straumann implant have been analysed. X Rays were taken after a follow up of at least 4 months. Bone level has been measured on the distal and the intercalary implant by the same calibrated operator.

**Results:** In the test group, 36 titled implants and 36 intercalary axial implants were

analysed, 60 were supported Fixed Complete Dentures (FCD's) and 12 were supported Fixed Partial Dentures (FPD's). 196 axial implants were included in the control group. The mean follow up duration was 16 months (range 4-64 months). In the test group one implant was lost and 7 in the control group. Concerning the success rate, logistic regression didn't show impact of gender, location, and titled or axial implants. In the test

group and control group, the mean bone loss were respectively 0,5mm/1,1mm for the distal implant and 0,5mm/0,6mm for the intercalary implant.

Multivariate analysis didn't show significant difference in bone loss between the 2 groups. No significant difference was found between maxilla/mandible and FCD's /FPD's.

**Conclusion:** Tilted implants may be considered as a viable option for the rehabilitation of edentulous patients.

Topic: Clinical trials in implant dentistry

P0992

### Immediate restoration of dental implants in patients with treated periodontal disease: 1 year results

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**Aim:** To evaluate implant and patient characteristics in a prospective clinical study involving immediate restoration of dental implants.

**Material and Methods:** Patients, diagnosed with generalized chronic periodontitis and previously treated, were accepted into the study when expressing their wish to receive immediate restoration of dental implants. Treatment planning and installation was computer assisted, using computerized tomography, planning software and a surgical template. Patients received abutments and cemented provisional prostheses 72 hours following implant surgery and were followed up after 10 days, 4 weeks, 3, 6 and 12 months.

**Results:** 18 patients were included, aged between 34-69 years (mean 54.5 $\pm$ 8.5 years). 5 patients were smokers, with 2.5-60 packyears. Fifty implants were installed, ranging between 1-8 implants per patient. Implant length was 10-13mm (median 13 mm) and diameter 3.75-5 mm (median 3.75mm). Mean insertion torque was 43 NCm  $\pm$  6.2 SD (range 30-50 NCm). Mean implant stability quotient (ISQ) was 71  $\pm$  11, range 37-85. One implant in a non smoking patient and 3 implants in another smoking patient failed for a total of 4 failed implants. Twelve month overall survival rate was 92%. Twelve month survival rate among non-smokers was 100%.

**Conclusion:** Survival of immediately restored dental implants in periodontally treated patients fall within the literature range.

Topic: Clinical trials in implant dentistry

P0993

### Essential Cone Implant: Succes and Survival. Multicenter Non-Interventional Study.

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**Aim:** Determine the survival rates of Essential Cone Klockner implants at 1 years of placement. Secondary objective: 1. Distribution of implants. 2. Changes in crestal bone level. 3. Evolution of the stability.

**Material and Methods:** Patients who require dental implant treatment were collected from 12 private dental clinics. Each practice placed in between 10 and 40 implants. Data was collected at the time of surgery (baseline), 2, 6 and 12 months and at the provision of the temporary restorations and at the fit of the permanent prostheses. The variables studied were implant location, length, diameter, length of the implant neck, distance from the implant neck to the crestal bone (standardized periapical X-ray), implant stability (Osstell ISQ system), surgical technique (ROG, maxillary sinus floor lifting, ...), time of loading and crestal bone loss.

**Results:** 193 implants were placed, only 2 implants failed (1.04%). 95 implants were placed in the molar region (49%). 92 implants in posterior maxilla (48%), 14 in anterior maxilla (7%), 81 in posterior mandible (42%), 6 in anterior mandible (3%). The mean baseline stability implants was 63.4 ISQ. 40% of the implants placed had a length of 10mm. 55% had a diameter of 4mm. 57% of the implants placed had a collar length of 1,5mm.

**Conclusion:** Essential Cone Implant showed excellent results at 1 year, very similar to other implant systems.

Topic: Clinical trials in implant dentistry

**P0994**

### Radiographic Analysis of Crestal Bone Levels Around Implants With One-Time Permanently Seated Abutments

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**Aim:** The primary goal of this prospective study was to evaluate the clinical efficiency of one-time permanently seated abutments with regard to changes in marginal bone levels. A secondary goal was to observe whether there would be any additional benefits of roughening the transgingival collar of the abutment on preventing the crestal bone loss.

**Material and Methods:** A total of 90 implants were placed at 22 patients which were randomly allocated into three groups. In the first group (30 implants) standard "machined collar" complete prosthetic abutment (CPA) were seated at the time of second stage surgery and remained in place through final restoration, while in the second group (30) modified "roughened collar" CPA seated permanently at the time of second stage surgery. The third group (30) served as control and standard "machined collar" CPA were seated after several placement and removals alongside a conventional restorative protocol. Standardized periapical radiographs were taken immediately prior to exposure of implants, just after delivery of the final restoration and at the following 1 and 6 months. Clinical perimplanter parameters were recorded at the same times.

**Results:** No significant differences were observed between "one-time permanently seated abutment groups" ( $0.39 \pm 0.07\text{mm}$ ;  $0.45 \pm 0.11\text{mm}$  respectively), while the relative pocket depths increased and the crestal bone levels decreased significantly in the 3th control group ( $1.05 \pm 0.26\text{mm}$ ).

**Conclusion:** Placing the CPAs during the 2nd stage surgery, prevents crestal bone resorption which is a by-product of repetitive replacing and removing of the abutments during conventional prosthetic rehabilitation.

Topic: Clinical trials in implant dentistry

**P0995**

### Sinus lift procedure using trans-alveolar approach with bone substitutes in the regeneration of lateral maxilla

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**Aim:** A pronounced resorption of the lateral maxilla is quite often clinical situation. Sinus grafting with lateral window approach is demanding and advanced surgical technique associated with many surgical risks. Healing time is longer and adequate quantity of the autologous bone and/or bone substitutes is necessary. Trans-alveolar, osteotome, technique is much simpler and efficient method for bone regeneration of the lateral maxilla. This method reduces surgical risk and shortens treatment time.

**Material and Methods:** 100 Astra Tech implants were placed in lateral maxilla with minimum bone height of 5 mm. Osteotome technique was performed using osteotome instruments and bone substitutes (Cerabone - bovine bone mineral, granulation size 1-2mm and Maxresorb - synthetic bone substitutes 60%HA / 40%B-TCP, 0.8-1.5mm; Botiss, Germany). CBCT analysis was performed immediately after surgery and 4 month later. ISQ measurements (Ostell) were performed.

**Results:** From 100 inserted implants, 4 implants was not integrated. This mean that integration rate is 96%. ISQ measurements show average value of 73.6, which mean that implants could be loaded after 4 months healing time period. CBCT volumetric analysis show 3-dimensional image of bone substitutes around implants and volumetric changes during the healing time.

**Conclusion:** Trans-alveolar sinus grafting using osteotome technique is simple and efficient method for bone regeneration of the lateral maxilla where residual bone height is at least 5 mm. This method reduces surgical risk, shortens treatment time and simplifies implant rehabilitation. This procedure made sinus augmentation more affordable for the patients from economical point of view.

Topic: Clinical trials in implant dentistry

**P0996**

### Rehabilitation of the severely atrophic maxilla combining Zygoma, with Short and/or Pterygoid Implants. Report of 20 consecutive cases.

F. Hernandez Alfaro, A. Valles Rodriguez, J. Lopez Vailagan, J. Mareque Bueno, V. Ruiz Magaz

Barcelona/Spain

**Aim:** To present our experience with 20 consecutive cases of severely atrophic maxillas, using zygoma implants in combination with short and/or pterygoid implants depending on the degree of atrophy based on the Cawood and Howell classification.

**Material and Methods:** 20 patients have been treated and prospectively evaluated. Cases were managed according to the degree of maxillary atrophy based on the Cawood and Howell classification, after evaluation and simulation with a CBCT. Zygoma implants were combined with short and/or pterygoid

implants to achieve optimal support for rehabilitations.

**Results:** A combination of Zygoma, pterygoid and anterior short implants was used to treat different atrophic scenarios: 50 zygoma implants, 12 pterygoid and 44 anterior short-implants were placed. All 20 cases were successfully loaded with four different protocols. 4 short anterior + 2 zygoma 2 short anterior + 2 zygoma + 2 pterygoid 2 short anterior + 4 zygoma 4 zygoma + 2 pterygoid

**Conclusion:** A combination of zygoma, pterygoid and short implants might be a good alternative to extensive bone grafting to manage the severely atrophic maxilla in selected cases. Important advantages of this treatment include the elimination of the morbidity of the donor site, the reduction of treatment time, the possibility of immediate loading as well as lower costs.

Topic: Clinical trials in implant dentistry

## P0997

### RANDOMISED CONTROLLED CLINICAL TRIAL COMPARING TRANSMUCOSAL AND SUBMERGED PLACEMENT OF STRAUMANN BONE LEVEL IMPLANTS.

J. Flores, C. Álvarez-Novoa, G. Barbieri Petrelli, C. Martín, M. Sanz

Madrid/Spain

**Aim:** To compare the radiographic bone loss around implants placed using either a submerged or a transmucosal technique and to evaluate the progression of periodontal parameters and the aesthetic outcome after implant restoration.

**Material and Methods:** Patients with one non-molar tooth lost, being adjacent and antagonist natural teeth, were included in the study. Patients were randomly assigned to one treatment group either submerged or transmucosal implant placement. Straumann Bone Level implants were placed by two periodontist. Submerged implants were exposed 8 weeks after the first surgery. At all evaluations standardized periapical radiographs and intraoral photographs were taken and periodontal clinical variables recorded by a single examiner. The main outcome variable is the radiographic change in bone level, measured with a computer software after digitalization of the standardized x-rays. Bone level is measured in the mesial and distal aspect of each implant. Statistical analysis was performed.

**Results:** 30 patients completed the 3 years follow-up period. Any implant was lost. Mean bone level 3 years after implant placement was  $0,87 \pm 0,78$  mm for submerged group and  $0,59 \pm 0,75$  mm for transmucosal group with no statistical differences between them. No statistical differences were observed in periodontal parameter at the 3rd year evaluation.

**Conclusion:** No significant differences were found in the evaluated parameters between placing the implant with a submerged or a transmucosal technique.

Topic: Clinical trials in implant dentistry

## P0999

### Immediate implant placement into a fresh extraction socket with excessive gap distance.

T. Siebert, R. Jurkovic

Trnava/Slovak Republic

**Aim:** The purpose of this preliminary study is to verify clinically an excessively large horizontal and vertical gap distance of an implant placed into an immediate extraction socket without primary flap closure, a bone graft, or a barrier membrane. An immediate implant and the cover screw were placed into the mesial extraction socket of the first molar in lower jaw.

**Material and Methods:** For this study been chosen 27 patients (15 female and 12 male) with partially edentulous mandibles. After the extractions of the first molars, 54 implants of 3.7 mm width and 12 mm length with „BIO surface“ (Impladent, LASAK, Czech Rep.) were immediately installed into the mesial socket of first mandible molar. Horizontally, the created gap between implant and bone was greater than 3 mm. All patient during the treatment received systemic antibiotic therapy – amoxicillinum + acidum clavulanicum 2x1 g orally for 6 days, to begin 1 day before surgery. Implants were functionally loaded with the final fixed screw retained bridge after 3 months. Radiographic evaluation of marginal bone level change was performed in 1 year.

**Results:** No implant failures were recorded to date. There was reestablishment of the implant biologic width coronal to the bone contact with connective tissue and junctional epithelium. Crestal bone loss around the immediately loaded implants was similar to that reported for standard delayed loading protocols.

**Conclusion:** This study suggests that the immediate placement of implants into extraction sockets with an extensive gap allows healing without primary flap closure, a bone graft, or a barrier membrane.

Topic: Grafting/augmentation procedures in implant dentistry

## P1000

### Implants survival rate in microvascular transplants

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<sup>1</sup>Klagenfurt/Austria, <sup>2</sup>Salzburg/Austria

**Aim:** For the reconstruction the microvascular transplants represent an important aspect to social, working and aesthetic functions for patients after a tumour or trauma. This study compares three different microvascular transplants

**Material and Methods:** Between 2001 and 2008 patients received a microvascular transplants from pelvis (7), Fibula (4) or Femur (7) and treated with implants. Out of 16 patients with 75 implants only one had an implant loss of 4%. We achieved a healing rate of 96%.

**Results:** Out of 16 patients with 75 implants only one had an implant loss of 4%. We achieved a healing rate of 96%.

**Conclusion:** Microvascular transplants can be used successfully to reconstruct the alveolar ridge. The transplant can be adjusted individually in order to carry out an implant with a strong supply

Topic: Grafting/augmentation procedures in implant dentistry

## P1001

### Implant therapy of edentulous sites originating from advanced horizonto-vertical periodontal defects after tooth extraction

B. Torok, B. Molnar, I. Gera, P. Windisch

Budapest/Hungary

**Aim:** Primary objective was to create sufficient periimplant hard and soft tissue conditions by reconstructing alveolar defects, originating from severe periodontitis. Secondary objective was to investigate the efficacy of the applied surgical protocol on the elimination of periodontal defects at adjacent teeth.

Three cases of chronic periodontitis patients with one maxillary front tooth with hopeless prognosis are presented. The objectives was to create sufficient amount of periimplant hard and soft tissue at sites where tooth or teeth had to be removed due to advanced periodontal breakdown. It was also tested if this surgical correction had any regenerative effect on the periodontal defects at the neighbouring remaining teeth resulting in the reduction of postoperative pocket depth and the no deeper the 3 mm residual pocket depth can be achieved.

**Material and Methods:** Twenty chronic periodontitis patients, with one tooth scheduled for extraction due to advanced attachment loss, with missing buccal bone were recruited. Patients underwent initial periodontal treatment, full mouth plaque- and bleeding scores were kept below 20% during the study. First stage surgery included tooth removal and extraction site development. After 6 months, at second stage surgery implants were placed with simultaneous ridge augmentation. After 9 months, abutment connection was performed. Probing pocket depth (PPD), gingival recession (GR), clinical attachment level (CAL) of adjacent teeth was recorded at baseline and abutment connection. Intraoperative measurements were performed to assess vertical and horizontal dimensions of the alveolar ridge during second- stage surgery and abutment connection. Intraoral radiographs with additional CBCT scans were recorded at baseline and before surgeries.

Three patients underwent a stepwise series of three consecutive surgical approaches to restore lost hard and soft tissues left after tooth extraction and to facilitate periodontal regeneration of the intrabony defects at the neighbouring teeth. Surgery one included tooth extraction, alveolar ridge preservation or extraction site development to regenerate alveolar ridge conditions. Surgery two served implant placement with simultaneous ridge augmentation. The periodontal defect and the edentulous ridge were overfilled vertically and horizontally with NBm (Bio-Oss®, particle size 0.25 to 1.0 mm, Geistlich AG, Wolhusen, Switzerland). Surgery three aimed at soft tissue augmentation with an appropriate-sized connective tissue graft.

**Results:** At abutment connection, vertical tissue gain at implants averaged  $2,5 \pm 1,17$  mm, horizontal tissue gain averaged  $1,58 \pm 1,16$  mm compared to second stage surgery. At abutment connection,

compared to baseline, PPD, GR and CAL changed at adjacent teeth from  $3,59 \pm 2,12$  mm to  $2,38 \pm 0,64$  mm;  $0,41 \pm 0,78$  mm to  $1,1 \pm 1,46$  mm;  $4 \pm 2,48$  mm to  $3,49 \pm 1,67$  mm; respectively.

Clinically and radiographically healthy periimplant conditions were achieved while the residual clinical probing pocket depth at the neighbouring teeth were no deeper than 3 mm and radiological bone fill could be detected in all cases.

**Conclusion:** This stepwise surgical approach resulted in favourable soft- and hard tissue conditions, periimplant hard tissues were levelled off to adjacent proximal crestal bone. Residual PPD values measured less than 3 mm on adjacent teeth.

This stepwise series of surgical techniques could be successfully applied for correcting severe ridge deficiencies and also can facilitate the comprehensive regenerative therapy of periodontal defects at adjacent teeth.

Topic: Grafting/augmentation procedures in implant dentistry

## P1002

### Histologic and histomorphometric analysis of socket preservation in dogs using Human Allograft in comparison with a bovine xenograft .

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**Aim:** The aim of this study was to compare the effect on early bone formation resulting from the placement of a xenograft and an allograft in a fresh extraction socket in dogs.

**Material and Methods:** Six mongrel dogs were used. The roots of the third and fourth mandibular premolars were removed. Allograft (Purosâ), xenograft (Bio-Ossâ) and socket left without grafting were used in randomly selected sockets. The dogs were euthanized at 4, 8 and 12 weeks the experimental sites were no demineralized sectioned . Tissue area percentage of bone (B), connective tissue (CT), and residual material (M), was calculated for each specimen.

**Results:** At 4 / 8 / 12 weeks the tissue of the extraction alone sites presented 33 / 32 / 32 % TC, 33/ 42/ 49% B, 34 / 25/ 20% Bone marrow. For Purosâ , 34/ 31/ 28% TC, 44/ 55/ 66% B, 22/ 14 / 11% M, For Bio-Ossâ 29/ 32/ 30% TC, 25/ 44/ 54% B 45/ 24/ 16% M. Differences for time were significant (P < 0.0001) for materials (P < 0.00001).

**Conclusion:** In the dog model, Allografts showed a significantly higher percentage of trabecular bone and total mineralized tissue compared to extraction alone and xenograft. With the time the quantity of residual material decrease with all the material.

Topic: Grafting/augmentation procedures in implant dentistry

## P1003

### Effect of perforation socket in the Healing process ,after tooth extraction : Dogs study

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**Aim:** Infectious process frequently results in extensive bone resorption and defect, periradicular or periapical lesions. Some time, the socket after extraction presented with a fistula on the buccal or lingual side. This study on the dog model is to see if this situation of fistula decrease the socket cicatrization.

**Material and Methods:** 8 mongrel dogs were used. The roots of the third or fourth mandibular premolars were removed. Defects were made at the middle of the socket through the buccal cortical plate. For 4 dogs the gingival tissue were also pierced, and for the others only bone. A part of Sockets were : left without grafting, filling with xenograft (Bio-Oss®), filling with allograft (Purosã), with or without implants. The dogs were euthanized at 4, 8 and 12 weeks, the experimental sites were no demineralized sectioned.

**Results:** In all the cases the defect of cortical plate is always present and not healed. Connective tissue penetrate into the socket through the defect and can go in contacts of the implant.

**Conclusion:** Sockets presented with a fistula thought the bone after extraction presents a defect of Healing. Connective tissue come inside the bone socket. The gingival tissue, filling with a material, or immediate implantation don't modify this tissue penetration.

Topic: Grafting/augmentation procedures in implant dentistry

**P1004**

### Trans-alveolar Sinus Floor Augmentation with a Dedicated Drills System: A Retrospective Study

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**Aim:** The aim of the study was to retrospectively evaluate the efficacy of the Cosci transalveolar sinus-floor augmentation technique in terms of implant survival rate and marginal bone loss.

**Material and Methods:** 76 implants from 57 patients that underwent sinus floor augmentation by the Cosci technique with simultaneous placement of implants by one surgeon (MG) were followed for a period of up to 72 months. The parameters evaluated were survival rate, the extent of sinus floor elevation and marginal bone levels. The examined variables were at patient level (Age, Gender, Periodontal status, Smoking Status, etc.) and at implant level (length, diameter, available bone before surgery, amount of sinus lift, etc.)

**Results:** Three implant systems and five different filling materials were evaluated. The implants' length ranged from 9.5 to 13 mm and the diameter from 3.7 to 5 mm. The initial bone level prior to surgery was 4 to 9 mm with an average of 6.5 mm. The average sinus floor elevation was 5.7 mm with a range of 4 to 9 mm. The average marginal bone loss for the study follow-up period was 0.521 mm with a mode of 0 mm (SD=0.98 mm). One implant was extracted prior to loading. The results were not influenced by the periodontal status, age or ASA of the patients.

**Conclusion:** Within the limits of this study, trans-alveolar sinus-floor augmentation with the Cosci dedicated drills system has a high success rate with minimal crestal bone loss.

Topic: Grafting/augmentation procedures in implant dentistry

**P1005**

### The Efficacy of Titanium Granules in Sinus Augmentation: A Histomorphometric and Micro CT Analysis on Human Bone Biopsies

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Ankara/Turkey

**Aim:** Several grafting materials have been used in sinus augmentation procedures for insufficient bone volume in the posterior maxilla. The aim of this randomized controlled study was to compare the use of porous titanium granules in addition to bovine bone mineral versus bovine bone mineral alone for bilateral maxillary sinus elevation procedures in the same patient via micro computed tomography (CT) and histomorphometric analysis.

**Material and Methods:** Eleven patients were included in the study and each patient was treated with bilateral sinus augmentation procedure using bovine bone and bovine bone (70%) + porous titanium (30%) granules. Residual bone height was 2-4 mm. After 6 months bone biopsies were retrieved from the implant sites for histomorphometric and micro CT analysis and bone volume and vital bone percentages were calculated. Immediate after core biopsy, 38 implants having standard dimensions were placed and implant stability (resonance frequency analysis) and mobility (damping capacity assessment) values were recorded.

**Results:** Histomorphometric analysis demonstrated newly formed bone with a well organized lamellar bone, and remaining particles were observed in contact with native bone in both groups. Bone formation in and around porous titanium granules were demonstrated by micro CT analysis. Average implant stability (75.1 versus 71.2 ISQ) were higher in titanium granules group where no differences were found between groups in terms of implant mobility values.

**Conclusion:** The present study showed that titanium granules may function as an augmentation material and may enhance the primary implant stability.

Topic: Grafting/augmentation procedures in implant dentistry

**P1006**

### Bone Regeneration In Dehiscence-Type Defects Following Implantation of Beta Tri-Calcium Phosphate With Hydroxyapatite Plus Biphasic Calcium Sulfate. An Experimental Study In Dogs

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Haifa/Israel

**Aim:** To confirm safety and efficacy of a combination of Biphasic-Calcium-Phosphate and Biphasic-calcium-sulfate(E) and compare to collagen membrane (PC) and to sham operation (NC).

**Material and Methods:** Two healthy mongrel dogs were used. Following flap elevation, maxillary and mandibular premolar teeth were extracted, 23 standardized buccal dehiscence defects (3X3mm) were surgically created on the buccal aspect each premolars site. Defects were randomly assigned to: E- n=20; PC- n=13; or NC- n=13. Surgery was timed to create observation periods of 6, 8, 10, 12 weeks. At 12 weeks dogs were sacrificed, jaws were processed for histomorphometry. Percent of newly formed bone (BD), Height in mm (H) and Area in mm<sup>2</sup> (A) of the newly formed bone, were recorded.

**Results:** At 12 weeks, Mandibular BD for E, PC, NC was 36.98%, 31.73%, 25.4% respectively. Maxillary BD was 42.5%, 44.24%, 37.32% respectively. Mandibular H for E, PC, NC was 1.65mm, 2.07mm, 0.29mm respectively. Maxillary H was 2.05mm, 0.96mm, 1.08mm respectively. Mandibular A for E, PC, NC was 4.73mm<sup>2</sup>, 7.12mm<sup>2</sup>, 0.76mm<sup>2</sup> respectively. Maxillary A was 4.84mm<sup>2</sup>, 1.56mm<sup>2</sup>, 2.05mm<sup>2</sup> respectively. BD in the E and PC groups was higher than in NC group. BD did not change significantly between the time points thus suggesting early bone regeneration. H and A in the E and PC groups were notably higher than the NC group. Overall a continuous increase of H and A was observed throughout the healing periods.

**Conclusion:** The results confirmed the efficacy and safety of BCP plus BCS for bone regeneration in dehiscence type extraction socket defect.

## Topic: Grafting/augmentation procedures in implant dentistry P1007

### The use of hydroxyapatite/agarose gel for sinus floor augmentation with simultaneous implant placement in the atrophic maxilla -A report of 28 cases

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**Aim:** Hydroxyapatite/agarose composite gel(HA/agarose gel) was degradable, hemostatic and injectable grafting material. The aim of this study was to assess the survival rate of simultaneous placements of dental implants during augmentation and stabilization by the use of hydroxyapatite formed on/in agarose gel in cases in which as little as 1 to 3 mm of residual bone.

**Material and Methods:** Twenty-eight consecutive patients (13 females and 15 males) aged between 25 and 65 years (mean, 54±9 years) were referred for implant-supported reconstruction of the posterior atrophic maxillae. Seventy-two implants (two to four per patient) were placed. Almost all case presented difficulty in achieving initial stabilization. There were no other clinically evident complications of the sinuses.

**Results:** The mean follow-up was 39 months (range, 23 to 72 months). Radiographs taken at the last follow-up demonstrated that the vertical augmented bone within the sinus ranged from 11 to 14 mm (mean, 12.3 mm). Sixty-eight implants were clinically osseointegrated, yielding a 95.6% success rate, whereas two implants were noted to be failed 4 years after restoration. At the second surgery, every implants were osseointegration. All patients received a fixed implant-supported prosthesis.

**Conclusion:** The HAP/agarose gel seems to possess potential as a grafting material for sinus floor augmentation with simultaneous implant placement.

## Topic: Grafting/augmentation procedures in implant dentistry P1008

### Patient morbidity after socket preservation using a connective tissue graft versus a bilayer collagen matrix: Preliminary results of a comparative Randomized Control Trial.

A. Fernandez Ayora, L. Geoffrey, E.H. Rompen, F. Lambert

Liege/Belgium

**Aim:** The present randomized controlled trial compared socket preservation procedures using bovine hydroxyapatite (Bio-Oss®, Geistlich, Switzerland) covered with a connective tissue graft (CT) versus a bilayer collagen membrane (CM) (Mucograft®, Geistlich, Switzerland), placed from buccal to palatal in split-thickness pouches in order to seal the extraction site and to potentially thicken the buccal mucosa. The aim of this present abstract was to evaluate post-operative complications and patient-centered outcomes of the two independent surgical protocols.

**Material and Methods:** This randomized controlled trial included 26 patients (16 female, 10 male) aged from 20 to 69 years (mean: 42.6, SD: 12). 26 teeth were extracted atraumatically and the 2 distinct surgical protocols were applied randomly. Patients filled out a VAS form 1 week after the surgery to evaluate their level of discomfort and post-operative pain. Drug intakes as well as complications were also recorded.

**Results:** Little differences between the 2 groups were found in terms of post-operative complications (bleeding) and pain at donor site. There was no statistically significant difference when the CT was used compared to the MC (p=0,41). The consumption of pain killers after the surgery decrease over the time (p

No statistical significant differences were found between the 2 groups in terms of post-operative complications (bleeding) and post-operative pain. The consumption of painkillers after the surgery decreased over time but was similar in the two groups.

**Conclusion:** According to the preliminary results of the present RCT, none of both protocols seemed to induce significant post-operative pain and discomfort. There was no difference between the two procedures regarding post-operative complications and patient centered outcomes.

## Topic: Grafting/augmentation procedures in implant dentistry P1009

### The Use of Free Fat Tissue Transfer to Improve Soft Tissue Thickness at Recipient Sites of Bone Augmentations.

F.K. Kablan

24990/Israel

**Aim:** Free fat tissue from the buccal fat pad (BFP) during the bone augmentation procedure is presented. It enhances immediate tension free soft tissue closure and improve long term soft tissue thickness and quality in the recipient site

**Material and Methods:** 20 patients 18 females, 2 males. Mean age 50 years. They underwent 3D bone augmentation. The fat free graft used to cover the augmentation site. Follow up was hold every two weeks and the healing process was uneventful. Reentry after 4 months, evaluation of the soft tissue thickness and nature, biopsy for Histological study and implants insertion. The follow up of the bone augmentations and implants that were inserted in these sites by periodic clinical evaluation and periapical radiographs

**Results:** The repair of the free fat is by scar tissue. In all our patients the fat tissue did not show any signs of necrosis, prevent wound dehiscence of bone augmentations, improve clinically the soft tissue thickness at the recipient sites and in histological studies it replaced by scar tissue. The final outcome is thick soft tissue at the recipient sites, and thereafter around the dental implants that inserted in these sites.

**Conclusion:** free graft of fat tissue from the buccal fat pad enhances immediate tension free closure of bone augmentations, prevents wound dehiscence, improves long term soft tissue thickness and mimic attached gingiva by its fibrosis healing.

Topic: Grafting/augmentation procedures in implant dentistry

## P1010

### Sinus Lift with Simultaneous 3D bone reconstruction using the lateral bone window: a novel technique

N. Nader, R. Younes, A. Berberi

Beirut/Lebanon

**Aim:** Edentulous posterior maxillas are subject to alveolar ridge resorption and increased pneumatization of the sinus. As a result, there is often a narrow ridge in the premolar region associated to a limited bone height under the sinus floor. This residual bone volume is mostly inadequate to receive and support implants. Sinus elevations are an accepted treatment modality to provide sufficient vital bone for the fixation of dental implants. When using the classical lateral window approach, the lateral aspect of the maxilla is exposed and then a window is prepared in the anterolateral sinus wall. The aim of this communication is to present a novel technique where we took advantage of the lateral bone window osteotomy and transposed it to the premolar region.

**Material and Methods:** The bone trap is used in a 3D bone reconstruction in association with mineralized bone allograft (Puros, Zimmer Dental) and covered by a pericardium collagen membrane (Copios, Zimmer Dental). 16 patients were treated using this technique. A radiographic control using Cone Beam CT were taken at 0, 3 & 20 weeks

**Results:** After a healing period of 5 months, the bone gain varied from 4 to 7 mm in width and was directly related to the architecture of the defect.

**Conclusion:** Therefore, using this technique, guided bone regenerative procedures (GBR) have evolved to be more predictable component of implant dentistry, either in preparation for, or in conjunction with, implant placement.

Topic: Clinical tips and cases: Grafting and augmentation

## P1011

### Palatal bone as alternative site for bone block harvesting.

A. Huk

Lviv/Ukraine

**Aim:** Introduction Postextraction alveolar ridge remodeling leads to developing of hard and soft tissue discrepancies which jeopardize proper 3D implant placement and impair aesthetic and functional result of implant based restoration. Utilising autologous bone blocks is known as a predictable treatment solution. This requires additional surgical site for harvesting when placing implants in the upper jaw. In attempts to find alternative donor site at the upper jaw, grafting potential of the palatal bone was found sufficient to manage small to medium size defects.

**Material and Methods:** Case report 11 patients with horizontal ridge and socket deficiencies were treated. Implant placement was performed simultaneously with bone augmentation. CBCT examinations were made for treatment planning and to define palatal bone volume and topography. Vestibular flaps were prepared with conventional approach. Horizontal palatal incisions were extended to the contralateral canine or premolar site. Full thickness palatal flaps were elevated. Cortical or cortico-cancellous bone blocks were harvested utilizing trephine burs or piezosurgery device. Blocks were used alone or partially grinded up and mixed with xenograft, all covered with collagen membrane. Flaps sutured with 5.0 and 6.0 suture.

**Results:** Discussion All surgical sites healed uneventfully. Palatal donor sites healed without significant pain and swelling. After the healing period of 3 months full block integration was observed in all cases with only minor remodeling.

**Conclusion:** When dealing with small to medium size horizontal ridge deficiency at the upper jaw palatal bone should be taken into consideration as a donor site for autologous bone block harvesting. However this procedure requires surgical skills and experience

Topic: Clinical tips and cases: Grafting and augmentation

## P1012

### Preservation of post-extraction socket by means of mineralized human allograft: clinical and radiographical evaluation after 4 months of healing.

P. Rizzo, M. Clementini, G. Furlani, C. Agrestini

Rome/Italy

**Aim:** Reduction of alveolar height and width after tooth extraction may present problems for implant placement, especially in the anterior maxilla where bone volume is important for biologic and esthetic reasons. Various grafting materials have been used for preservation of the dimensions of the residual alveolar ridge. The aim of this investigation was to assess the possibility of preserving the dimension of a postextraction socket from resorption using mineralized human allograft after tooth extraction.

**Material and Methods:** In 10 patients, 10 single extraction sites in the anterior area were grafted by means of mineralized human allograft. The osteoconductive material was covered by a collagen membrane in all cases. Intraoral radiographs were taken at baseline and after 4 months, showing a mean difference of bone level of  $-0.78 \pm 0.79$  mm. At 4 months, a reentry surgery was performed to place implant, and clinical measurements showed a mean reduction of  $1.2 \pm 0.9$  mm in width.

**Results:** It is critical to maintain the bone integrity, from tooth extraction to final implant restoration. Physiologically extraction socket healing is expected to decrease the ridge from 2 to 4 mm horizontally and 2 mm vertically. The changes observed in this study were much lower, and the alveolar ridges at the end were wide enough to accept normal diameter implants.

**Conclusion:** A favorable response was observed when a mineralized human allograft was applied to extraction sockets, suggesting that it may be useful for alveolar ridge preservation prior to dental implant placement.

Topic: Clinical tips and cases: Grafting and augmentation

P1014

### Maxillary alveolar ridge augmentation with cancellous block allograft and stereolithograph models. A case report.

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<sup>1</sup>Marbella/Spain, <sup>2</sup>Madrid/Spain

**Aim:** Introduction: Implant-supported rehabilitation of the edentulous ridge requires adequate bone volume. Loss of teeth leads to a pattern of bone reabsorption that can contribute to severe jaw atrophy and to an unfavourable maxilla-mandibular relationship. Recently, the use of block allografts for the treatment of alveolar ridge atrophy emerged to overcome donor site morbidity, yielding high implant survival rates.

**Material and Methods:** Case Report: An edentulous 52 year-old patient was referred. Clinical examination showed an atrophy of the jaws with an unfavourable maxilla-mandibular relationship. A stereolithograph model from the CT scan was performed to improve graft adaptation out of the mouth in aseptic conditions. Surgery was initiated with the regularization of the recipient site and the cancellous block allograft was adapted and attached. It was also used particulate bone and a pericardium membrane. After six months, 8 implants were placed in the maxilla, and 6 in the mandible. Four months later, the prosthesis were finished, with functional and aesthetics results.

**Results:** Discussion: Short-term block allograft survival rate was reported to be 93 % (Chausu et al. 2010). Keith et al. (2006) concluded that block allografts were more technique-sensitive, which necessitated meticulous surgical technique and follow up. Barone et al. (2009) reported that firm stabilization of the grafts is of prime importance, and the 2-stage approach results in better outcomes than one-stage surgery.

**Conclusion:** The advantages of using bone allografts include convenience for the surgeon, decreased operative trauma for the patient, an unlimited supply of reconstructive material, absence of donor site morbidity, and decreased operative time.

Topic: Clinical tips and cases: Grafting and augmentation

P1015

### A Gingival Cul-de-Sac Following a Free Gingival Graft to Increase Keratinized Tissue Prior to Implant Placement

R. Moëne, A. Mombelli, G. Garavaglia, T. Lombardi

Geneva/Switzerland

**Aim:** Introduction: Free gingival grafts are indicated to augment width as well as thickness of the gingiva where an implant would have little or no marginal keratinized tissue. This technique is very predictable if achieved prior to implant placement. However, even with a successful result, complications may occasionally occur. This poster presents a graft case where a gingival cul-de-sac developed on the facial mucosa of an implant ten months postoperatively.

**Material and Methods:** Case report: A 53-year-old woman presented with an absence of keratinized tissue in a mandibular premolar site where an implant had to be placed. A free gingival graft procedure was performed. The lack of gingiva was successfully corrected and an implant was placed. Ten months after the graft, the patient developed occasional swelling with an asymptomatic solid white discharge where the gingival augmentation procedure was done. Clinical examination revealed a 5-mm long gingival tract. Cytologic examination of the discharge revealed squamous cells and anucleated scales. Under local anaesthesia, the lesion was removed en bloc by an excisional biopsy.

**Results:** Healing was uneventful and no sign of recurrence was noted up to 5 months. Histological evaluation revealed the presence of a gingival cul-de-sac with invagination of the lining epithelium. The corium contained a mild chronic inflammatory infiltrate.

**Conclusion:** Discussion and Conclusion: Gingival grafts are predictable procedures. Complications are infrequent but possible. One of them is the development of a gingival cul-de-sac. Follow up is necessary to detect such events and to remove them in order to provide a definitive successful treatment.

Topic: Clinical tips and cases: Grafting and augmentation

P1016

### The stage of surgery : Free gingival graft around implant

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Gwang-Ju/Korea

**Aim:** Necessity of the keratinized gingiva around a natural tooth has been controversial for a long time. Such controversy continues also in peri-implant mucosa and necessity of the keratinized gingiva is not defined, same as that of a natural tooth. Indicating that different results have been drawn because factors affecting such studies are too variable, some authors mention that the keratinized gingiva around an implant is essential in terms of a clinical situation. Available application times of FGG to the patient with the lack of the keratinized gingiva are before implant 1st surgery, during implant 1st surgery and 2nd surgery, and after implant prosthesis. The aim of this study is to examine cases conducting FGG and follow up results.

**Material and Methods:** This study is composed of analysis of 4 cases of patients treated with dental implants. These patients operated



free gingival graft before Implant 1st surgery, during Implant 1st surgery, 2nd surgery, and after Implant prosthesis as four different times. follow up was followed after surgery, then the keratinized gingiva was evaluated, shrinkage of graft was measured.

**Results:** There was no evidence of side effects after free gingival graft. The keratinized gingiva maintained well after prosthetic treatment at all 4 case.

**Conclusion:** Although there are many controversial issues mentioned unnecessary of the keratinized gingiva around an implant, results of this case reveals necessity of the keratinized gingiva in both clinical and biologic view point.

Topic: Clinical tips and cases: Grafting and augmentation

## P1017

### Post-extraction sockets augmentation with collagen tissue matrix and allogenic bone substitute in the aesthetic area. A case series.

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Vilnius/Lithuania

**Aim:** To determine if the soft tissue augmentation with collagen tissue matrix of an initial anatomic situation after tooth extraction in esthetic area eliminates bone augmentation procedure during implant placement.

**Material and Methods:** Study included 6 patients (aged from 24 to 37 y) who needed to extract 6 central upper incisors. In all the cases the thin biotype (thickness less than 2 mm) of a gingiva with extremely thin buccal bone (thickness was 0-0.5 mm) was observed. Alveolar post extraction socket was augmented with allogenic bone substitute and 2 mm thickness xenogenic membrane. After four months of healing the computer tomography has been executed and evaluated. The width of bone was calculated to be from 5,5 to 7 mm. A minimally invasive flap was raised, all 6 placed implants were positioned in the correct 3D positions, healing abutments were connected the same day. All implants were restored with cement-retained metal ceramic restorations after 4-5 months after implantation.

**Results:** In all six clinical cases after 4 months after socket augmentation (despite previous extremely thin buccal bone) there was enough bone to place implants without any additional bone augmentation. All implants had excellent primary stability of 35N, therefore one stage surgery could be chosen.

**Conclusion:** Reduction of time and volume of the surgery conducted to less traumatic and cost effective procedure for a patient. Because of a good initial anatomic situation operation occurred without a need of a vertical incision that resulted in a better esthetics of the mucosal tissues.

Topic: Clinical tips and cases: Grafting and augmentation

## P1018

### Use of Cortical Lamina for Reconstruction of Alveolar Bony Defects; Case Report

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Cairo/Egypt

**Aim:** Alveolar bone defects represent a challenging problem for reconstruction; as it needs cortical cover, good adaptability and easy fixing technique. Although the Autogenous bone is the golden standard for augmentation. However, it lacks adaptability, donor side morbidity, difficulty of fixation and stability.

**Material and Methods:** 36 Y. male with a large bony defect following history of surgical removal of upper central incisors. Clinical examination showed loss of contour of alveolar buccal bone with large depression at the vestibular side. The flap was totally elevated; granulation tissue in the bed was excised. Lamina was dipped in warm saline for 7 minutes, then a piece was cut fashioned to close the defect. The defect filled with collagenated corti-cancellous bone chips. The Lamina was fixed in place using 3.0 vicryl sutures to surround periosteum

**Results:** Lamina was tolerated to a convex shape restoring the contour. The flap was scored from its undersurface to allow stretch and complete coverage of Lamina. Minor complications like edema and lip swelling developed post operatively increased after 72 hours and then regress totally after 7 days. Slight dehiscence appeared at crestal palatal interface which was treated with careful cleaning and irrigation completely resorbed after 10 days. CBCT after 6 months reveals valuable bone formation

**Conclusion:** Versatility and adaptability of the Cortical Lamina and easy way for fixation provide a good solution in such a case without secondary surgery for bone augmentation with high morbidity of the donor side. This case report demonstrates the possibility of using Cortical Lamina in small-medium sized alveolar bone defects

Topic: Clinical tips and cases: Grafting and augmentation

## P1019

### Guided Bone Regeneration in the anterior sector – a 3 year clinical case

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**Aim:** Oral rehabilitation with implants is today a clinical option scientifically proven and therefore its use has suffered a large increase in daily clinical practice. To obtain functional and aesthetic outcome in the rehabilitation with implants its essential adequate bone availability, in the vertical and horizontal dimension, and adequate soft tissues too. When the bone availability is committed it's necessary recover to guided bone regeneration (GBR) in order to improve the adequate bone volume. It is demonstrated that bone regeneration combined with bone graft and membrane achieves better results in terms of quantity and quality of regenerated bone that only membrane or bone graft alone. We will present 3 year follow up of a clinical case of a guide bone regeneration for implant placement.

**Material and Methods:** Female patient that have lost the 21 teeth for trauma uses a removable partial prosthesis and pretends a fixed rehabilitation. In order to achieve a functional and aesthetic result it was necessary, 6 months previously to the implant placement, recovered the horizontal dimension of the buccal bone with guided bone regeneration (xenograft bone and collagen membrane).

**Results:** 3 years after implant placement it's possible to see the good aesthetic outcome achieved with the recovery of the buccal bone using guided bone regeneration

**Conclusion:** Guided bone regeneration it's a predictable procedure that allows recovering the buccal bone and improve the shape the soft tissues around the crown.

Topic: Clinical tips and cases: Grafting and augmentation

## P1020

### A minimally invasive technique for sinus elevation with simultaneous implant placement in the extremely atrophic maxilla

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**Aim:** Introduction: The literature is suggestive of a two-stage procedure for sinus floor elevation and dental implant placement when maxillary alveolar crestal bone height is  $\leq 4$  mm. However, this results in prolonged treatment time, additional cost and patient discomfort, with the latter resulting in prolonged patient morbidity. The presented report describes a minimally invasive single-stage technique for crestal sinus floor elevation, with simultaneous implant placement, when the residual alveolar crestal bone height is  $\leq 4$  mm.

**Material and Methods:** Case report: A novel clinical technique for single-stage crestal elevation of the maxillary sinus floor membrane and alveolar ridge augmentation, based on the osteotome technique and using a vascularized pedicle bone graft was developed for clinical cases when maxillary alveolar crestal bone height is  $\leq 4$  mm. To date, over 30 dental implants have been placed in 12 patients using the presented technique and all implants have been restored and remained functional with sound bone levels as observed at the one-year review visit.

**Results:** Discussion: In contrast to previous recommendations using a two-stage approach for implant placement in the severely resorbed maxilla, the presented technique allows vertical bone augmentation into the sinus cavity and simultaneous implant placement using a single-stage approach involving a vascularized pedicle bone graft; thereby preserving the osteogenic potential of the sinus floor membrane.

**Conclusion:** The presented single-stage technique combines the minimally invasive approach of the osteotome technique with a large augmentation volume and implant placement when alveolar crestal bone height is  $\leq 4$  mm, otherwise requiring more extensive surgery and secondary implant placement.

Topic: Clinical tips and cases: Grafting and augmentation

## P1021

### Horizontal ridge augmentation: treatment options and decision-making

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**Aim:** The most challenging treatment in implant oral rehabilitation is the obtention of a correct bone availability for the ideally prosthetic position of the implant.

As many techniques are available for horizontal ridge augmentation and the selection of the more indicated one is not always clear, a treatment decision tree is proposed in this presentation trying to summarize all the options described in the literature. An analysis of which is the most suitable technique for every different situation will permit an adequate decision-making.

**Material and Methods:** A review of the literature in PubMed database has been performed. The keywords were: horizontal ridge augmentation, autogenous block bone graft, GBR, split crest, horizontal ridge augmentation, collagen membrane, non resorbable membrane.

After analysis of the literature a decision tree is proposed in terms of timing of implant placement respect to GBR procedure and choosing the right technique for each situation. Some clinical cases are presented to support the review of the literature and the decision tree.

**Results:** According to the literature different techniques are available for bone augmentation. Each one of these are indicated for different kind of bony defects.

**Conclusion:** The rehabilitation with dental implants requires of bone augmentation in most of the cases due to the resorption of the alveolar ridge after the tooth extraction. When dealing with this situation some decisions have to be made regarding which is the right technique for bone augmentation for each kind of defect. Taking the good decisions at the right time will make the difference in short and long term outcomes.

Topic: Clinical tips and cases: Grafting and augmentation

## P1022

### Management of an extraction site: a case report

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Casablanca/Morocco

**Aim:** Introduction

Extraction of teeth results in resorption of the alveolar process in both a vertical and horizontal direction. If the bone resorption was significant enough, then placement of an implant may become extremely challenging, that's why regenerative procedures are used for socket preservation, horizontal and vertical augmentation.

**Material and Methods:** Case report:

A 30 years old woman consults for a soft and hard tissue defects resulting for infection and trauma of central incisors. This create an anatomically less favorable foundation for ideal implant placement.

Free gingival graft followed by a guided bone regeneration were used to increase the tissue. An xray follow up before bone regeneration, 2 years and 4 years after show us the bone augmentation.

**Results:** Discussion

Guided bone regeneration hold a long term promise and played a major role in implant reconstruction; The thickness of soft tissues is very important.

**Conclusion:** the management of the extraction site enable us the placement of the implant

Topic: Clinical tips and cases: Grafting and augmentation

## P1023

### Alveolar nerve transposition for treatment of paresthesia caused by implants located in mandibular canal

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**Aim:** The most common limitation of implant placement in posterior mandible is mandibular nerve. The aim of the present report is to present the treatment of a dental implant which was inserted into mandibular nerve canal.

**Material and Methods:** A 50 years old woman referred to our clinic because of paresthesia and chewing discomfort. In radiographic examination, two implants were located in mandibular canal. A piezo-surgery was used to perform osteotomy on buccal mandibular bone. Then the mandibular nerve was moved buccally from under the mesial implant but this was not possible for the distal implant. So distal implant was removed and defect was filled with bone graft. The mandibular nerve was moved buccally than bone graft was applied between mesial implant and nerve. Finally guided bone regeneration procedure was used to close buccal side of mandibula.

**Results:** One week after surgery paresthesia was begun to healing partly. All complaints of the patients healed at two months.

**Conclusion:** Removing the implants located in mandibular canal by using trephine burs may cause excessive bone loss and irreversible nerve injury. Alveolar nerve transposition with piezosurgery is a safe method in these situations.

Topic: Clinical tips and cases: Grafting and augmentation

## P1024

### Sinus bone formation after Schneiderian membrane elevation and implant placement : an radiologic evaluation of 28 patients treated with 35 implants (1 to 3 year follow-up study)

N. Strube

Nantes/France

**Aim:** PURPOSE : Implant supported prosthetic restorations in the severely atrophic posterior maxilla have been successfully performed for the last 2 decades with various sinus augmentation techniques. The use of grafting material is anticipated to be necessary. However, recent studies (Lundgren S 2004; Thor 2007; Fermergard 2009; Cricchio 2011; Volpe 2011) have demonstrated that the elevation of the Schneiderian membrane with simultaneous implants placement result in bone formation. OBJECTIVES : To evaluate the radiographic results of bone formation around implants inserted in a void space created by the elevation of the sinus membrane without adding any bone grafting material.

**Material and Methods :** Twenty eight patients with 2,5 to 9 mm of residual alveolar bone were consecutively included from January 2009 to September 2011. 37 AstraTech implants were placed in 28 sinus. The sinus mucosal lining was elevated and implants

were installed in the residual subantral bone without adding any bone grafting material. CBCT or periapical radiographs were performed immediately post surgically, 4 to 6 months post surgically and then annually to evaluate bone formation.

**Results:** All implants were stable after 6 months. The Radiographic examination demonstrated new bone formation in 78.7 % of the cases after 6 months. The average bone gain in the sinus was 5.81 mm +/- 2.22mm after a minimum of 6 months.

**Conclusion** Sinus membrane elevation and immediate implant placement without the use of additional bone grafting material was found to be a predictable technique. We believe that this technique reduces the risks of morbidity associated with bone graft harvesting. Further histologic analysis are needed to confirm these findings.

Topic: Clinical tips and cases: Grafting and augmentation

## P1025

### Managing Sinus Graft Complications: Closure Of An Oro-Antral Fistula Derived From A Failed Sinus Graft With The Buccal Fat Pad and Subsequent Sinus Re-Graft After 4 Months. A Case Report.

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<sup>1</sup>Loma Linda/United States of America, <sup>2</sup>Bari/Italy

**Aim:** Grafting the floor of the maxillary sinus is a very common surgical intervention for increasing alveolar bone height prior to implant placement. However, different complications may occur during and after the sinus graft. This report describes a case in which a large oro-antral fistula, a consequence of a failed sinus graft, was closed and the sinus was successfully re-grafted four (4) months after the fistula closure.

**Material and Methods:** A 62 year old medically compromised female patient underwent a sinus graft procedure. The healing was uneventful with mild post-operative pain and swelling. At one (1) month post-operative check, the patient presented with an oro-antral fistula. Clinical examination did not show perforation of the sinus membrane, but most of the graft material was lost. The CBTC (Cone Beam Computerized Tomography) showed a bony defect with a large resorption of the alveolar bony crest. The oro-antral fistula was successfully closed by means of the buccal fat pad. Four (4) months after fistula closure the sinus was re-grafted. The remaining fat-like tissue was removed from the sinus cavity and the sinus was grafted with mineralized bone allograft. Two (2) layers of resorbable collagen membrane were used to attain guided bone regeneration (GBR) of the lost alveolar crest and to close the lateral bony window.

**Results:** Closure of the fistula, re-grafting of the sinus and guided bone regeneration of the lost alveolar crest were successfully attained.

**Conclusion:** Sinus graft complications can be resolved by following the proper surgical technique.

## Topic: Clinical tips and cases: Grafting and augmentation

**P1026****The position of the alveolar nerve in relation to the mandibular cortex**S. Hienz<sup>1</sup>, M. Becker<sup>2</sup>, C.W. Ulm<sup>3</sup>, A. Gahleitner<sup>3</sup><sup>1</sup>New Orleans/United States of America, <sup>2</sup>Wien/Austria, <sup>3</sup>Vienna/Austria

**Aim:** The distance of the inferior alveolar nerve to the mandibular cortex and the linea obliqua is of great importance in order to reduce the morbidity during graft harvesting from the retromolar region. Therefore, the aim of the present study was to identify both the average value of the distance of the mandibular canal to the mandibular cortex and to the linea obliqua

**Material and Methods:** The computed tomography (CT) archive of the Dental Radiology Department of Oral Surgery at the Bernhard Gottlieb University Dental Clinic was used in the present study. 55 CTs were randomly selected using a randomizer software and the distances of the inferior alveolar nerve to the mandibular cortex and the linea obliqua were determined.

**Results:** CTs from 17 men and 38 women with a mean age of 44.8 years were used. The average values of the distance from the nerve to the linea obliqua vary on the left side, on average, between 12.9 mm and 14.4 mm and on the right side between 12.4 mm and 14.0 mm. The average values of the distance of the nerve to the buccal mandibular cortex were between 3.9 mm and 5.6 mm on the left side and 3.9 mm to 5.8 mm on the right side.

**Conclusion:** Our data suggests that the retromolar region appears to be a possible site to harvest bone. The measured distance from the cortex to the inferior alveolar nerve seems to allow for adequate bone harvesting.

## Topic: Complications of implant therapy

**P1028****Treatment of Peri-Implantitis Through Microsurgical Regeneration**P.C. Fritz<sup>1</sup>, D.M. Lavoie<sup>1</sup>, W. Ward<sup>2</sup><sup>1</sup>Fonthill/Canada, <sup>2</sup>St. Catharines/Canada

**Aim:** The growing incidence of peri-implantitis is staggering. Novel strategies to address this clinical problem need to be developed. Numerous patient and defect parameters need to be considered when treating peri-implantitis. Furthermore, the correct approach to treat the defect is critical for a successful outcome. A microsurgical approach is a predictable and effective strategy to regenerate significant bone defects around failing implants.

**Material and Methods:** To regenerate osseous defects around diseased dental implants, several essential interrelated components of a microsurgical approach are required: strict and appropriate patient, tooth and defect selection criteria, clinical ability, biomaterials (enamel matrix proteins and allografts), specialized instrumentation, flap design, wound closure techniques and carefully presented post-operative instructions the patient faithfully follows during the healing period.

**Results:** Regenerative surgery using minimally invasive microsurgical techniques is an attractive alternative to traditional

techniques and is associated with fewer complications and has a higher predictability of a successful outcome for the patient. Minimally invasive microsurgery is not new, but when used with innovative flap designs, specialized instruments, the correct use of enamel matrix proteins, primary flap closure and strict pre- and post operative protocol, a predictable positive outcome is achieved for the patient. Moreover, patients self-report a less painful recovery.

**Conclusion:** Microsurgical regeneration using enamel matrix proteins is a low risk and highly predictable procedure if appropriate patients are selected.

## Topic: Complications of implant therapy

**P1029****Implant peri-apical lesion: a case report with a 5-year clinical and radiographic follow-up**

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Ancona/Italy

**Aim:** Introduction: Implant peri-apical lesion (IPL) or retrograde peri-implantitis is defined as a rapid infective, clinically asymptomatic periapical lesion (diagnosed as a radiolucency) in which the coronal portion of the implant achieves a normal bone to implant interface. Microbial involvement from the implant site, the extracted teeth or adjacent teeth, generation of excess bone heat during implant placement and premature loading from inadequate relief of interim prostheses were considered among the probable causes. Maxillary premolars are usually more prone to periapical lesion. It usually develops shortly after implant insertion and is further classified into inactive (non infected) or active (infected) IPL depending on the presence or absence of symptoms

**Material and Methods:** Case Report: A 43 year-old woman came to our observation with a problematic maxillary left first premolar (tooth#24). An immediate post-extractive implant was planned. The tooth was atraumatically extracted and the socket carefully curetted. Surgical site was prepared according to the manufacturer indications. A 3.75x11mm implant was placed. The flap was then repositioned to obtain a primary wound closure and sutured with mattress and interrupted resorbable sutures. An immediate post-operative radiograph was performed. Three months following the fixture placement the patient was seen on an emergency basis for pain at the implant site. It was observed the formation of a sinus tract on the facial aspect of the implant. The sinus tract was associated with mild pain and tenderness. A radiograph revealed a periapical radiolucency on the implant. The patient was prescribed penicillin, 1000 mg tid for 7 days, and nimesulide for pain control. Four days later, she was seen for definitive treatment. A full-thickness flap was elevated buccally. Vertical releasing incisions were made and a large formation of granulation tissue was noted at the apex of the implant. The granulation tissue was removed with plastic and stainless hand instruments. A tetracycline paste (250 mg powder mixed with sterile water to form a paste) was placed into the defect and around the implant. The area was then rinsed and irrigated copiously, this procedure was repeated. A bioabsorbable membrane was placed over the defect. After final rinsing of the defect, the flap was repositioned and sutured with resorbable sutures. The patient received antibiotics two times daily for one week (penicillin).

**Results:** Discussion: The 1-month check-up demonstrated no



pain or discomfort for the patient. No sign of infection was noted. At 1-year follow-up, the patient reported an uneventful healing with no further symptoms. A periapical radiograph showed new bone formation at the apical region of the implant. Peri-apical radiographs, Cone-Beam exam and clinical assessment made five years after the implant placement revealed complete bone fill into the previous lesion area and continuous stable bone levels around the implant. Five year follow-up clinical and radiographic assessment with cone-beam exam showed complete healing of the bone.

**Conclusion:** Within the limits of this case report it is possible to state that GBR principles applied to IPL could successfully solve this rare lesion.

## Topic: Complications of implant therapy

### P1033

#### INFLUENCE OF DIABETES ON THE OSSEOINTEGRATION AND SUCCESS OF DENTAL IMPLANTS. A LITERATURE REVIEW.

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**Aim:** The increasing prevalence of diabetes mellitus in the general population in recent years makes us special interest in knowing the specific considerations required for implant treatment in these patients. Derived from the systemic conditions, some micro- and macro-vascular complications. Dental implants osseointegration and success will be influenced by these conditions. The aim of this poster is to review the literature about the effect of diabetes on the osseointegration and success of dental implants and soft tissue healing.

**Material and Methods:** A Literature review of scientific articles was performed searching in the PubMed digital database and the Library of the International University of Catalonia, based on randomized clinical trials, reviews, consensus reports, case reports and experimental clinical cases. All were english-language articles published in the last ten years.

**Results:** Osseointegration in diabetic patients is impaired due to decreased tissue vascularization and reduced healing process. The result is a lower formation of bone, less bone to implant contact ratios and diminished bone density in general. Risk factors control is indicated in diabetic patients, performing a plasmatic glycemic control, and taking special considerations pre-, intra- and post-operative, since they have high susceptibility to infection and implant failure.

**Conclusion:** The implant success and osseointegration and also soft tissue healing are impaired in diabetic patients, but diabetes is not an absolute contraindication for implant treatment.

## Topic: Complications of implant therapy

### P1034

#### Implant overloading and parafunctions: avoiding and managing complications

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**Aim:** The aim of this study was to show the destructive effects of abnormal occlusal forces on implant supported prostheses in patients with bruxism, abnormal habits and other parafunctions, and to focus on concepts and the clinical procedures to reduce the potential risk factors for implant failure.

**Material and Methods:** 40 TMD patients were compared to 40 no-TMD patients in which were inserted 430 implants with the same features as number, size position, design. Another experimental group of 50 TMD patients treated by prevention protocol was assessed. Were considered type of restoration, cemented or screwed, malocclusion type, smoking, load timing. The heavy force of compression, clenching and grinding, as in bruxism, simultaneously applied strong pressures to the implants, crestal bone, restorations and temporomandibular joints. This was a potential risk factor for crestal bone loss, loss of integration before and after restoration, abutment screw loosening and fracture, implant fracture, decementation of restorations and fracture of the porcelain.

**Results:** The 5 years follow-up showed a 58% of soft tissues, bone and prosthetic complications in TMD patients versus a 11% in non TMD patients ( $P < 0.01$ ). When TMD patients were undergone to occlusal overload prevention protocol, the complications were diminished to 13% ( $P < 0.01$ ).

**Conclusion:** Implants with platform switching could avoid complications and enhance osseointegration success rate. Developing treatment plan that control the chronic bruxism through night-guards and an occlusal adjustment protocol to modify the occlusal forces on implants and their restorations, patients with temporomandibular disorders and bruxism can be candidates for implants.

## Topic: Clinical Research: Implant Therapy outcomes

### P1035

#### Influence of Piezosurgery on the Postoperative Outcomes in Implant Site Preparation: A Pilot Study

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Rome/Italy

**Aim:** This study aims at comparing the clinical outcomes, after implant placement, following piezoelectric and conventional site preparation, in terms of bone healing and patient discomfort.

**Material and Methods:** Four female patients, aging from 46 to 67, were involved in this study, for a total of 7 implant site preparation. Five implants were placed in posterior sites, two in anterior sites. Four implant sites were prepared via conventional drilling techniques as per manufacturer instructions (3i/Neoss), while three were prepared via piezoelectric (Mectron) technique

using the manufacturer Implant Prep Kit. Marginal implant bone level was assessed, for each implant, radiographically, immediately after the insertion, at one week, at one month, at two months and at three months after implant placement. Bone loss around implants was measured using intraoral radiographs and ImageJ 1.42 (NIH public domain software). Patient discomfort was assessed, immediately after the surgical procedure, by means of a visual analogue scale (VAS), asking to draw a sign on a 100mm line where 0mm is "no pain" and 100mm is "maximum pain".

**Results:** Mean values show an average bone loss, over a three months period, of 0,81mm for implants placed with conventional techniques and 0,63mm for implant placed with piezoelectric techniques. VAS measurements gave mean values of 2mm for conventional technique group and 1mm for piezoelectric group.

**Conclusion:** Results of this preliminary study imply that the piezoelectric implant site preparation affords similar postoperative effects, both in biological responses and in patient comfort. However, analysis of a larger number of cases is needed to draw more sound conclusions.

## Topic: Clinical Research: Implant Therapy outcomes

### P1036

#### A 4 years prospective clinical study of 322 SPI® implants.

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**Aim:** In the recent years, extensive research on the effects of alterations in surface chemistry has also been translated into potential clinical benefits. SPI ELEMENT surface technology provides higher bone-to-implant contact and more implant stability (6-8 weeks). This suggests an increase of osseointegration that may be reflected into an improved initial implant stability. The aim was to determine the average success rate and to analyze the causes of implant failure.

**Material and Methods:** In the present 4 years prospective study a total of 322 SPI ELEMENT implants were performed in 152 patients (75 females (48,1%) and 78 males (51,9%) aged 52.18 years on average; range 21-83 years), with a mean follow-up of 4 years. Data recorded included patient age and sex, the number, length, diameter and type of implants, their location, preoperative and postoperative incidences, type of edentulism, primary stability, bone quality, guided bone regeneration technique, submerged and emerged healing and the prostheses fitted.

**Results:** After 4 years of follow-up, the implant success rate was 98.4%. In 3 patients a total of 3 implants failed during the osseointegration period, while in 2 patients a total of 2 implants failed following dentures placement. The failures were mainly attributed to an overloading upon tightening in the osseointegration period and tobacco consumption. Significant relation was observed between implant loss and the pathology, (chi-square;  $p = 0,019$ ).

**Conclusion:** Thanks to the advances in the field of surface treatment with this type of self-tapping dental implant is an overall success in the field of implant treatment.

## Topic: Clinical Research: Implant Therapy outcomes

### P1037

#### Use of Cone-Beam Computerized Tomography in Regenerative Treatment of Peri-Implant Defects in Anterior Maxilla

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**Aim:** Immediate implant placement into fresh extraction sockets is often associated with residual bone defects between the implants and the bony walls. Cone-beam computerized tomography (CBCT) is a recent technology with increasing applications in quantification of the regenerative procedures in dental sciences. The aim of this study was to compare the CBCT and clinical measurements of osseous regeneration around implants placed in fresh extraction sockets.

**Material and Methods:** Twenty two implants were immediately placed in fresh extraction sockets in anterior maxillae of nine patients. After randomization, one group received BDX with platelet rich plasma (PRP; n=11) and the other group received DFDA with PRP (n=11). In addition to direct clinical measurements, CBCT analyses were done at the day of implant placement and 9 months after surgery.

**Results:** CBCT values and clinical measurements were correlated ( $p < 0.05$ ). There was no difference between two different grafting techniques.

**Conclusion:** CBCT provides a reliable method for measurement of the changes over time in response to regenerative procedures around dental implants.

## Topic: Clinical Research: Implant Therapy outcomes

### P1038

#### Longitudinal changes in soft tissues around single turned implants after 16 to 22 years of function

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**Aim:** To evaluate longitudinal changes of soft tissues around single turned dental implants after 16 to 22 years of function.

**Material and Methods:** Patients treated with single turned implants in the Dental Specialist Clinic in Malmö, Sweden, between 1987 and 1993 were re-examined. Clinical photographs were taken for calculation of the Pink Esthetic Score and digital measurement of papilla heights and crown lengths perpendicular to a reference line at the gingival zenith. Using digital calibration techniques, these data were compared to baseline photographs, allowing calculation of longitudinal changes.

**Results:** 20 patients treated with 23 single implants had available photographs at both time intervals. The mean time difference between the two photographs was 17.1 years (range 15-20). The mean age at implant placement was 22.9 (range 15-40). The mean PES was 7.5 (range 3-12) at baseline compared to 7.9 (range 4-13) at follow-up, the difference being not statistically significant. No

statistically significant long-term changes could be demonstrated for papilla heights nor for position of the gingival zenith between the two time intervals ( $P>0.05$ ). Three implants showed a recession development of more than 1mm, whereas 3 showed a gain of more than 1mm. Distal papilla heights were significantly lower compared to mesial papilla heights at the follow-up investigation ( $P=0.014$ ) but not at baseline.

**Conclusion:** PES of single crowns placed between 1987 and 1993 were low, but did not change significantly over time. In general, no significant longitudinal changes to papilla heights or gingival level could be demonstrated. After 16 to 22 years of function papilla heights were lower at distal compared to mesial sites.

## Topic: Clinical Research: Implant Therapy outcomes

### P1039

#### Role of keratinized mucosa in the maintenance of periimplant soft tissue health

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**Aim:** This study investigated the effect of periimplant keratinized mucosa on dental implant maintenance via revealing the correlations between keratinized mucosa amount and some clinical parameters of periimplant health.

**Material and Methods:** Thirtyfive dental implants were retrospectively evaluated in an implant patient population that were compliant for systematic maintenance care. Keratinized mucosa width (MW) levels were collected in each implant with Silness-Löe plaque index (PI), Löe-Silness gingival index (GI), bleeding on probing (BOP), probing pocket depth (PPD), mucosal recession (MR) and probing attachment level (PAL). Correlations between MW and the clinical parameters were assessed by Spearman Correlation test.

**Results:** MW was  $\geq 1$  mm in all implants and the median MW value was 4 (1-6) mm. There were negative correlations between MW and BOP ( $r = -0.48$ ), between MW and MR ( $r = -0.46$ ) and between MW and PAL ( $r = -0.40$ ) ( $p < 0.05$ ).

**Conclusion:** Within the limits of the study, it may be concluded that existence of keratinized mucosa around dental implants by means of its width may have limited effects on the maintenance of periimplant health.

## Topic: Clinical Research: Implant Therapy outcomes

### P1040

#### Effect of a controlled-release chlorhexidine chip versus topical chlorhexidine gel in the treatment of peri-implantitis: a randomized controlled clinical trial

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**Aim:** The objective of this prospective, randomized, parallel arm

study was to evaluate the effectiveness of a locally delivered chlorhexidine chip as an adjunct to mechanical treatment of peri-implantitis and to compare it with an adjunctive treatment using 1% chlorhexidine gel.

**Material and Methods:** Thirty-four patients with at least one implant with bleeding on probing (BOP) and probing pocket depth (PPD)  $\geq 5$  mm were given oral hygiene instructions and non-surgical mechanical debridement at the implant sites. The patients were then randomly assigned to receive a controlled-release chlorhexidine chip or chlorhexidine gel. Recordings of plaque index, gingival index, BOP, PPD, clinical attachment level (CAL), and gingival recession were recorded at baseline, 1, 3, and 6 months following treatment.

**Results:** Both treatments resulted in improvements of PPD and CAL compared to baseline. After 6 months, a reduction in PPD of  $1.04 \pm 0.86$  mm and  $1.31 \pm 0.96$  mm was observed for the chlorhexidine chip and chlorhexidine gel groups, respectively ( $p > 0.05$ ). The observed CAL gain was  $1.16 \pm 1.06$  mm and  $1.24 \pm 0.97$  mm for the chlorhexidine chip and chlorhexidine gel groups, respectively ( $p > 0.05$ ). Similarly, no significant differences were found between the groups regarding BOP, PI, and GI 6 months after therapy.

**Conclusion:** Both treatments had similar positive effects on clinical parameters when used as an adjunct to mechanical treatment of peri-implantitis lesions.

## Topic: Clinical Research: Implant Therapy outcomes

### P1041

#### Veillonella sp. Infection as a Rare Cause for Multiple Early Dental Implant Failures: A Case Report

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**Aim:** Infection, overheating, premature loading and impaired healing are the main factors associated with early failure of dental implants. Multiple implant failures in the same patient, supports the evidence that individual characteristics play an important role in the early failure process. *Veillonella* are small, strict anaerobic, nonmotile, nonsporulating, capsule, Gram-negative cocci that lack capsule. The objective of this study was to investigate the possible association between, a amoxicillin-resistant *Veillonella* spp. and the early multiple implant failures in the same patient.

**Material and Methods:** A 55-year-old female patient had peri-implant radiolucencies of two adjacent implant sites 3 months after surgical placement. Aerobic and anaerobic culture techniques were used to study the peri-implant microflora at sites with implant failures. An amoxicillin-resistant *Veillonella* bacteria was isolated.

**Results:** The cause and mechanism of the early implant failure are still obscure. In humans, *Veillonella* spp. are routinely isolated from the oral cavity, the upper respiratory tract, small intestines and vagina. Members of the genus *Veillonella* have been suggested as causes of opportunistic infections. More often, they are isolated as part of a mixed bacterial culture. It has been suggested that oral *Veillonella* spp. are early colonizers of dental biofilms. The pathogenic roles of *Veillonella* spp. in oral infections have not yet been fully clarified, nor have the distribution and frequency of these organisms at the species level in biofilms at various sites in the human oral cavity or in infectious lesions.

**Conclusion:** The present case show that amoxicillin-resistant *Veillonella* -associated peri-implantitis can be a risk factor for multiple early implant failures.

Topic: Clinical Research: Implant Therapy outcomes

## P1042

### Esthetic outcome of single turned implants after 16 to 22 years of function

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**Aim:** To evaluate the esthetic outcome of single dental implants after 16-22 years of function.

**Material and Methods:** Patients treated with single turned implants in the Dental Specialist Clinic in Malmö, between 1987 and 1993 were re-investigated. Clinical photographs were taken for analysis with the Pink and White Esthetic score (PES/WES). Differences between the parameters of the PES and WES were analysed with the Friedman test.

**Results:** 39 patients treated with 42 single implants were selected for the esthetic evaluation with PES/WES. The mean follow-up was 18.4 years (range 16-22). The mean age at implant placement was 23.9±7.44 (range 15-52) and 42.3±7.46 (range 33-69) at the follow-up examination. The mean PES and WES were 7.6±2.87 (range 2-14) and 5.4±2.32 (range 1-10) respectively. The PES was (almost) perfect (12-14), favorable (8-11) or unacceptable (0-7) in 7.2%, 47.6% and 45.2% of the cases respectively. Corresponding WES results were 9,5% (9-10), 40,5% (6-8) and 50,0% (0-5). The lowest mean scores were alveolar process deficiency, tooth form and volume. The highest mean scores were soft tissue contour and tooth surface texture. Friedman test results showed a significant difference between the parameters of the WES (P=0.003), but not the PES (P=0.052). Pairwise analysis showed better outcomes for crown surface texture than all other WESparameters.

**Conclusion:** The esthetic outcome of single crowns on turned implants after 16-22 years is rather low, showing over 45% with unacceptable results. Whether this is due to deteriorating esthetics over time or poorer esthetic requirements during the late eighties, remains to be investigated.

Topic: Clinical Research: Implant Therapy outcomes

## P1043

### Plaque reduction of a sonic and manual toothbrush in subjects with osseointegrated dental implants - a prospective longitudinal study (12 months). Clinical, microbiological and immunological results.

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**Aim:** The aim of the present study was to investigate the plaque reduction of a sonic and manual toothbrush in subjects with osseointegrated dental implants.

**Material and Methods:** The study included 36 male and 47 female

partially edentulous patients (45-78 years, mean: 59.8 years), which where randomly assigned to one of two treatment groups: sonic-toothbrush group (STB-group, Philips Sonicare FlexCare) (n=42) or manual-toothbrush group (MTB-group, Oral-B P-40) (n=41). Clinical, microbiological and immunological examination was performed blinded at baseline, after 3, 6, 9 and 12 months. Microbiological analysis was performed with real-time PCR. Immunological analysis (PGE2) was performed with chromatography-electrospray spectrometry (LC-MS/MS-analysis).

**Results:** The plaque index at implants and teeth between baseline and 12 months showed no significant difference between sonic and manual toothbrushes. At the end of the study there were no significant changes in the primary endpoint (PLI), secondary endpoints (BOP, GI, PD, GR, CAL), and the microbiological (Eu, Aa, Pm, Pg, Pi, Dp, Cr) and immunological (PGE2) outcomes at implants and teeth in both groups.

**Conclusion:** The present study showed no difference between a sonic and manual toothbrush in plaque reduction at implants or teeth. The fact that all measured parameters in both groups showed no significant changes after 12 months proved that both toothbrushes can maintain healthy gingival and periimplant tissue.

Topic: Clinical Research: Implant Therapy outcomes

## P1044

### Peri-implantitis treatment: a case series

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**Aim:** INTRODUCTION Biofilm formation on implants can endanger long-term success of osseointegrated implants. Peri-implantitis was identified in 28% to ≥ 56% of subjects. Therapy of peri-implantitis can compromise non-surgical and surgical phase. Regeneration of lost tissue should be included as an alternative of this treatment. The aim of this case series was to describe the clinical and radiographic follow-up of 11 patients with treated peri-implantitis.

**Material and Methods:** CASE REPORT Eleven patients treated for peri-implantitis involving a total of 16 implants, were followed-up for a 6 months to 6 years period. All cases presented suppuration, bleeding-on-probing and peri-implant bone loss. After diagnostic, the first non-surgical treatment phase comprised hygiene individual procedures, mechanical debridement and local application of antiseptics and antibiotics. In case of persistence of clinical signs and/or pocket depth ≥ 5 mm a second phase, surgical, with mechanical debridement, surface decontamination with antiseptics and antibiotics and xenograft bone regeneration was performed. In the subsequent clinical and radiographic follow-up period, all cases showed improvement in the clinical evaluation parameters and none implant was lost.

**Results:** DISCUSSION There is little reliable evidence about the most effective intervention for peri-implantitis therapy. According to some authors, the adjunctive use of local antiseptics, antibiotics and bone-substitutes can improve clinical parameters. Our results, based on chlorhexidine/minocycline applications and, when needed, on bone regeneration with xenografts are in agreement with these conclusions.

**Conclusion:** Within the limitations of this limited case series, we conclude that it seems possible to successfully treat peri-implantitis disease, at least on a medium term basis



Topic: Clinical Research: Implant Therapy outcomes

## P1045

### Randomized controlled trial of immediate loading of implants mozograu inhex® in the posterior region of the maxilla and mandible

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**Aim:** The aim of this randomized study was to evaluate bone level changes in immediate and early loaded implants.

**Material and Methods:** In 8 Male and 8 female 33 implants (MG InHex® implants, with Resorbable Blast Media surface) were placed in the posterior jaw, with two loading protocols: immediate loading (ILG) (18 implants) (within 48 hours) and conventional loading (CLG) (15 implants) (8 weeks). Examinations were performed at the time of surgery and one year and included periapical radiographs to compare differences in crestal mesial and distal bone level. Friedman statistical test was used for comparison between groups.

**Results:** 3 implants were placed in first maxillary premolars, 2 in first maxillary molar, 4 in second maxillary premolars, 18 in first mandibular molar, 6 in second mandibular molars position. 3 implants were lost in ILG before 8 weeks and none in CLG, the survival rate at one year was 84%. The following results were obtained: ILG mesial bone loss 0.74 mm ± 0.77, distal bone loss of 0.55 mm ± 0.75; CLG mesial bone loss 0.27 mm ± 1.01, distal bone loss of 0.01 mm ± 0.66. The differences were not statistically significant.

**Conclusion:** Given the limitations of this study MG InHex® Implants are safe and predictable in conventional loading procedures. Our data agree with those found in the literature, the implants with higher failure rate are in immediate loading group, and those that remain have the same behavior as the conventional loading

Topic: Clinical Research: Implant Therapy outcomes

## P1046

### Bacterial and inflammatory behaviour of implants in the early healing phase in chronic periodontitis

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**Aim:** To assess the pattern of early bacterial colonization at implants and teeth in patients with a history of chronic Periodontitis (ChP) as compared to a group of healthy subjects (H). Furthermore, the presence of host-derived markers at teeth and implants in the two subject groups was determined.

**Material and Methods:** Subgingival/submucosal plaque and gingival crevicular fluid (GCF) samples from 37 non-submerged healing dental implants and from the deepest tooth sites per quadrant were analyzed 2 to 5 months after implant insertion. The presence of periodontal pathogens was assessed by means of real-time polymerase-chain-reaction. Further, the levels of interleukin (IL)-1β, IL-8, IL-10, and secretory leukocyte

protease inhibitor (SLPI) as well as the neutrophil elastase activity were determined.

**Results:** 11 patients with ChP and 13 subjects without periodontitis were recruited for this study. Bacterial species associated with periodontitis were detectable both at teeth and implants. The presence was always the higher in the ChP-group; the difference was significant for *Porphyromonas gingivalis* and *Aggregatibacter Actinomycetemcomitans* both at implants and teeth. The levels of IL-1β were higher at teeth than at implants, in contrast more IL-10 was measured at the implants.

**Conclusion:** Dental implants inserted in periodontally compromised patients are colonized with periodontal pathogens within the first weeks of healing and inflammatory markers are present in higher levels at teeth as compared to implants.

Topic: Clinical Research: Implant Therapy outcomes

## P1048

### Effect of probiotics on peri-implant microbiota in smoking and non-smoking patients

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**Aim:** To study the effect of probiotics on bacterial species *Tannerella forsythia* (Tf), *Porphyromonas gingivales* (Pg), *Treponema denticola* (Td) y *Aggregatibacter actinomycetemcomitans* (Aa), as well as total bacterial load (TBL) in smoking and non-smoking patients.

**Material and Methods:** For detection of periodonpathogenic bacteria the IAI-PadoTest 4.5 (IAIAI Institute Inc., Zuchwil, Switzerland) was used, a system which detects Tf, Pg, Td and Aa using RNA probes. Patients were given the probiotic *Lactobacillus reuteri* Prodentis (PerioBalance™; Sunstar; Sweden) by one tablet every 24h dissolved in the mouth at night, for 28 days.

**Results:** 54 patients were included, 37 non-smokers (23 women) with a mean age of 61.1 ± 9.9 years and 17 smokers (8 women) with a mean age of 53.4 ± 7.7 years. The bacterial species Aa was found in none of the implants. Smoking patients had higher concentrations of Tf, Pg and Td, and higher TBL. In smokers Tf, Pg and Td decreased after administration of the probiotic, while TBL remained stable. In non-smokers Tf, Pg, Td and also TBL decreased after the administration of the probiotic.

**Conclusion:** With the limitations of the present study, the administration of probiotics may be a useful alternative to reduce bacterial load in both smoking and non-smoking patients.

Topic: Clinical Research: Implant Therapy outcomes

## P1050

### Effect of probiotic lactobacillus reuteri on periodontal and peri-implant microbiota in partially edentulous patients

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**Aim:** Evaluate if the probiotic *Lactobacillus reuteri* produces changes in the concentration of periodontal bacteria *Tannerella forsythia* (Tf), *Porphyromonas gingivalis* (Pg), *Treponema denticola* (Td), *Aggregatibacter actinomycetemcomitans* (Aa) and total bacterial load (TBL) in teeth and dental implants.

**Material and Methods:** a crossed, randomized, double-blind, placebo-controlled study was made. Partially edentulous patients with one or two dental implants in mandibular molars were studied. Contralateral teeth of the same arch were also evaluated. Patients were given the probiotic *Lactobacillus reuteri* Prodentis (PerioBalance™; Sunstar; Sweden) or a placebo, one tablet every 24h dissolved in the mouth, for 28 days. For detection of periodonpathogenic bacteria the IAI-PadoTest 4.5 (IAI Institute Inc., Zuchwil, Switzerland) was used, a system which detects Tf, Pg, Td, Aa and TBL using RNA probes. The level of significance used was  $< 0.05$  and the power of the study was 83%.

**Results:** 30 patients were included, and 60 teeth and 60 dental implants were analyzed. 26.7% were men and 73.3% women, with mean age  $56.5 \pm 6.6$  years. A significant decrease of Tf, Td and TBL was found in teeth after administration of the probiotic. In dental implants Pg, Td and TBL decreased significantly.

**Conclusion:** Administration of probiotics may be a useful alternative to reduce bacterial load in both teeth and dental implants.

Topic: Clinical Research: Implant Therapy outcomes

## P1051

### The influence of occlusal load on peri-implant tissue. A preliminary study.

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**Aim:** To analyze the relationship between occlusal load and peri-implant clinical parameters (probing depth, plaque index and crevicular fluid) in patients with implant-supported fixed prostheses in both arches.

**Material and Methods:** A prospective clinical study at a university clinic was performed. Patients with complete metal-ceramic fixed prostheses over implants in both arches were selected. Two groups were established according to the occlusal analysis performed using the computerized system of analysis T-Scan® III (Tesco, South Boston, USA). The maxillary implant closest to the point of heavier force was considered as the study group and the implant farthest from it with less occlusal load, as the control group. Occlusal load was removed from the implant study group to distribute occlusal forces between all implants and was verified by the T-Scan® III. Peri-implant clinical parameters were analyzed in both implants before and one month after the occlusal adjustment.

**Results:** Implants from the study group presented higher crevicular fluid volume ( $51.3 \pm 7.4$  UP) than control group ( $25.8 \pm 5.5$  UP), with statistically significant relationship. After the occlusal adjustment, no difference was observed between both groups ( $24.6 \pm 3.8$  UP and  $26 \pm 4.5$  UP respectively) ( $p=0.977$ ). No statistically significant relationship were found with the other clinical parameters ( $p>0.05$ ).

**Conclusion:** Analysis of peri-implant crevicular fluid offers a non-invasive means of studying the host response in peri-implant

disease and may provide an early indication of patients at risk for active disease. This study is the first clinical human study to examine changes in crevicular fluid after the removal of the occlusal load.

Topic: Clinical Research: Implant Therapy outcomes

## P1052

### Clinical and Radiographic Results of Early Loaded Dental Implants in Heavy Smoker Patients

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**Aim:** The aim was to provide detailed documentation focusing on clinical and radiographic outcome and complications of heavy smoker patients treated with implants.

**Material and Methods:** 23 heavy smoker patients with sufficient bone volume were operated and a total of 41 Straumann dental implants were placed. Following a two weeks healing period the implants were permanently restored with FMP crowns and bridges. Radiographic bone levels, conditions of the peri implant mucosa, implant survival and success rates are being observed from baseline to date.

**Results:** The over all success rate was found to be 98%.

**Conclusion:** This study indicate that in heavy smoker patients placement and early loading of Straumann dental implants may achieve a clinically predictable outcome

Topic: Clinical Research: Implant Therapy outcomes

## P1053

### Diagnostics of periimplant disease with molecular based methods.

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**Aim:** The aim of this study was to investigate the association of periopathogenic bacterial species in cases of periimplantitis using molecular methods.

**Material and Methods:** A total of 20 patients (11 women and 9 men) aged 32-67 years with periimplantitis were examined. Samples of exudates for investigation were obtained from periimplant sites. Periimplant pockets in assessed sites were 4.9-7.1 mm deep ( $6.0 \pm 1.1$  mm). Detection of periodontal pathogens DNA was performed with "Multident-5" (Russia) and "MicroIDent plus" (Germany) test-systems based on PCR and DNA-hybridisation.

**Results:** The results of molecular study have shown that most frequently detected species was *Fusobacterium nucleatum* (15 patients – 75%). DNA of *Parvimonas micra* was detected in 14 patients – 70%, *Campylobacter rectus* and *Eubacterium nodatum* – in 10 patients – 50%. *Capnocytophaga* (C.spp.) appeared in 6 patients – 30% and *Eikenella corrodens* was not found at all. DNA of chromogenic bacteria, such as *Tannerella forsythia* was detected in 13 (65%) cases, *Porphyromonas gingivalis* – in

10 (50%), *Aggregatibacter actinomycetemcomitans* - only in 4 (20%). *Prevotella intermedia* was found in 5 (25%) cases, *Treponema denticola* - in 6 (30%).

**Conclusion:** Therefore most frequently detected microorganisms were the following: *P. micra*, *F. nucleatum*, *C. rectus*, *E. nodatum*, *T. forsythia* and *P. gingivalis*, which are commonly found in patients with chronic periodontitis and can be one of the reasons for periimplant disease.

Topic: Clinical Research: Implant Therapy outcomes

## P1054

### Immediate loading in the esthetic zone using pre-shaped zirconium abutment: 12 months result of a prospective case series

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**Aim:** The aim of this study was to evaluate the effectiveness of pre-shaped zirconium abutments for immediate implant loading in the anterior maxilla.

**Material and Methods:** A total of 13 patients needing the placement of 1 or 2 implants in the esthetic zone were treated with RC Bone Level (Straumann). Implants were placed and immediately restored with a pre-shaped zirconium abutments and provisional resin crowns. Implant survival rate, biological and prosthodontic complications as well as peri-implant tissue status (papilla index) were recorded during a follow-up period of 1 year.

**Results:** A total of 14 implants placed in 11 patients (48,5 +/- 11,5) could be assessed for the entire follow-up period. 2 patients dropped out. After a follow-up period of 1 year, all implants fulfilled survival criteria for dental implants with regard to osseointegration, including the absence of peri-implant radiolucency, implant mobility, and pain. In 11 out of 14 implants, an improvement of the papilla index was observed from baseline to 1 year follow-up whereas 3 implants showed a decrease of this index.

**Conclusion:** The results suggest that immediately restored implants using a final pre-shaped zirconium abutment in esthetic zone display favorable implant and prosthodontic outcomes and seems to allow an adequate papilla index improvement in most of the cases.

Topic: Clinical Research: Implant Therapy outcomes

## P1055

### Comparison of two Methods measuring the Implant Stability of Dental Implants: Insertion Torque and Resonance Frequency Analysis

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**Aim:** Stability of dental implants is a decisive parameter for implant loading that can be evaluated by insertion torque (IT) and Resonance-Frequency-Analysis (RFA). IT and RFA measure the

bone to implant resistance and damping capacity, respectively, suggesting a possible discrepancy of the two methods.

**Material and Methods:** To test this assumption data from a total of 999 implants from 417 patients were included in this study. IT was measured by Osseocare® (Nobel Biocare, Gothenburg, Sweden) and RFA was determined by Osstell Mentor® (Integration Diagnostic AB, Gothenburg, Sweden). Bone quality, implant diameter, implant length, implant type, time of insertion and failure rate were recorded.

**Results:** A positive correlation of implant stability parameters between IT and RFA ( $r=0.35$ ;  $p<0.01$ ) was recorded. In both methods, the major determinants affecting the implant stability were bone quality and implant diameter. Among the 18 implants that failed within the observation period of two years RFA but not IT values were associated with the implant failure ( $p<0.01$ ).

**Conclusion:** The data suggest that IT and RFA are adequate methods to measure implant stability. The correlation between these two methods was moderate, indicating that the two methods are likely influenced by other parameters including those recorded.

Topic: Clinical Research: Implant Therapy outcomes

## P1056

### Comparison of Peri-Implant Bone Loss and Survival of Maxillary Intrasinus and Extrasinus Implants After 2 Years

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**Aim:** Low quality of the bone and insufficient bone due to the size of the sinus and resorption of the alveolar ridge decrease the long-term survival of implants in the posterior maxilla compared to other regions of the jaws. Surgical procedures to increase bone volume make it possible to place implants longer than 8 mm. In this situation sinus elevation makes it possible to place implants. We intend to evaluate peri-implant bone loss and survival of implants placed in elevated sinuses after 2 years and to compare with implants placed in the native posterior maxilla.

**Material and Methods:** Twenty-five implants placed in sinuses that had been reconstructed with Bio-Oss and healed after 9 months were compared with 30 implants placed in the posterior maxilla without any surgery. The groups were compared using probing pocket depth, bleeding on probing, Plaque Index and bone loss immediately after implant placement surgery and 2 years postoperatively. The criterion for implant survival was presence or absence of the implant in the oral cavity, which was recorded in relevant forms in both groups.

**Results:** Three implants were lost; one in control and two in grafted sinuses. No significant differences were observed in the survival rates. In general, the mean bone loss around intrasinus and extrasinus implants was not significantly different. In the same context, no differences were observed between bleeding on probing, Plaque Index and probing pocket depths of two groups ( $P=0.397$ ,  $P=0.637$  and  $P=0.224$ , respectively).

**Conclusion:** The survival and bone loss around intrasinus and extrasinus implants are similar.

## Topic: Clinical Research: Implant Therapy outcomes

## P1057

**evaluation of implant success rate; regarding to Radiographic Vertical Bone Loss.**

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5583/Iran

**Aim:** Vertical bone loss evaluations in the Nobel Biocare Replace® Select Tapered implant system in the human after one-year of loading time.

**Material and Methods:** This retrospective cross-sectional study was performed on 31

patients (14 men, 17 women; mean age, 60.39 years) receiving 170 implants (mean, 5.48 for each patient) of Groovy and Non-groovy designs in the Nobel Biocare Replace® Select Tapered TM system. The marginal bone loss was measured at mesial and distal aspects of the implants on OPG x-rays after one-year follow-up. The data regarding the patient's gender, age, history of disease, smoking, bone type at implant location, loading time of prosthesis and implant, implant design, diameter and length were recorded by the patients' records and interview. The data were subjected to multiple linear regression and Pearson coefficient ratio regarding different factors.

**Results:** The mean (standard deviation) distal, mesial and overall bone loss was 0.688 mm (0.851), 0.665 mm (0.849) and 0.935 mm (0.905), respectively in the studied implants. No significant differences were found regarding implant location, bone quality at the implant region, implant design and bone graft reception. In addition, no significant correlation was found between the occurred bone loss and implant diameter, length and number of used splints.

**Conclusion:** Due to the criteria mentioned for implant success in term of bone loss values after one-year loading time, Noble Biocare Replace® Select Tapered TM implant system is an acceptable treatment option for implant restorations in this regard.

## Topic: Clinical Research: Implant Therapy outcomes

## P1058

**Comparison the levels of Tumor Necrosis Factor-alpha and Interleukin-17 in gingival crevicular fluid of patients with peri-implantitis and a control group with healthy implants**

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Tehran/Iran

**Aim:** Some immune system products, called cytokines seem to have an important role in development of peri-implantitis and are useful for its monitoring. Therefore, the present study was conducted to compare the GCF levels of TNF- $\alpha$  and IL-17 between patients with peri-implantitis and healthy implants.

**Material and Methods:** In this study, 24 patients with peri-implantitis and 18 people with healthy implants referring to faculty of dentistry in Tehran university of medical sciences, were selected by available in 2010. Demographic data were recorded

and GCF sampling was performed by paper cons number 30. Samples were preserved in PBS preserver in -70 degree of centigrade, then were assessed concerning TNF- $\alpha$  and IL-17 levels by ELISA method. Data were analyzed by SPSS software, using descriptive indices and independent t test.

**Results:** Mean level of IL-17 in patients with peri-implantitis was significantly more than control group ( $19.8 \pm 16.0$  versus  $9.3 \pm 8.4$  picograms per site in 40 seconds,  $P=0.016$ ). Also, mean level of TNF- $\alpha$  in patients with peri-implantitis was more than control group ( $39.0 \pm 3.9$  versus  $14.5 \pm 9.0$  picograms per site in 40 seconds,  $P=0.000$ ).

**Conclusion:** The significant higher levels of TNF- $\alpha$  and IL-17 in patients with peri-implantitis compared to control group indicates the direct relationship between these cytokines and peri-implantitis and should be regarded for diagnostic procedures and immunomodulatory treatments

## Topic: Clinical Research: Implant Therapy outcomes

## P1059

**Radiographic outcomes of sinus floor elevation performed with a minimally-invasive technique.**G. Franceschetti<sup>1</sup>, R. Farina<sup>1</sup>, L. Minenna<sup>1</sup>, A. Rizzi<sup>1</sup>, C. Stacchi<sup>2</sup>, R. Di Lenarda<sup>3</sup>, R. Di Raimondo<sup>4</sup>, P. Minenna<sup>5</sup>, O.L. Riccardi<sup>6</sup>, A. Cucchi<sup>1</sup>, L. Trombelli<sup>1</sup><sup>1</sup>Ferrara/Italy, <sup>2</sup>Gorizia/Italy, <sup>3</sup>Trieste/Italy, <sup>4</sup>Palermo/Italy, <sup>5</sup>Foggia/Italy, <sup>6</sup>Torre Pedrera (rn)/Italy

**Aim:** to evaluate the radiographic outcomes of transcrestal sinus floor elevation (tSFE), when performed with a minimally-invasive technique (Smart Lift), and their association with patient-related factors as well as site-specific characteristics.

**Material and Methods:** tSFE was performed either with or without additional use of a graft biomaterial at 74 edentulous sites in 70 patients. In all cases, implants (length  $\geq 8$  mm) were placed concomitantly. Extent of sinus lift (SL) and the height of the graft apical to the implant apex (aGH) were assessed on periapical radiographs immediately after surgery and at 6 months after surgery.

**Results:** SL and aGH were 6.5 mm (IR: 5.4-7.6) and 2.5 mm (IR: 1.5-3.0), respectively, immediately after surgery, and shifted to 6.3 mm (IR: 5.5-7.2) and 2.3 mm (IR: 1.5-3.0), respectively, at 6 months post-surgery. Age, gender and smoking status were not associated with 6-month SL and aGH. 6-month SL was  $\geq 5$  mm in 80% of the patients and was negatively correlated with RBH ( $p < 0.01$ ,  $R^2 = 0.19$ ). The amount of aGH was not influenced by the extent of antral implant penetration.

**Conclusion:** Smart Lift is a valuable technique for tSFE procedures. A predictable, substantial displacement of the sinus floor was observed at 6 months post-surgery. The outcomes of tSFE procedures performed with the Smart Lift technique, as radiographically assessed, seem to be influenced by site-specific characteristics rather than patient-related factors.



## Topic: Clinical Research: Implant Therapy outcomes

**P1060****Immediate loading of self-tapping implants in the posterior mandible: 5-years results of randomized controlled clinical trial**

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Belgrade/Serbia

**Aim:** Objectives: The aim of present study was to compare clinical results of immediate and early loading self-tapping implants placed in posterior mandibles.

**Material and Methods:** Twelve patients with bilateral edentulous posterior mandibular were randomly assigned to treatment either with immediate (test) or early loaded implants (control). Seventy-two self-tapping implants with SLA surface ( $\bar{A}$  4,1/4,8 mm; length 8 and 10 mm) were analyzed in this study. Test implants (36) were loaded on the day of surgery and control implants 6 weeks later. Measuring of implant stability quotient (ISQ) was 0, 6th, 12th and 52nd week, of bone resorption, modified plaque and bleeding index was 1st and 5th years.

**Results:** After 5 years survival in the both groups was 100%. Mean value of primary implant stability was  $76.92 \pm 0.79$  ISQ. In the first six weeks ISQ values significantly increased in the test group ( $77.92 \pm 1.16$  vs.  $79.61 \pm 0.90$ ) as well as in the control group ( $7.92 \pm 1.05$  vs.  $77.55 \pm 0.99$ ). Significant longitudinally increased of ISQ value was recorded in test and control group. Differences between immediate and early loaded implants were statistically insignificant ( $p > 0.05$ ). At the 5 years, no statistically significant differences were found between immediate and early loaded implants with respect to mean crestal bone loss measurements ( $0.4\text{mm} \pm 0.24$  vs.  $0.8\text{mm} \pm 0.15$ ), mean bleeding index ( $0.22 \pm 0.11$  vs.  $0.25 \pm 0.11$ ) and mean plaque index ( $0.17 \pm 0.15$  vs.  $0.19 \pm 0.20$ ).

**Conclusion:** Based on these results the self-tapping implants inserted in posterior mandible can provide adequate primary stability value as the main factor for immediate and early loading protocol.

## Topic: Clinical Research: Implant Therapy outcomes

**P1061****Evaluation of clinical and radiological alteration after loading of dental implants : A 6 month study.**S. Coskuner<sup>1</sup>, I. Duran<sup>2</sup><sup>1</sup>Konya/Turkey, <sup>2</sup>Bolu/Turkey

**Aim:** Early marginal peri-implant bone loss defined as crestal region of successfully osseointegrated dental implants. The aim of this study is to learn more information about the implants by clinically and radiologically examining the peri-implant tissues before and after loading.

**Material and Methods:** Thirty- five bone level dental implants were placed on 10 systemically healthy patient. Prior to implant treatment the necessary periodontal treatments and oral hygiene instruction were given to the patients. The implants were clinically and radiologically tested before and after protetical loading. The subsequent visits post loading were performed at 1, 3 and 6. months and implant/tooth surface care and oral hygiene

instruction was repeated to the patients when they came for the visits if necessary. The implants were clinically assessed with probing pocket depth (SPD), modified plaque index (MPI), modified gingival index (MGI), keratinized tissue amount (KTA) and attached tissue amount (ATA). The bone loss amount (BLA) was evaluated with panoramic radiographs before loading and 6. months after loading. The amount of peri-implant sulcus fluid (PISF) was evaluated. For statistical comparisons paired-sample "t" test and Pearson's correlation analysis were used.

**Results:** At the end of the study PISF amount increase was observed at the subsequent measurements after loading and this increase was established as statistically significant ( $p < 0.05$ ). When BLA was evaluated, there was a correlation between ATA, KTA and BLA ( $p < 0.05$ ).

**Conclusion:** In the limit of this study KTA and ATA is essential for peri-implant health and maintenance of dental implants.

## Topic: Clinical Research: Implant Therapy outcomes

**P1062****Comparison of two concepts for implant retained dentures – a prospective, randomised study**

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Graz/Austria

**Aim:** The aim of this prospective, clinical study was to compare the implant stability and implant failure after immediate (group 1) and delayed loading (group 2) of four interforaminal implants with the Locator system with special indication for the elderly patient.

**Material and Methods:** The study population comprised 20 patients. The patients had to be aged over 60 years, they had to have an edentulous jaw with insufficient hold of the denture. Four implants per patient (Neoss Ltd., Harrogate, UK) were positioned in the anterior mandibula and supplied with the Locator®-abutment system. The implant stability was evaluated with Periotest® and Ostell® during surgery, after 3, 6 and 12 months postoperative.

**Results:** In total 80 implants were positioned. The mean values of the Periotest® and Ostell®-measurements increased over time in both groups. Periotest® mean values in group 1 were -5,53 intraoperative and -6,85 after 12 months. Ostell®-measurements were 76,15 intraoperative and 83,55 after 12 months. In group 2 the Periotest® -mean values were -3,98 intraoperative and -7,03 after 12 months. Mean values gained via Ostell® were 74,45 intraoperative and 81,74 after 12 months. There was no significant difference ( $p < 0,05$ ) between the results of the two groups. The survival rate of the implants during the observation period of 6 months was 100%.

**Conclusion:** The immediate as well as the delayed loaded implants show similar stability values after 12 months. Both methods can be used equally for fixation of lower total prostheses in the edentulous jaw especially as a simple concept for the elderly patient.

## Topic: Clinical Research: Implant Therapy outcomes

**P1063****The effect of autogenous bone graft covered with an absorbable collagen membrane alone or in combination with rhPDGF-BB in reducing peri-implant buccal bone loss**

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Thessaloniki/Greece

**Aim:** The aim of the present study was to: a) evaluate peri-implant bone loss from implant placement to uncovering; b) assess the effect of particulate autogenous bone graft covered with an absorbable collagen membrane alone or in combination with rhPDGF-BB in reducing buccal bone loss; and c) establish factors that contribute to greater bone loss.

**Material and Methods:** Twenty-two patients received 45 two-stage implants, which were randomly assigned to three groups. Fifteen implants were placed in group A (control). In group B, 0.1 cm<sup>3</sup> autograft and a barrier membrane were placed on the buccal bone of implants. In group C, the autograft under the membrane was infused with 0.1 ml of rhPDGF-BB. Clinical assessments were performed at implant placement and 3 months later. Buccal/lingual bone thickness and crestal bone height were recorded. Clinical assessment included evaluation of mucosa thickness, periodontal biotype, bone quality, and duration of implant placement.

**Results:** Surgical trauma resulted in horizontal and vertical peri-implant bone loss in the control group. Significant reduction of buccal bone loss ( $-0.07 \pm 0.44$  mm) was recorded in group B. Infusion of the autograft with rhPDGF-BB resulted in significant reduction of buccal bone loss compared to the control group ( $-0.05 \pm 0.71$  mm), but not in significant differences between the two experimental groups.

**Conclusion:** Placement of autograft alone or in combination with rhPDGF-BB and an absorbable barrier membrane resulted in significant reduction of buccal bone loss. The application of rhPDGF-BB did not improve the therapeutic outcome of the autograft covered with a barrier membrane.

## Topic: Clinical Research: Implant Therapy outcomes

**P1064****Effect of crestal or subcrestal implant placement and type of fixture/abutment connection on peri-implant marginal bone level changes**

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Thessaloniki/Greece

**Aim:** The objective of the study was to evaluate peri-implant marginal bone level changes in relation to crestal or subcrestal implant placement and type of fixture/abutment connection at 3 and 12 months after implant placement.

**Material and Methods:** The trial was divided in two parts: the first one with a 3-month follow-up period included 105 implants and the second part with a 12-month follow-up included 54 implants. The implants were randomly assigned

into four groups: in the first and second groups implants with an internal connection were placed subcrestally or crestally, respectively, and in the third and fourth groups implants with a conical seal were placed subcrestally or crestally, respectively. Standardized periapical digital radiographs were taken at the day of implantation, 3, and 12 months later.

**Results:** The peri-implant bone loss in the first part of the study was  $0.69 \pm 0.63$  mm for the first group,  $0.70 \pm 0.51$  mm for the second group,  $0.42 \pm 0.49$  mm for the third group and  $0.35 \pm 0.54$  mm for the fourth group. The marginal bone loss of the 54 implants that were followed for 12 months was  $0.95 \pm 0.45$  mm,  $0.83 \pm 0.45$  mm,  $0.52 \pm 0.25$  mm and  $0.50 \pm 0.30$  mm, respectively.

**Conclusion:** The type of fixture/abutment connection significantly affects peri-implant marginal bone resorption and the conical seal presents clinical superiority in maintaining peri-implant bone levels. Vertical implant placement does not significantly influence marginal bone height in implants with the same fixture/abutment connection.

## Topic: Clinical Research: Implant Therapy outcomes

**P1065****Peri-implant crestal bone loss: The influence of rhPDGF-BB combined with  $\beta$ -tricalcium phosphate graft on the reduction of buccal bone resorption**

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**Aim:** The aim of the present study was to evaluate dimensional peri-implant bone alterations during healing and to assess the effect of  $\beta$ -tricalcium phosphate (TCP) alone or in combination with rhPDGF-BB in the reduction of buccal bone loss.

**Material and Methods:** 45 implants placed following a two-stage protocol in 20 patients were randomly assigned to three groups. Group A received no augmentation (control group). In group B the buccal bone was grafted with  $\beta$ -TCP, while in group C,  $\beta$ -TCP granules infused with rhPDGF-BB were placed at the buccal bone.

Hard-tissue dimensions were determined by direct assessments of bone thickness and height, immediately following implant placement and at the abutment connection. Mucosal thickness at the implant site and duration of implantation were also recorded.

**Results:** The mean reduction of buccal bone thickness was  $-0.83$  mm for group A,  $-0.29$  mm for group B, and  $-0.26$  mm for group C, respectively. Statistically significant differences were detected between control and test groups. A mean facial bone height change of  $-0.85$  mm was recorded in the control group,  $-0.84$  mm for the  $\beta$ -TCP group, and 0 mm for the rhPDGF-BB group, respectively. Statistical significant differences were detected between group C and groups A and B.

**Conclusion:** Following implant placement, considerable bone resorption was recorded. Placement of  $\beta$ -TCP granules resulted in significant reduction of horizontal buccal bone loss, while addition of rhPDGF-BB resulted in significant reduction of both horizontal and vertical bone loss. Thin mucosa and extended surgical time were correlated with greater bone resorption.

Topic: Clinical research: Implants in compromised sites

## P1066

### Management of compromised esthetic implant outcomes in the anterior maxilla- a case series

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Graz/Austria

**Aim:** Tooth loss in the anterior maxilla represents an esthetic and functional challenge. Disharmonious soft tissue volume, contour and texture are often limiting the esthetic outcome. Various surgical and restorative techniques have been introduced to improve the appearance of the peri-implant complex. The purpose of this case series is to present a feasible prosthetic treatment approach to cope with soft and hard tissue deficiencies in the esthetic zone avoiding additional surgical procedures.

**Material and Methods:** Case 1 showed progressive apical displacement of facial mucosa in area 11, 21 and 22 after immediate implant placement in area 11 and 22 followed by immediate provisionalization with a cantilevered bridge. While soft tissue grafts appeared to be unsuccessful due to insufficient hard tissue support, artificial mucosa was added to the permanent restorations to re-establish optimal soft tissue appearance. The treatment plan provided a cantilevered zirconium bridge, supported by two abutments in area 11 and 21 splinted with artificial pink acrylic mucosa. Case 2 presented a facial cleft-shaped recession after reentry surgery in area 21 and 22 during provisionalization. Because of the absence of hard tissue support, soft tissue grafting procedures remained unsuccessful. To avoid additional surgical procedures artificial pink ceramic mucosa was added to the permanent restoration. Sufficient plaque control was facilitated in both cases.

**Results:** Both cases were satisfactorily rehabilitated by the use of artificial mucosa.

**Conclusion:** The presented cases demonstrate a viable prosthetic treatment approach in compromised soft tissue sites. Application of artificial mucosa can optimize the aesthetic outcome in cases of hard and soft tissue deficiencies.

Topic: Clinical research: Implants in compromised sites

## P1067

### Biomechanical analysis on ceramic abutment with platform switching design in maxillary incisor implant

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**Aim:** To examine the effects of ceramic abutment with platform switching design on stress distribution in and around maxillary incisor implant with three-dimensional (3D) finite element models.

**Material and Methods:** 3D finite element models simulating implant bearing maxillary central incisor are constructed. Three models are designed. One model has titanium abutment (Model A), one model has zirconium abutment (Model B), the other one has aluminum oxide abutment (Model C). In all models, 118N force is loaded perpendicularly to lingual surfaces of the teeth. Stress distribution patterns in and around the implants are compared.

**Results:** Maximum stress value of cortical bone and implant in order of descending is Model A, B and C. Maximum stress value of abutment in order of descending is Model C, B and A. Maximum stress values of crown and cancellous bone in all models are similar. Overall stress distribution patterns in all models under loading are similar.

**Conclusion:** Compared with implant with titanium abutment, implant with ceramic abutment generates lower stress on cortical bone and implant, higher stress on abutment. Abutment material has no effect on stress of crown and cancellous bone. Stress on abutment focuses on labial part of implant-abutment interface.

Topic: Clinical research: Implants in compromised sites

## P1068

### Rehabilitation of Palatal Defect Patient with Dental Implant Supported Prosthesis

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Istanbul/Turkey

**Aim:** To achieve an ideal esthetic and functional result in a patient with palatal defect is challenging. On the other hand, advanced surgical skills will be required even if the palatal defect was reconstructed. Only a team work within harmony will give a satisfactory result.

**Material and Methods:** 45 years old, female patient referred to our clinic for periodontal consultation. After clinical and radiographic examination, a palatal defect was observed and the teeth 13,12,11 had no enough periodontal support for an overdenture prosthesis. It has been decided to reconstruct the palatal defect and for this purpose the patient has been transferred to the Department of Plastic Surgery. 3 months after the healing of the grafted palatal site, 3 Straumann Roxolid Implants 3,3x8mm has been inserted to the maxillary anterior region.

**Results:** Implant therapy requires comprehensive preoperative planning and precise surgical execution based on a restorative-driven approach. On the other hand interdisciplinary approach provides a predictable and successful clinical results for compromised patients such as with palatal defects

**Conclusion:** Using a "team" approach to treat such cases allows the patient to receive care similar to the "medical model," in which each member of the team specializes in his/her respective area.

Topic: Clinical research: Implants in compromised sites

## P1069

### Histological and radiological examination of vertical and/or transversal augmentation of the alveolar ridge with in vitro expanded osteoblast concentrate: a clinical pilot outcome study

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**Aim:** Aim of this pre-clinical pilot outcome study was to investigate

transversal und vertical alveolar ridge augmentation by means of in vitro expanded human osteoblast concentrate combined with bone substitutes

**Material and Methods:** In this pre-clinical pilot study in 6 patients vertical and transversal defects were augmented and 41 implants placed. Biopsies were taken to produce osteoblast concentrate. For defect augmentation osteoblast concentrate was mixed with Bio-Oss® and covered with Bio-Guide® membrane. Implants were placed after 6, 8, 10, 12 and 14 months respectively. Before implantation CT scans were made for drilling templates and radiologic measurement of bone density. During implantation biopsies were taken by means of trepan drills and evaluated histologically for differences in tissue development. Implant stability was recorded.

**Results:** Histological evaluation shows that bone marrow was predominant until 10 months. No remodelling from woven to lamellar bone was detected until 14 months. In the graft material lacunas were found after 10 months. CT scans showed increasing density of the newly formed bone compared to origin bone and no signs of resorption over the study period. The initially found cortical layer dispersed after 10 months. Primary stability of implants increased from 25 Ncm after 6 months to 55 Ncm after 14 months respectively.

**Conclusion:** Osteoblast concentrate seems to be a useful tool for ridge augmentation leading to bone structures comparable to natural bone. More studies are needed to proof this new approach.

Topic: Clinical research: Implants in compromised sites

## P1070

### Maxillary sinus floor augmentation in the presence of a large maxillary sinus retention cyst: case report of a minimally invasive approach

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Lisboa/Portugal

**Aim:** The radiological assessment for maxillary sinus augmentation procedures, leads to frequent incidental findings such as maxillary sinus cysts. It is still being discussed whether they should be removed or not before the procedure. A clinical case of a large antral retention cyst is presented, leading to a successful outcome.

**Material and Methods:** Fourty year old female patient, partially edentulous in the posterior left maxilla that required sinus augmentation before implant placement, underwent computerized tomography, presenting a big large retention cyst. After an evaluation by the otorhinolaryngologist and oral surgeon specialist, it was decided to elevate the cyst without its removal. The procedure were carried out successfully without sinus membrane perforation and 4 implants were placed. 8 months later, the cyst was still present and good osseointegration of the implants was achieved.

**Results:** This presentation points out that the presence of an antral cystic lesion should not be considered a contraindication for sinus augmentation and dental implant placement.

**Conclusion:** In the maxillary sinus augmentation procedure, antral cyst removal may not be necessary if the patient does not have any symptom. In some cases it can be removed after implant osseointegration through antroscopic surgery allowing a minimally invasive procedure. Larger cystic lesions must be accessed in order to allow a successful outcome.

Topic: Clinical research: Implants in compromised sites

## P1071

### Inferior alveolar nerve (IAN) temporary paresthesia after placement of short implants.

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Valencia/Spain

#### Aim: INTRODUCTION

The inferior alveolar nerve (IAN) is a terminal branch which comes from the mandibular branch from the trigeminal nerve innervating teeth, muscles as mylohyoid or digastric, gums or lips in its mental branch. It is difficult to section it because of its width, instead of compression or laceration are more common.

**Material and Methods:** CASE REPORT: The aim of this study is to analyze recent publications about IAN injuries by a bibliographic searching in the Medline database and discuss two clinical cases of two middle-aged women of IAN paresthesia after short implants placement in an atrophic posterior mandible. Despite of during surgery there wasn't any complication, when patients came after a week to have sutures removed, they reported numbness was still present. In the postoperative radiographic study there wasn't found any mandibular canal invasion or cortical integrity loss. In both cases, proximity to the nerve was evident.

#### Results: DISCUSSION

We suppose main cause of paresthesia was due to compression of IAN because of inflammatory tissue reaction around the implant. Paresthesia disappeared spontaneously after a period between two to three months.

**Conclusion:** Even using a precise CT Scan or a predictable and secure surgical technique, in some cases where there is a close relation with IAN, a temporary paresthesia may appear. In such cases, despite of not using any treatment therapy, usually healing is obtained in few months.

Topic: Clinical research: Implants in compromised sites

## P1072

### Partially edentulous patient with periodontal, endodontal and sinonasal disease sheduled for sinus floor elevation

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Riga/Latvia

#### Aim: Introduction

Signs of maxillary sinus disease are relevant for planning bone augmentation for dental implant placement regarding to reduce postoperative complications. Postoperative sinusitis was found in patients with preexisting sinus pathology. Radiological and clinical evaluation of maxillary sinus before augmentation procedure has extreme importance. It includes height, width of residual alveolar ridge, evaluation of maxillary sinus anatomy and pathology. Preoperative assessment of patients and management for sinus floor elevation procedure is interdisciplinary team work.



**Material and Methods:** Case report

Male patient, 46years old, with history of chronic rhinosinusitis presented dental clinic for dental implant placement in posterior maxilla. He complains about nasal blockage, postnasal discharges and facial pressure for 27 weeks, nasal endoscopy shows nasal polyposis. Cone beam computed tomography (CBCT) investigation founds thickening of ethmoidal and maxillary sinus mucosa, blocked osteomeatal complex, severe endo- and periodontal disease in upper jaw.

**Results:** Discussion

Chronic rhinosinusitis is multifactorial disorder with growing incidence in European population. The detection of sinonasal and dental pathology is feasible using CBCT. Should the patients scheduled for sinus floor elevation warrant an otolaryngologist referral to control the sinonasal symptoms before augmentation procedure? Should the dental CBCT slices routinely expand to osteomeatal complex?

**Conclusion:** The use of CBCT scans in dental practice could allow improving treatment planning of surgical procedures by showing the size and location of the lesion in relation to other anatomic structures. For the patients with sinonasal and dental disease, combined therapy in collaboration between otolaryngologists and dental implant specialist is required.

## Topic: Clinical research: Implants in compromised sites

**P1073****Longitudinal Implant Stability Measurements based on Resonance Frequency Analysis (RFA) After Placement in Healed or in Regenerated Bone**

V. De Risi, V. Petrone, G.-G. Zafropoulos, G. Deli  
*Rome/Italy*

**Aim:** Primary stability is an indicator for subsequent osseointegration of dental implants, but few studies compared stability values among anatomical regions and bone types. This double-blind, prospective RCT evaluated primary and long-term stability of implants placed in healed or regenerated bone using resonance frequency analysis (RFA).

**Material and Methods:** A total of 216 screw cylinder implants were placed in 216 patients [98 in healed bone (HB), 118 in regenerated bone 6 (RB6, N = 68) or 12 (RB12, N = 50) months after tooth extraction. Extraction sockets were preserved/regenerated using dPTFE membranes. Stability was evaluated by RFA at the time of placement (E1), at 4 months (loading time, E2), and 4 months after loading (E3).

**Results:** E1: Implant location, bone quality, and experimental group significantly affected stability. E2: Implant location, diameter, length, and experimental group significantly affected stability. E3: Bone quality, implant diameter, implant length, and experimental group significantly affected stability. RB12 group ISQ values were significantly higher than all other corresponding values, and didn't change significantly over time. For the HB and RB6 groups, ISQ values were significantly higher at E2 than at E1, and weren't significantly different at E2 vs E3. Implant location, length and experimental group were associated with these differences. All p values are  $\leq 0.03$ .

**Conclusion:** Compared with HB and RB6, higher implant stability may achieved in RB12. This stability was achieved

at implant placement and maintained at least 8 months later. Variables such as implant length, diameter, and bone quality affected stability differently over time.

## Topic: Clinical research: Implants in compromised sites

**P1074****Bacterial flora in peri-implant diseases**

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**Aim:** The purpose of our study is to examine the bacterial flora of mucositis and peri-implantitis cases and also to compare this to the periodontal flora in the same subjects.

**Material and Methods:** 34 sites of peri-implant diseases have been explored on 14 patients. After clinical and radiographic examinations, the Polymerase Chain Reaction technique permit to detect 6 periodontal pathogens: *Aggregatibacter actinomycetemcomitans* (A.a.), *Porphyromonas gingivalis* (Pg.), *Tannerella forsythia* (T.f.), *Treponema denticola* (T.d.), *Fusobacterium nucleatum* ssp. (F.n.), *Prevotella intermedia* (P.i.).

**Results:** The bleeding on probing is present on all the sites of mucositis and almost all of the sites of peri-implantitis. Radiographic examination shows bone resorption only in the peri-implantitis and increase in time. A.a., T.d., F.n., P.i. are present on most of the sites but only T.f. is present on all the sites of mucositis and only T.f. and T.d. are present on all the sites of peri-implantitis. A.a. is observed in 4 sites of the 5 mucositis and is observed in 3 sites of the 29 peri-implantites. P.i. is observed in 2 sites of the 5 mucositis and in 21 sites of the 29 peri-implantitis.

**Conclusion:** There is no correlation between probing depth, bleeding on probing and gravity of the peri-implant disease. T.f. is systematically found in all cases of mucositis and peri-implantites and also in the control periodontal sites. T.d. is the 2nd pathogen the most frequently found. The bacterial flora is globally comparable to the periodontitis flora.

## Topic: Clinical research: Implants in compromised sites

**P1075****Distraction Osteogenesis for Dental Implant**

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**Aim:** The aim is 1-to introduce the distraction osteogenesis in deficient alveolar bone, types of distractors and uses of each one, theory of distraction and using the alveolar bone distractors in areas with deficient bone to create more bone for placing suitable size of dental implants

**Material and Methods:** Alveolar bone distractors were applied in five patients with resorbed (edentulous) areas of the alveolar bone then dental implants were placed in the distracted alveolar bone. cases are evaluated pre-operatively and post-operatively clinically and radio-graphically for one year.

**Results:** In the five patients, bone was formed to the required size and length and direction although the direction was a little bit lingually. The dental implants were placed in the distracted bone, where the osseointegration was perfect. patients were

followed up for a year and the rate of bone resorption was similar to that which happens around implants in non distracted bone.

**Conclusion:** In deficient bone, Alveolar bone distraction is one of the best methods to increase the size of bone specially the length of the alveolar bone, in order to be able to place dental implants of suitable length and diameter to withstand the occlusion forces and for a perfect osseointegration

Topic: Clinical research: Implants in compromised sites

## P1076

### The significance of peri-implant keratinized mucosa on peri-implant health: 1-year clinical results after the delivery of autogenous gingival grafts

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*Istanbul/Turkey*

**Aim:** Although keratinized peri-implant soft tissues are well-recognized to provide protection for the maintenance of osseointegration controversial opinions exist about the predominance of keratinized mucosa over alveolar mucosa on the long-term success of implants. The objective of this clinical trial is to analyze the effects of keratinized mucosa on peri-implant clinical condition after augmentation with autogenous gingival grafts by comparing with the results achieved by classic vestibuloplasty.

**Material and Methods:** Subjects with at least one implant presenting keratinized mucosa <1.5 mm showing signs of peri-mucositis were selected and randomly assigned to two groups. Each implant received autogenous gingival grafts (AGG group) or vestibuloplasty (VP group). Plaque Index (PI), Gingival Index (GI), probing depth (PD) and the width of attached mucosa (WAM) were measured at the buccal aspects of each implant at the baseline and 1st, 3rd, 6th and 12th months following surgery.

**Results:** PI and GI in both groups showed significant reductions at the 3rd, 6th and 12th months. No significant differences between groups were observed regarding PI and GI. VP group demonstrated significantly deeper PD values at the 6th and 12th months. Significant improvements in WAM were recorded at the 3rd, 6th and 12th months in both groups. WAM were found to be significantly greater in the AGG group at the 3rd, 6th and 12th months.

**Conclusion:** Increased width of attached mucosa around implants is associated with improved clinical condition. The application of AGG is a more predictable method for the maintenance of peri-implant health by providing a stable keratinized tissue in the vicinity of implants.

Topic: Clinical research: Implants in compromised sites

## P1077

### Preoperative assessment of the mandibular canal in implant surgery

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**Aim:** Precise imaging is essential to reduce complications after

dental implantation. In this study, we compared images taken of human cadaver heads with rotational panoramic radiography (OPG), computed tomography (CT) and cone beam computed tomography (CBCT) to the actual anatomical situation.

**Material and Methods:** Dental images were taken of ten human cadaver heads. Thereafter, they were prepared and measured. The height of the alveolar ridge to the mandibular canal was compared with the prior images taken. The deviation from the anatomical situation was calculated for each imaging technique.

**Results:** In the group of OPG images there was a median of 2.3 mm distortion ranging from -0.2 to 5.7mm in the vertical plane compared to the actual situation found during dissection. If steel balls were used during OPG, the median distortion was lowered to 0.2 mm, but the width of -1.6 to 3mm was still quite extensive. CT images showed a mean distortion of -0.2 mm and a width of -1.5 to 1.3mm. The mean distortion of the CBCT images was similar to the one found in CT, namely -0.3mm with a range from -1.5 to 0.8mm.

**Conclusion:** The results show that OPG using steel balls as calibration reference seems reliable in standard situation. In more difficult cases, modern three-dimensional techniques should be used to additionally determine available bone volume.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

## P1078

### Full-mouth rehabilitation of a patient with severe atrophic maxilla with zygoma implants: case report and review of the literature.

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*Sant Cugat Del Valles/Spain*

**Aim:** More and more patients demand esthetic and function of the masticatory system, but in some cases due to a severe bone resorption we are forced to perform advanced surgeries as zygoma implants. The aim of our poster is to illustrate, through a clinical case, one way to treat and rehabilitate a patient with severe maxillary atrophy.

**Material and Methods:** 52 years-old female patient presenting edentulous maxilla and mandible, and demanding full-mouth rehabilitation. The patient presents severe maxillary atrophy, avoiding the collocation of standard implants in the maxilla. The mandible was restored with 6 conventional implants and an hybrid prostheses. The maxilla was treated with 2 zygoma implants, 2 pterygoid implants and with a nasal floor elevation with 2 simultaneous implants. The maxilla was restored with an implant supported overdenture.

**Results:** Taking into account the anatomic structures that we have to avoid, and some contraindications to this treatment as limited interocclusal space and acute sinusitis; zygoma implants are a reliable alternative presenting high survival rates ranging from 96 to 100%, compared to that of the standard implants. With zygoma implants we can reduce treatment time compared with other alternatives as sinus floor elevation and delayed implant placement. There is no scientific evidence comparing survival rates of zygoma implants vs standard implants in regenerated areas.

**Conclusion:** For patients with severe maxillary resorption,

zygoma implants are an alternative treatment option presenting a high survival rate and providing the patient with a faster esthetic and functional solution.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

## P1079

### A Single Tooth Restoration With Implant Therapy in the Esthetic Zone

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Istanbul/Turkey

**Aim:** Achieving ideal emergence profile and restoration contours for implant-supported prostheses in the anterior esthetic zone is a prime requisite.

**Material and Methods:** 20 years old female patient referred to our clinic due to lack of a central incisor due to extraction. (tooth number 11). The extraction of the tooth performed in another clinic because of acute trauma. After clinical and radiographical examination of the patient, it has been decided to place a Straumann 3,3x12mm bone level implant and a provisional crown immediately. Implant was installed with the connection of a fixed provisional crown to a prefabricated temporary abutment. The soft tissue around the implant healed according to the contours of the provisional restoration and the emergence profile was used to duplicate the definitive restoration. Peri-implant esthetics was achieved through immediate restoration of the implant. After 2 months of the cementation of the permanent crown, a standart gingivectomy procedure performed for leveling and getting a better esthetic result.

**Results:** After one year, no significant bone resorption has been detected around the neck of the implant and the emergence profile was still satisfactory. According to us, right positioning of the implant helps to protect the buccal and interdental alveolar bone from resorption and maintain the soft tissue profile

**Conclusion:** Biotype of the gingiva is one of the most important factors to achieve a satisfactory result in the anterior region.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

## P1080

### Immediate loading and immediate implant placement in flapless procedures: a case series of 15 implants.

G. Seguro Dias, M.T. Casaca, M. Ribeiro, A.L. Silva, V. Vaz Osório  
Lisboa/Portugal

**Aim:** 15 case presentation using a new flapless approach with immediate loading after tooth extraction and implant placement is presented.

**Material and Methods:** A no flap, in non-viable upper premolars, atraumatic extractions were carried out in 15 patients (age:28-56 years). The gingival sicular fibbers were preserved, and an implant placed on the palatal side of the socket, with an insertion torque greater than 30 Ncm to allow immediate loading. All

gaps were higher than 3.5mm and no graft biomaterials were used. A good stabilization of coagulum was achieved with both suture and provisional crown. A definitive abutment, similar to the one used for the definitive crown, was used in order to allow a gingival stabilization as fast as possible. A custom provisional crown, with the same form of the extracted crown was cemented. After osteointegration a definitive crown was delivered and tissue stability was assess on year after load.

**Results:** This presentation points out that without a flap elevation and rupture of gingival fibbers that supports the "bundle" bone, and with a provisional crown in order to achieve coagulum and soft tissue stability the tissue architecture changes may be reduced and graft biomaterials may be avoided.

**Conclusion:** An immediate fixed provisionalization of implants in the premolar region, even in the presence of horizontal gaps over 2mm, can be of great benefit in reducing the soft and hard tissue recession. This technique may have even more benefits in sites of thin buccal ridges and soft tissues.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

## P1081

### Immediate implant placement in maxillary aesthetic zone: a case report

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Istanbul/Turkey

**Aim:** Improvements in dental materials provide satisfying aesthetical prosthetic results and immediate implantation became possible with the developments in implant technology. Considering the aesthetic results, the emergency profile of implants, phenotype, gingival margin and the height of dental papillae should seriously be taken into account .

**Material and Methods:** 50 years old female patient was referred to Istanbul University Periodontology Dpt. due to mobility in anterior maxillary teeth. During periodontal examination a severe periodontal tissue loss and diastema formation was observed between teeth 11, 21. It was decided to extract teeth 21, 22 and place immediate implants. Two implants were placed immediately after extraction of teeth 11,21 leaning them directly to the existing wall of the periodontal defects. The next day temporary and after 6 months the final restorations were cemented.

**Results:** During postoperative 2 year controls no change in gingival levels or periimplantary bone was observed. On the other hand, placement of implants into periodontal defects made diastema closure possible.

**Conclusion:** There are contradictory results in the literature concerning immediate implants in the aesthetic anterior zone. In the study of Chen and co., no statistically significant difference in the buccal wall resorption between flapless placement of immediate implants or placement after flap reflection was observed. Possibly, the initial thickness of buccal bone wall is of greater importance. Also gingival recession in individuals with thick gingival phenotype was less than in patients with thin phenotype. In this case, augmentation of buccal side of the implant and thick phenotype of the patient provided a satisfactory aesthetic result.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

## P1082

### CAMOUFLAGE TECHNIQUES: A METHOD TO IMPROVE THE AESTHETICS IN IMPLANT-PROSTHETIC REHABILITATION

L. De Micheli, C. Coraini, F. Buono

Milano/Italy

**Aim:** INTRODUCTION The objective of implant-prosthetic rehabilitation should be to camouflage it within the natural harmony of the oral cavity. To reach this objective, many authors illustrate the use of surgical and non surgical techniques which improve implant position, gingival characteristics and aesthetics of the teeth adjacent to the implant. We tried to standardize the use of camouflage techniques by a multidisciplinary approach through fixed timings and chronological steps

**Material and Methods:** CASE REPORT A twenty year old man with serious lesions to 2.1 was brought to our attention. The treatment plan included camouflage techniques in a sequential order. From oral conservative surgery, to the positioning of two implants, from reconstruction of hard and soft tissues to peri-implant tissue conditioning with temporary prosthetics, ending with the positioning of a final prosthetics: every step is strictly established and carried out according to the designated treatment plan.

**Results:** DISCUSSION The results obtained using the camouflage techniques are due to strict programming and completion of these specific procedures. It should be noted that, in any case, it is possible to take advantage of these techniques to correct any mistakes or unforeseeable difficulties which can arise during treatment.

**Conclusion:** The primary objective of implant-prosthetic rehabilitation is to render it invisible among the other dental elements. A well made prosthesis on a perfectly positioned surgical implant is not enough to disguise the "area" if not through the use of the multifaceted numerous camouflage techniques.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

## P1083

### Aesthetic Restoration of Gingival Papillae Adjacent to a Single Implant in a Previously Rehabilitated Cleft Palate Patient. 6-month Follow-up of a Case

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Kirikkale/Turkey

**Aim:** To demonstrate aesthetic restoration of gingival papillae adjacent to an implant in a cleft palate patient, using multi-step soft tissue grafting procedure with 6-month follow-up.

**Material and Methods:** A 19 year-old girl with unilateral palatal cleft, that had been previously rehabilitated with distraction osteogenesis, block bone grafting and a dental implant, was referred for periodontal and prosthodontic evaluation 4 months after the implant placement. In her clinical examination, head of

the implant at her left lateral incisor position was 4 mm below the adjacent cemento-enamel junction and an area of inadequate bone volume with deficient interproximal papillae and ridge soft tissues was present. The resulting defect was restored by means of multi-step procedure including a pedicle connective tissue graft, a free gingival graft, an emergence profile-contoured provisional crown and the final restoration.

**Results:** 6 month clinical follow-up of the patient demonstrated satisfactory soft tissue aesthetics and formation of the gingival papillae.

**Conclusion:** In particular cases such as a rehabilitated cleft palate, pedicle connective tissue graft and free gingival graft together with a provisional crown and the final restoration is a useful option to successfully restore the soft tissues adjacent to a dental implant.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

## P1084

### Soft tissue remodeling with a removable denture prior to implant placement with immediate loading: A case report

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<sup>1</sup>Sant Cugat Del Valles/Spain, <sup>2</sup>Barcelona/Spain

**Aim:** Soft tissue remodeling prior to implant placement is essential for aesthetic and functional rehabilitation, especially in the anterior region. The aim of this case report is to illustrate the treatment sequence of the remodeling of soft tissue with a complete removable denture prior to implant placement with immediate loading.

**Material and Methods:** A 59-year-old male patient diagnosed with generalized advanced chronic periodontitis was initially treated with phase-I periodontal therapy. Following re-evaluation a hopeless prognosis was assigned to the maxillary arch, and all maxillary teeth were extracted. Immediately after extractions, a modified complete removable denture was delivered. The modification of the denture included elimination of the buccal flanges and inclusion of ovate pontics in the anterior region. After 3 months of healing, the gingival architecture was maintained, and eight implants were subsequently placed in the maxilla.

**Results:** By manipulating the contours of the pontics, the soft tissue was remodeled and the aesthetic appearance was achieved. The patient was satisfied with the aesthetic and functional results of the oral rehabilitation.

**Conclusion:** Remodeling of soft tissue with a modified immediate complete denture after tooth extraction, in conjunction with implant placement with immediate loading, is an alternative treatment approach and provide successful aesthetic and functional results.



Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

## P1085

### Multidisciplinary orthodontic and implant therapy for the replacement of single missing tooth

E. Kwon, J. Choi

*Yangsan/Korea*

**Aim:** Introduction For the preservation of the intact teeth adjacent to missing area, implant prosthesis is the first choice of treatment option for the replacement of single missing tooth. However, if implant can not be placed in an ideal and esthetic position, the adjunctive orthodontic treatment would provide a useful tool in this regard. In the present case report, we introduce the multidisciplinary orthodontic tooth movement to facilitate an ideal and esthetic replacement of single missing tooth by implant prosthesis.

**Material and Methods:** Case report Patient's upper anterior teeth demonstrated a malalignment and crowding with the left central incisor suffering from an internal root resorption and ankylosis due to trauma from traffic accident. After orthodontic alignment and leveling of anterior teeth to create an optimal space mesio-distally for the implant placement, the crowded upper left central incisor was extracted. The edentulous area was replaced by a successful implant leading to an ideal and esthetic prosthetic restoration with pleasing smile to the patient.

**Results:** Discussion In our case, orthodontic repositioning of teeth was attempted to redistribute the space in mesio-distal direction only. Orthodontic movement scheme may have to be devised further to create optimal bony and soft tissue housing to facilitate the implant placement in an area where osseous contour is compromised in both buccolingual and vertical directions.

**Conclusion:** Conclusion With the introduction of adjunctive orthodontic tooth movement, implant could be placed in an ideal and esthetically pleasing position without damaging the intact adjacent teeth that could ensure the long-term predictability and longevity.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

## P1086

### Effect of Myrrh oil on the physical properties of three different types of suture materials 4-0 Silk, e-PTFE (Gore-Tex), and PLA/PGA (Vicryl).

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*Riyadh/Saudi Arabia*

**Aim:** Background: Myrrh oil is widely used as a mouthwash among the local Saudi population owing to its analgesic and antibacterial properties. Limited information is available about its effect of on the suture materials in the patient's oral cavity. This in-vitro study aims to test the effect of Myrrh oil on the physical properties of three different types of suture materials.

**Material and Methods:** Fifty samples of three suture materials

4-0 Silk, e-PTFE (Gore-Tex), and PLA/PGA (Vicryl); (length 8 cm) immersion medium: artificial saliva (control group) and myrrh oil (test group). were immersed in artificial saliva. After 24 hours five samples of each of the three materials were taken and their tensile stress at break was recorded using Instron Universal Testing Machine. Similarly, another five samples of were taken and placed in a glass of water with about 1 gram of myrrh oil (~65 drops) for 2 minutes and tested. This process was repeated at the end of day 2, 3, 4 and 5. Students t-test was used to detect statistical difference between the two groups.

**Results:** There was significant decrease in the mechanical strength of each of the suture material of the test group from day 1 to day 5. The control group did not show a significant difference in their mechanical properties.

**Conclusion:** Myrrh oil has a significant effect on the strength of the suture materials and this increased with the frequency of exposure to myrrh oil.

Topic: Clinical Tips and cases: Aesthetics / General implant dentistry

## P1087

### Predictable peri-implant soft tissue contouring in the esthetic zone: "Myth or reality?"

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*Geneva/Switzerland*

**Aim:** Long-term success in implant therapy is not just restricted to maintaining osseointegration or sustaining a well-fabricated prosthesis, especially when treating the esthetic zone. Frequent esthetic failures are reported, even in case of optimal initial conditions. The reasons for such failures may be associated with a lack of clinical acumen, a result of the operator's learning curve, and/or the application of an unpredictable technique.

**Material and Methods:** An early implant placement protocol was adopted and bone-level implants were placed in the partially edentulous anterior maxilla. The restorative phase was initiated after complete soft tissue healing. The peri-implant soft tissues were tactfully manipulated by the application of a pressure-re-modeling concept, during the provisional stages in the restorative phase therapy, to achieve ideal soft tissue contours for the final prosthesis.

**Results:** The technique described in this poster highlights a tested protocol, which namely avoids extensive procedures and leads to the achievement of optimal peri-implant soft tissue contours in the esthetic zone.

**Conclusion:** This technique demonstrates the predictability of a minimally invasive, prosthetically driven, staged approach for optimal peri-implant soft tissue conditioning. Well-defined guidelines comprise: case selection criteria and a specific contouring protocol to minimize esthetic shortcomings. This poster eventually aspires to motivate clinicians to adopt the described staged protocol of careful manipulation of the peri-implant soft tissues in the esthetic zone for predictably achieving long-term esthetic success