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Immediate posterior partial rehabilitations with axial and intrasinus tilted implants

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Background: In the rehabilitation of posterior maxilla, more frequently in long-term edentulism, reduced bone volume might be present because of the pneumatization of sinus cavities. Different options, such as long distal cantilevers, short implants, sinus lift, bone regeneration or implants placed in pterygoid region, tuber or zygoma could be available. Any of these techniques has surgical risks and complications. Therefore, immediate loading procedures cannot be performed if a minimum level of fixtures primary stability is not reached. Recently the use of tilted implants connected to axial fixtures supporting partial fixed rehabilitations is documented in literature with high surgical and prosthetic success rates.

Aim: To report preliminary results of a new treatment modality for the immediate fixed rehabilitation of posterior segments of maxilla with the use of one anterior axial and one posterior tilted fixture with intrasinus mesial insertion.

Methods: A total of 10 patients missing premolars and molars have been included. A piezoelectric bony window osteotomy was performed following the anterior sinus wall inclination. The window was removed and the membrane was elevated only in the anterior part. One posterior fixture (NobelSpeedy Groovy, Nobel Biocare AB, Göteborg, Sweden) with a 30° mesial inclination was inserted passing through the sinus cavity and engaging the portion of bone mesially to the anterior sinus wall. One implant was placed axially in position of first bicuspid. The sinus cavity was filled with autogenous bone surrounding completely the implant surface and the bony window was repositioned. All implants reached at least 30 N of final torque. Three hours after the surgery a screw-retained acrylic resin prosthesis was delivered and it was substituted after 6 months by final restorations made with a titanium CAD-CAM framework. Follow-ups were scheduled every 6 months and at each visit plaque and bleeding scores were assessed and radiographic evaluations were made.

Results: A total of 20 implants (4 mm diameter and length ranging between 11.5 and 25 mm) have been followed for an average of 28 months (range 20–35 months). No implants were lost. Bone loss averaged 1.0 ± 0.4 mm and 0.9 ± 0.5 for axial and tilted fixtures, respectively ($P > 0.05$), reporting 100% implant and prosthetic success rates. Plaque and bleeding scores decreased over time.

Conclusions and clinical implications: This approach allows the immediate treatment of posterior maxilla in case of reduce bone volume, representing an alternative technique to bone regeneration or short implants.

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The effect of LED photobiomodulation treatment on dental implant stabilities

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Background: Light emitting diode (LED) photomodulation has been shown to stimulate the intracellular production of (Adenosine Tri-Phosphate) ATP with the absorption of photons by the respiratory chain enzyme Cytochrome C Oxidase in a number of *in vitro*, animal and clinical studies. The increase in intracellular ATP allows for more normal cellular function in the cells that are ischemic and metabolically sub-optimal after implant osteotomy and encourages faster wound healing. Dental implants are surgically placed and the healing duration can take three to 6 months before the implant can be loaded with permanent dental restorations. Light emitting diode therapy can decrease the time required to complete the dental implant therapy.

Aim: The aim of the study was to investigate the effect of the extra-oral application of Light emitting diode treatment on implant stability.

Methods: Thirty-nine patients having had 50 dental implants (MIS, Israel) placed were examined. The patients were divided into two groups: Group 1 (25 implants) received daily Light emitting diode treatment using the OsseoPulse device (Biolux Research Ltd, Canada) after implant placement for 21 days. Group 2 (25 implants) served as the untreated controls receiving no postoperative Light emitting diode treatment after dental implant placement. The implants in both groups were tested for primer implant stability with an Osstell ISQ (Osstell AB, Sweden) device at the time of placement and 14, 30, 60 and 90 days. Independent Samples t Test was used to compare two groups.

Results: Two of the implants in control group failed to integrate and were excluded from the study. Patients treated with the Light emitting diode (Group 1) demonstrated significantly ($P < 0.05$) improved dental implant stability at day 14, day 30. No significant differences were seen at the time of implant placement, at day 60 or at day 90.

Conclusions and clinical implications: The results of this study showed that the Light emitting diode treated implants could achieve stability earlier as compared to the untreated dental

implants. The differences seen at earlier time points suggested that the Light emitting diode treated implants actually became more stable faster. These results could suggest that the use of Light emitting diode treatment to dental implants could allow for earlier loading of dental implants.

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Immediate-loading of post-extractive computer-guided implants: 1-year prospective study

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Background: Recently, computer softwares have made it possible to simulate implant placement and guide the surgery with a specific surgical template based on the simulated implant locations, thus avoiding dangerous anatomical structure and allowing fabrication of a provisional prosthesis prior to surgical placement of implants.

Aim: The aim of the study is to evaluate immediate loading technique in the treatment of full-arches with post-extractive implants inserted with the help of a computer generated guide and to assess if such a treatment is predictable in terms of implant survival, marginal bone loss (MBL), biological and technical complications.

Methods: Nine patients who needed full-arch restorations were treated. After a ConeBeam tomography and planning with computer softwares (Simplant, Materialise), consecutively bone-supported stereolithographic templates were obtained. The study of the models and the bone stereolithographic reconstructions allowed the setting up of the provisionals. Totally 67 StraumannTM implants were placed in post-extractive sites and after a couple of hours three maxillary and seven mandibular provisional complete fixed dental prosthesis were delivered. After 16 weeks 10 definitive screw-retained complete dental prosthesis were delivered.

Results: Implant indexes and radiographs were performed at prosthesis delivery and after 6 and 12 months. All implants and restorations were still in function after 1 year. No clinical problems were reported. The mean MBL was 0.3 mm (SD 0.71) after 1 year in function. All implants were assessed also by resonance frequency analysis (ISQ) after surgery and after 1 year of functional loading. The mean ΔISQ was 7 ± 4.5 units (range 5–15 ΔISQ units) for maxillary implants and 12 ± 5.8 units (range 2–20 ΔISQ units) for mandibular implants.

Conclusions and clinical implications: The short-term results indicate that this procedure is reliable. Compared to conventional techniques, this sophisticated technology requires substantially more financial investment and effort but appears to be superior on account of its potential to eliminate possible manual placement errors and to systematically achieve treatment success. However further studies are required to confirm the prosthodontic longevity and long-term success of implants placed using computer-assisted techniques.

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Extra-short implants in the treatment of severely resorbed posterior mandible

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Background: After tooth loss, alveolar bone resorption may lead to inadequate bone height for implant placement. Clinicians employ sinus floor elevation to solve such problem in the maxillary posterior region with long history of success. However, severe vertical bone resorption in the posterior mandible is challenging to treat. This has encouraged us to develop a new surgical technique to treat severely resorbed posterior mandible that employs new drilling procedure and extra-short implants to support fixed prosthesis.

Aim: Development and evaluation of a new surgical technique to rehabilitate severely resorbed posterior mandible using new drilling procedure and extra-short implants.

Methods: An extensive clinical and radiological study (BTI Scan II) was realized to establish the treatment plan. The distance from the residual alveolar crest to the inferior alveolar nerve and bone density served to define the drilling procedure. Here, a new frontal-cutting drill to precisely finish the implant bed just above the nerve was employed. This new frontal-cutting drill avoids any damage to the nerve tissue and gives the implant bed a cylindrical form that suits with the shape of the implants. The drilling procedure is separated in two phases: the first employs conventional drills till 1 mm above the inferior alveolar nerve and the second phase uses the new drill with frontal cutting surface to prepare the last 1 mm of bone. After the insertion of extra-short implants autologous bone harvested during the drilling procedure and mixed with plasma rich in growth factors (PRGF-Endoret) was employed to gain vertical bone growth around the implant.

Results: A total of 114 Extra-short implants (BTI, Biotechnology Institute) (72 implants were 6.5 mm-long) were placed in 72 patients with a median age of 57.92 (SD = 9.4) years. After 3 months, transepithelial abutments (Multi-IM, BTI, Biotechnology institute) were placed to prepare screw-retained prostheses. Surgical complications and inferior alveolar nerve function were carefully evaluated in all follow-up visits. The surgeries resulted uneventful in all patients and the radiographic analysis revealed a distance of 0.9715 ± 0.47243 mm from the centre of implant tip to the inferior alveolar nerve. Extra-short implants splitting to neighbor implants and tripod geometry is established to ensure better biomechanical behaviorof the fixed prosthesis design. Implant-based survival rate was 98.2% and only two implants placed in two patients failed during the follow-up period.

Conclusions and clinical implications: This novel surgical technique with extra-short implants constitutes an alternative to

more complicated surgical procedure in the rehabilitation of severely resorbed posterior mandible.

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Optimal implant planning in the esthetical zone

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Background: Digital diagnostics is to be preferred by Implant treatment planning in the esthetical zone. Due to prosthetic reasons so called "backward" planning from the prosthetic end situation is preferable. Nowadays different computer programs are on the market for virtual treatment planning. Due to different reasons the use of a CBCT-scan in planning implants in the esthetic zone is not always indicated. Reasons not to do so might be scattering of neighboring teeth and extra costs. In many cases in the frontal region the tooth that is to be replaced is still present at the moment of first consultation. Often this tooth is in the ideal horizontal and vertical position and provides information of the surrounding soft tissues. In a number of cases the tooth, is seated with a crown and therefore will appear on the CBCT-scan with scattering. This means loss of valuable information.

Aim: We share a method of treatment planning to save extra costs and to withdraw the most out of a CBCT-scan in the use of pre-prosthetic digital treatment planning.

Methods: At first we make an impression. With a vacuformer system we make a splint. We attach eight markers following the double scan protocol of Nobelclinician®. (Poster EAO 2010). Before a second scan of the splint is made a prosthetic tooth is placed at the restoring site taking into account the ideal gingival margins. A hole is made for the prosthetic screw. The scan data is imported in Nobelclinician®. For a dental team it is now easy to communicate the most appropriate prosthetic positioning and outcome. It is suitable for patient instructions, treatment planning and outcome. Furthermore the splint is used as a surgical guide and additionally the prosthetic crown as a temporary restoration on the implant. For the present study 15 patients are treated according this protocol. After treatment questionnaire forms were provided for immediate post-operative evaluation. A VAS (0–10) was used to assess predictability outcom, costs, possibility to communicate and user-friendliness.

Results: The different VAS scores are for predictability 9.5, costs 9.5, and possibility to communicate 8.2, user-friendliness 8.5.

Conclusions and clinical implications: It is possible to predictably estimate the final outcome situation using the "backward" planning. The team can command in a virtual environment. This technique is cost saving and very predictable. We also use the splint as a guide during surgery. This technique is suitable for the use of prosthetic planning, surgical and restorative reasons without extra costs.

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Risk factors associated with implant survival in the atrophic maxilla: clinical implications

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Background: Rehabilitation of the atrophic posterior maxilla can be simplified by placing implants with the osteotome sinus floor elevation (OSFE) technique. Simultaneous bone grafting is recommended even though peri-implant bone formation after sinus augmentation without grafting has been documented. The long-term influence of other parameters on implant survival has not been reported as extensively.

Aim: (1) To evaluate the long term survival rate of rough surfaced short implants placed with the OSFE technique in extremely atrophic maxillae. (2) To identify and quantify variables as risk factors associated with the success of implants placed in these conditions.

Methods: Between June 2000 and December 2007, 279 rough surfaced implants (Straumann AG, Basel, Switzerland) were placed by means of an OSFE in reduced maxillary residual bone height (RBH) ≤ 6 mm. All implants were evaluated in 2011 (3–10 years of function). Twenty-eight variables were selected for the statistical analysis. These variables were distributed in four categories related to: patient, site, implant, and technique. Four equations were constructed using the variables of each category. Consequently, Multivariate Cox regression analysis with a robust standard error adjusted for clustering effect was applied using Stata® 12 software. Variables with a statistically significant hazard ratio were selected from each equation and integrated into the final model.

Results: A total of 184 patients received 279 implants. One hundred and eighty patients (274 implants) were observed after 3–11 years of function, four patients (five implants) were lost to follow-up, 14 implants failed. Cumulative survival rate according to life-table analysis was 82%. Fifty per cent failed implants were placed in less than 3 mm RBH. Results from Cox regression analysis showed that residual bone height, crestal bone type, implant rotation at rehabilitation time, and presence of grafting material can be considered as risk factors with P values respectively 0.001, 0.018, 0.002, and 0.015. With every 1 mm increase in RBH, the risk of implant failure decreased by 55%. Presence of cortical crest at implantation site reduced the risk by 77%. An implant that rotated at the time of commencing the prosthetic rehabilitation had 893% more risk of subsequent failure. Finally, adding intra-sinus grafting material increased the risk of implant failure by 267%.

Conclusions and clinical implications: This study confirmed that grafting is not required to obtain long term osseointegration and to maintain function from 3 to 10 years in reduced maxillary bone. Survival of implants placed with OSFE tech-

nique in RBH $\leq$ 6 mm was optimized by: (1) increased RBH, (2) presence of crestal cortical bone, and (3) absence of grafting material.

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Narrow implants as an alternative to pre-implant bone grafts

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Background: Since few years, the importance of respecting periodontium and the increase of non-implantable cases by standard diameter implants, have led practitioners to narrow diameter implants: less than or equal to 3.5 mm. This article offers a literature review and a preliminary clinical study. The use of narrow implants is an alternative to guided bone regeneration, so it is interesting to compare the clinical results of narrow implants in native bone to standard implants in grafted bone.

Aim: The aim of our work is to conduct a retrospective study to evaluate the success rate and the survival rate of 36 narrow implants (23 pure titanium and 13 Titanium-Zirconium) placed in our department by 12 practitioners (from 0 to 7 years post-op, mean = 2 years).

Methods: Clinical data about the patient, indications and medical history, the bone site, surgery, prosthesis, occlusion, periodontal behavior and overall satisfaction were collected during classic booster sessions using panoramic and retroalveolar radiographs and periodontal probing. Inclusion criteria are good general health, absence of mucosal inflammation or pathology during surgery and sufficient oral hygiene. Exclusion criteria are smoking >10 cigarettes per day, medical history of chemotherapy or radiation therapy (head and neck), leukocyte disease, uncontrolled diabetes, excessive dental tightening, non compliance, alcohol abuse, immunosuppression or taking corticosteroids and inadequate oral hygiene. The first success criteria was the absence of mobility, infection, pain or paresthesia, peripheral radiolucency, and a marginal bone resorption $\leq$1.5 mm the first year and $\leq$0.2 mm in the following years. The second was a probing depth $\geq$4 mm at any side around an implant.

Results: The narrow diameter implants have a survival rate of 100% for the titanium–zirconium and 87.0% for pure titanium. The success rates are 76.9% of titanium–zirconium and 60.9% for pure titanium. These rates are comparable to the rates of standard implants placed in grafted bone. The use of implants in titanium–zirconium alloy seems to be biologically accepted by the periodontium and presents promising results.

Conclusions and clinical implications: The results illustrate the apprehension of practitioners to choose narrow implants of pure titanium. At patient recalling, some were unreachables and others had fracture of implant or lost of osseointegration. Also, 12 implants in the same patient were placed in an unfavorable context of multiple systemic diseases. The treatments using take into account periodontal, prosthetic and occlusal notions. The titranium–zirconium narrow implants have convincing clinical results, and therefore, it seems useless to graft beforehand when there is no aesthetic interest. Nevertheless, biocompatibility of titanium–zirconium implants should be confirmed in the coming years.

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Zygoma implants, a technique to restore function in maxillary atrophy

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Background: Severe maxillary bone atrophy due to important sinus enlargement, bone reabsorption or a combination of both, is occurring (very) frequently in our practice. The most common solutions are bone grafting and/or sinus lift, but these techniques have high morbidity with an inconstant success rate.

Aim: Working in private practice we looked for an alternative technique to bone graft. Our goal is to evaluate if zygoma implant are a good alternative.

Methods: The present paper shows the results of a study on 80 patients treated from 2005 to 2011. Out of 60 patients were fully edentulous and 20 had mono lateral endentulism. Even if with no statistical significance, it is worth highlighting that the data show 100% success rate. In four cases, we applied a two-stage procedure; in all other cases, immediate loading was practiced. In 20% of the cases, we performed an immediate post-extractive procedure.

Results: A part from light post operative complications (swelling, hematoma and light discomfort), in general the patients did not complain about any severe problems. All the patients were treated in general anaesthesia. Four patients experienced sinusitis, two as an early complication (respectively 2 and 4 months after surgery) and two of them as a late complication (6 years after surgery). All the cases were treated with medical therapy and the sinusitis was completely resolved. In one case there was a temporo-mandibular joint dysfunction after surgery, probably due to excessive mouth opening during surgery.

Conclusions and clinical implications: From our experience, we can conclude that zygoma implants are a really suitable technique in patients with severe bone reabsorption. The technique permits faster restoration with little discomfort for patients, at a comparable cost with bone graft. Reducing the risk of early sinusitis, the most important complication in our opinion, is the object of our present investigations.

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Dental implant outcome after primary implantation into double-barreled fibula bone flap–reconstructed mandible

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Background: Functional and esthetic mandibular reconstruction can be achieved in a single operation by double barreled fibula osteoseptocutaneous free flap with dental implants loaded simultaneously into the upper barrel.

Aim: The aim of this study was evaluate the quality and result of such reconstruction.

Methods: From 2005 to 2008, 15 patients received segmental mandibular defects reconstructions with double barreled fibula osteoseptocutaneous flaps and simultaneous dental implants implantations. Implants marginal bone loss, clinical mucosal changes, marginal plaque indices, bleeding on probing and pocket probe depth were evaluated at an average of 28.2 months after implants functional l loading.

Results: Fifteen patients had a total of 38 osseointegrated implants were evaluated. The mean implant marginal bone loss was 0.18 ± 0.18 mm (ranged: 0–0.6 mm) at the mesial surfaces and 0.25 ± 0.2 mm (ranged: 0–0.6 mm) at the distal surfaces. Probing pocket depth was shallower for implants protected by palatal mucosal grafts (2.56 ± 0.54 mm) than by skin flap (3.50 ± 0.90 mm) ($P < 0.05$). There was significant difference in marginal bone loss between palatal mucosal grafts (0.11 ± 0.09 mm) and skin flap (0.29 ± 0.23 mm) ($P < 0.05$). Bleeding on probing was more prominent when pocket depth exceeded 5 mm and occurred more frequently in skin flap protected than keratinized mucosa graft protected implants.

Conclusions and clinical implications: The one stage combine surgical method is a safe and reliable procedure. Not only oral function obtained also mandible contour was achived. Firmly attached gingival-like palatal mucosal grafts prevents peri-implant soft tissue inflammation and facilitates maintenance of oral hygiene.

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Bone augmentation for severely narrow ridges before tooth extraction and implant placement

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Background: Maxillary anterior teeth may present with a thin labial bony plate and apical narrow bony housing. If teeth are lost, the narrow bony ridge will cause surgical difficulty with bone augmentation horizontally and vertically. Even with socket preservation techniques after tooth extraction, the apical narrow bony housing still presents some problem for implant placement

Aim: An alternative sequence of managing bone augmentation by doing bone grafting surgery before tooth extraction.

Methods: The presentation describes an alternative sequence of managing horizontal bone augmentation for two maxillary hopeless teeth with a thin labial bony plate and apical narrow bony housing before teeth extraction. Socket preservation following teeth extraction was done. A CT scan and surgical guide preceded two implant placements.

Results: The esthetic outcome was achieved with these two simple surgical techniques. The CT images of the final result proved the viability of this alternative sequence of managing a maxillary narrow ridge situation.

Conclusions and clinical implications: By using alternative sequence of managing a maxillary narrow ridge situation, it becomes surgically easier to reach increasing bone width and implant placement.

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Correction of early implanted upper anterior teeth by distraction osteogenesis and orthodontic treatment

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Background: Management of multiple missing maxillary anterior teeth in adolescents is very challenging. For young patients, definitive treatments are not feasible due to ongoing craniofacial growth. While removable partial dentures are rarely accepted by young patients, a resin-bonded fixed partial denture is considered conservative, but it may not be suitable in situations of loss of multiple teeth. Another alternative, implant replacement, is usually contraindicated and may result in many complications, including esthetic problems related to its ankylosis consequence and potential interference with normal growth of the jaws, if placed too early in life.

Aim: This case report presents how the growth-related implant malposition was corrected.

Methods: A 22-year-old female patient suffered from facial trauma when she was 12 years old, leading to loss of three upper incisors. Ridge augmentation and three dental implants were then performed to provide a fixed prosthesis as her parent's request. Eight years later, her maxillary incisors were unaesthetic with uneven gingival contour, reverse smile line and infraocclusion. Therefore, subapical osteotomy and distraction osteogenesis in combination with full mouth fixed orthodontic treatment were utilized to reposition the implant-bone segment into a prosthetically favorable position. Then, the implant-supported crowns were renewed as well.

Results: After 2 years and 5 months, successful outcome with aesthetic gingival line, harmonious smile curve, and stable occlusion was achieved.

Conclusions and clinical implications: In conclusion, malpositioned and ankylosed implants placed in adolescence can be successfully corrected by distraction osteogenesis and orthodontic treatment after the skeletal growth is stable and complete.

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The effect of drill design on drilling characteristics when drilling bone

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Background: Twist drills are often used to prepare implant sites for the internal fixation of fractures the surgeon must be careful in terms of the heat generated and its duration. The use of a graduated series of drills to widen the site has been recommended. In contrast, this drilling procedure causes the increment duration of surgical operation and inconvenience. If the drilling procedure can be simplified, it may contribute to a improvement in the convenience of implant treatment.

Aim: In this study, we measured the drilling characteristics of drills with different designs and conventional drill to demonstrate the effects of flute geometry and tip design during drilling bone.

Methods: Drill design and flute geometry contribute to the temperature rise during drilling bone. We used four different drill design considered flute geometry and drill tip shape: Type A (conventional tri-flute drill), B (modified tri-flute drill), Type C (conventional twist drill) and D (modified twist drill). Thus, three drills with different flute geometry and tip shape vs. one control (Type A) were tested. This study used artificial bone and measured cutting speed and bone temperature. Real-time temperature changes were assessed using an infrared thermal imager.

Results: Regarding the cutting efficiency, Types C to D had significantly lower cutting time than the Type A ($P < 0.01$). Type D had the lowest cutting time, which was significantly lower than the types A to C ($P < 0.01$). The temperature elevation 0.3 mm from the test hole was significantly lower type A than types C to D ($P < 0.05$).

Conclusions and clinical implications: Within the limitations of this study, we found that drill with two flute and multi-step drill tip was effective in cutting efficiency and reducing the temperature rise when drilling bone.

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Clinical study on the efficacy of drilling procedure using the HIOSSEN 123KIT, which is designed to minimize the number of drilling steps

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Background: The drilling procedure for the fitting of an implant is dependent on the quality of the bone to which the implant will be fitted. In the case of hard bone, drilling should be started by making a small hole and then enlarging its diameter through 5–7 separate drilling procedures, in order to prevent potential tissue necrosis resulting from the heat generated by the drilling procedure. However, this drilling methodology can cause fatigue to both practitioner and patient owing to the extended procedure time, as well as making the procedure inconvenient.

Aim: We assessed the abnormality of the tissue and the clinical satisfaction with the HIOSSEN 123KIT, which was developed to minimize the drilling procedure by adopting changes in the cutting force and the design, in a clinical environment.

Methods: A questionnaire survey was conducted on 68 clinics using the 123KIT. Practitioners were asked about the number of drilling procedures required depending on the bone quality, and were asked to score their satisfaction with the product. The responses were analyzed according to the practitioner's clinical experience.

Results: Among the respondents, ten (15%) had clinical experience of <5 years (Group 1); 17 (25%) had clinical experience of 5 years or more and <10 years (Group 2); and 41 (60%) had clinical experience of 10 years or more (Group 3).. Eighty-nine percent of the respondents in group 1 answered that they had to carry out two separate drilling procedures for implants with a diameter of less than ∅4.0 on normal bone; while 75% in group 2 and 85% in group 3 responded likewise. Eighty-three percent of the respondents in group 1 answered that they had to carry out three separate drilling procedures for implants of any diameter on hard bone; while 50% in group 2 and 63% in group 3 responded likewise. On the other hand, none of the respondents in group 1 had to carry out more than three separate drilling procedures on hard bone, while 17% in group 2 and 21% in group 3 did.

Conclusions and clinical implications: More practitioners with clinical experience of <5 years expressed their satisfaction with the decrease in the number of drilling procedures required, which is the main feature and advantage of the 123kIT, answering that they were willing to use a more simplified drilling procedure in the future, compared to those with clinical experience of more than 10 years. Therefore, we conclude that this simplified drilling procedure has been proven to be safe in a clinical setting, and it is expected that the 123 KIT willenable a more convenient drilling procedure for

novice practitioners who are unfamiliar with the procedure as well as for experienced practitioners.

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"Fanwise" gingival graft in immediate implantatation in the case of loss of buccal plate

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Background: Anterior esthetic is the most challenging aspect of implant dentistry as it requires accurate implant position, enough thickness of buccal bone, and enough thickness of gingiva for optimal esthetics. Achieving this goal often requires multiple surgeries to patients. Historically, only space maintaining membranes such as Ti-reinforced, Ti-Mesh, or bone block has been recommended for severe horizontal bone defect with loss of a buccal plate. This requires morechallenging surgical techniques and discomfort of having to remove them at the second stage surgery. In addition, achievement of primary closure leads to losing vestibular depth, which requires vestibular extension with free gingival graft later.

Aim: To regain horizontal bone width, I wanted immediate implant to be placed using resorbable membrane and "fanwise" gingival graft without losing vestibular depth.

Methods: "Fanwise" gingival graft consists of round head which contains epithelium and connective tissue and "fanwise" part which is only connective tissue. "fanwise" gingival graft was harvested from palate. Anterior tooth without buccal bone was extracted and immediate implant was placed. Bonegrafts with PRP (platelet rich plasma) were used to cover buccal defect around implants. Collagen membrane was used to cover the bone graft materials. "Fanwise" part was inserted between collagen membrane of buccal side and buccal flap. round head covered the extraction socket.

Results: Good primary closure around extraction socket was achieved with the augmentation of buccal bone and soft tissue without shortening vestibule. Good esthetic outcome and stablility of buccal margin was noted after 2 years of loading.

Conclusions and clinical implications: Unique gingival harvesting technique named "Fanwise" Gingival Graft to thicken gingival biotype and seal the extraction socket while not shortening the vestibular depth was successful. This new technique is easier for operator and reduced number of surgeries by utilizing resorbable membranes and the new gingival harvesting technique is beneficial for the patient. This method yields good esthetic result in anterior maxillary zone.

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Treatment of partial edentulism with a new ceramic implant system

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Background: Zirconia ceramics have been proposed as an alternative to titanium implant material. The availability of a non-metal alternative with similar or better properties may be advantageous in some cases for prosthodontic, esthetic or biologic reasons. We have previously reported the outcome of 20 patients treated with zirconium implants. Based on the experiences made, multiple aspects of the system have been modified. Here we report the initial results of the first 25 patients treated with the new system.

Aim: To document the clinical use of a new two-part zirconia implant system for support of single-unit all-ceramic crowns and to assess its short term clinical success, safety and patient satisfaction.

Methods: In this prospective case series 39 zirconia dental implants (Zeramex® T, Dentalpoint AG, Switzerland) were placed according to a standard surgical procedure in 25 consecutive, partially edentulous, systemically healthy subjects. All subjects were non-smokers, the age ranged between 24–75 years. Three months after surgery, zirconia abutments were bonded into the implants with a dual-cured resin cement (PanaviaTM F). A full-ceramic crown was fitted. Patient satisfaction was assessed using a VAS.

Results: Implants were used to replace 1 incisor, 17 premolars and 21 molars, 20 in the lower and 19 in the upper jaw. The intraosseous implant lengths were 8 mm (seven implants), 10 mm (21 implants), and 12 mm (11 implants). Ten implants had a diameter of 5.5 mm, 28 of 4.2 mm and 1 of 3.5 mm. All implants were placed as intended and primary stability was reached in all cases. Soft tissue healing was uneventful; no adverse events and no complaints were noted. Thirty-eight of the 39 implants were stable 3 months after surgery. Twenty-five implants, in 17 patients, have been loaded so far. All patients were fully satisfied (VAS 10 mm) with the outcome at the time of crown placement. However, one abutment fractured 10 days later and has been replaced since. In addition, one implant had to be removed due to mobility 3 months after loading. The patient was without pain or discomfort and peri-implant tissues showed no signs of inflammation.

Conclusions and clinical implications: Replacement of single teeth was possible with this new full ceramic implant system. Long-term data will be necessary to document stability of the short-term outcomes. Supported by Dentalpoint AG, Switzerland

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The influence of systemic risk factors on peri-implant bone loss: a systematic review

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Background: The replacement of missing teeth with endosseous implants for the rehabilitation of edentulous or partially edentulous patients has become a standard of care in the past two decades. Indications and contraindications has been carefully balanced throught the years, and nowadays proper patient selection is a key issue in treatment planning. The influence of different systemic conditions, such as systemic diseases with/without systemic medications, genetic status and smoking habits has been widely studied. Several systematic review are present in the literature focusing on implant survival in such situations, but none aimed to longitudinally evaluate peri-implant bone level.

Aim: To systematically review the evidence of an association between the aforementioned systemic conditions and peri-implant bone loss.

Methods: MEDLINE-PubMed was searched up to January 2012, and the search was supplemented by cross-checking the reference list of selected studies and review articles, looking for additional papers reporting data concerning radiographical changes of peri-implant bone level in studies focusing on systemic diseases, genetic status and smoking habits. Case series, prospective and retrospective controlled clinical trials and randomized clinical trials with at least 1 year of follow up after loading were included. Heterogeneity and methodological study quality was assessed.

Results: The search resulted in 1763 papers, but only 16 papers fulfilled the inclusion criteria. Considerable heterogeneity in study design was found and few studies accounted for confounding variables. For most systemic diseases (excepted osteoporosis), no studies comparing patients with and without the condition in a controlled setting were found. Regarding genetic status, one study reported carriage of a functionally significant IL-1 gene complex polymorphism associated with an increased risk for peri-implant bone loss following prosthetic reconstruction, but only in heavy cigarette smokers. Regarding smoking habits, most studies found statistically significantly more peri-implant bone loss for smokers than for non-smokers.

Conclusions and clinical implications: The level of evidence indicative of absolute and relative controindications for implant therapy due to systemic diseases is low. For patients with manifest osteoporosis under an oral regime of bisphosphonates, peri-implant bone level seems to remain stable during the years. Regarding IL-1 genotype status and peri-implant bone level there is not enough evidence to support or refute an association, while an increased peri-implant bone loss was demonstred in smokers compared with non-smokers. Future researches are needed, to evidence controidications for implant therapy in patients with systemic disease.

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Implant placement after removal of a failed blade implant: a clinical case report

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Background: Prior to the development of root-form endosseous implants, most implants were blade endosseous implants. First blade implant was performed by Linkow in 1966. Blade implant's success rate is reported as 49%, 65%, 75% in 5 years, by different authors, and 50% in 10 years. Biological and mechanical complications may lead to implant failures. Biological complications include peri-implant radiolucency, bleeding on probing, increased probing depth and radiographic signs of bone loss. Adverse occlusal forces on the implant-prosthetic complex have been reported to cause mechanical failure. Unlike cylindrical implants, blade implants have been associated with a fibrous tissue interface that may not have the predictable success which observed for osteointegrated cylinder implants. Because of fibrous interface, blade implants don't have a predictable long term survival.

Aim: In this case we describe a failed blade implant extraction with preserving the residual bone. To protect the residual bone we use piezoelectric surgery to remove the blade implant.

Methods: A 50 year old woman who had a blade implant at her right maxillary molar region and fixed prosthesis came to our clinic with a chief complaint of halitosis. We identified bleeding on probing and peri-implant pocket in peri-implant examination. Bone resorption around the collar of the implant was found at the radiologic examination also. So we decided to remove the blade implant and replaced with the osteointegrated root-form implants. Even with blade implants patient had a thin crestal bone, 5 mm in thickness. In order to preserve the residual bone, piezoelectric surgery was used to detach the bone and implant. After the explantation, the defect was filled with biomaterials. Four months after grafting, new root-form implants were placed and following osteointegration, the patient was rehabilitated prosthetically.

Results: We preserved the 5 mm residual bone with this technique and piezosurgery supplied a real cooling at inner bone which we were not able to get with drills and burrs.

Conclusions and clinical implications: Today, implants still have some clinical complications such as peri-implantitis. Peri-implantitis could be managed at osteointegrated implants but because of lack of osteointegration blade

implants should be removed in this situations. At this case piezoelectric surgery helped us to protect residual bone and to avoid the risk of fracture in vestibule or palatal part of crestal bone. So we obtained enough bone for new root-form implants. At the end of the treatment patient got a healthy oral condition.

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Innovative surgical and prosthetic workflow for immediately loaded rehabilitations of edentulous mandible

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Background: This work proposal is limited to a technique that previews the accuracy of models for the inverse planning of immediate loading in edentulous mandibles; The proposal specifically focuseson the use of these models in predicting the need for surgery and evaluating inverse planning. The influence of model accuracy on surgical planning is key to the applicability of rapid prototyping model technology. A special focus was placed on implant survival and same day final prosthetic placement within a retrospective study design in a clinical setting.

Aim: Toevaluate the implant survival rate of immediately loaded implants by inverse planning based on fabricated bone models of the edentulous mandible, enabling same day final prostheses.

Methods: The clinical case series study includes 32 healthy patients (22 female, 10 male) with 128 placed implants in the edentulous mandible. The workflow of the treatment concept uses Cone-beam CT-images to fabricate bone models of the mandible using a prototyping technique. The bone model enables the manufacturing of the final prosthesis by a dental technician prior to implant placement using a surgical guide made after the placement of four replicas in the mentum region of the model, finishing the rehabilitation in the same day. The outcomes were performed using clinical interviews and clinical evaluation. The retrieved data was analyzed using descriptive statistics.

Results: Two groups were analyzed (1–3 years, 4–7 years) being the overall implant survival rate of 99.2%. All of the patients were satisfied with the esthetics, phonetics, psychological and functional aspects once the treatment and recall appointments were completed.

Conclusions and clinical implications: This study has demonstrated that a fabricated bone model is a viable tool in the surgical and prosthetic planning of implant-borne suprastructures for edentulous mandibles, and the model enables the insertion of final oral rehabilitations on the day of implant placement.

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Mirgation of a dental implant into the inferior nasal meatus

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Background: Posterior maxilla presents a usual region for implant placement. However the low density bone in this area in conjunction with the insufficient bone height results often in implant failures. Rarely, failed implants were observed to migrate in maxilla sinus and/or the nasal cavity.

Aim: It is reported a case of migration of a dental implant from the posterior maxilla region into the inferior nasal meatus through the maxillary sinus. A step by step description of the procedures that were followed in this case is presented.

Methods: A 72 years female patient enrolled in our clinic for examination complaining for rhino-sinusitis symptoms. Dental history revealed a maxillary implant supported over-denture that was restored 10 years ago and suddenly 2 years ego one of the implants in site #25 was "lost". Clinical examination revealed an oroantral fistula at the site of the "lost" implant and a panoramic X-ray showed an implant in the sinus cavity. Further more, a CBCT was taken indicating that the exact implant location was inside the inferior nasal meatus close to the nasolacrimal duct orifice. A two stage approach was decided i.e. firstly to remove the implant and secondly to restore the oroantral fistula. Under local anesthesia, a rigid nasal endoscope was inserted through the nostril in order to locate the implant and using a 90° nasal hook the implant was removed.

Results: No complications such as nasolacrimal duct stenosis, epistaxis or laceration of nasal mucosa were observed during 1 week post operatively. A second operation was made to heal the oroantral fistula 15 days later. Using a crestal incision was made and the mucosa lined the fistula as well as the granulation tissue was removed. A partial thickness flap was extended at the proximal palatal area and a pedicle connective tissue graft was dissected, rotated and secured in place using resorbable periosteal sutures. The surgical area was finally covered by palatal and buccal flaps that were repositioned using mattress sutures. Healing was uneventful. The patient was examined during next 2 months the rhino-sinusitis complains were disappeared.

Conclusions and clinical implications: Failed dental implants in posterior maxilla area may migrate in nasal-sinus cavities. Prompt and careful surgical removal of the implant may result in complete therapy of such cases.

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Case of implant displacement into the mandible during surgical procedure

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Background: A preoperative CT, a modification of the surgical technique and proper implant designed selection is mandatory especially in a patient of a history of osteoporosis or osteopenia.

Aim: It is reported a case of implant displacement under the alveolar process into the canal of inferior alveolar nerve.

Methods: A 67-year-old woman with a medical history of osteoporosis visited a private dental clinic and the surgical plan was to insert two screw-type 3.75 mm in diameter internal connection implants to restore the missing teeth #44 and #47 for a fixed prosthetic restoration. The preoperative digital intraoral radiography was used for the estimation of the available bone height for the placement of the implants. Drilling procedure was performed according to the surgical protocol recommended by the manufacturer. The bone quality was estimated by drilling to be D3 according to the classification of Misch. The drilling depth was 13 mm for #44 and 11.5 mm for #47. After final drilling the implants were inserted. During the final hand screwing of the cover screw of the implant #47, the implant subsided under the alveolar process. A periapical radiograph showed that the fixture was displaced inferiorly, approximately 3 mm below the preparing drilling depth, 1.5 mm into the canal of the inferior alveolar nerve. In the periapical radiograph there was not a concrete orientation of the roof of the mandibular canal. The patient exhibitedlip-numbness persisting the next day following implantsurgery. The CT images obtained and CT measurements verified the findings of the periapical radiography and revealed the close relation of the implant and mandibular nerve. There was a second operation for reentry and the implant was removed with a hemostat and the site was sutured.

Results: In the evaluation of the CT image, was found that the alveolar bone was composed of basal bone with very loose marrow pattern and clinical and radiographic follow-up examination was made 1 and a half year after the initial surgery and the hypoesthesia of the lip was diminished but stil persists.

Conclusions and clinical implications: A modification of the surgical technique with underpreparation of the implant bed and a proper implant design selection should be carefully estimated when installing implants in patients with loose trabecular bone. Implant design is of critical importance since implants with a wider collar and not self-cutting permit better initial stability.

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Four-year clinical follow-up of ZIR-ROC (Paris-implant zirconia implants system)

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Background: Zirconia ceramic with potential for future use as a dental implant material has been recently introduced. High-strength ceramics have become attractive as new materials for dental implants. They are considered to be inert in the body and exhibit minimal ion release compared to metallic implants. Ziconia also present good physical properties, including high flexural strength and hardness. Furthermore, its biocompatibility has been demonstrated by several authors on soft tissue and on bone, with a good osseointegration. Indeed this material seems to offer advantages over aluminium oxide for dental implants due to this higher fracture resilience and higher flexure strength. All publications indicate that zirconia ceramics are suitable materials to be used as dental implants. That is the reason why Zirconia ceramics have also been successfully used in orthopedic surgery to manufacture ball heads for total hip replacements and this is still the current main application of this biomaterial.

Aim: The aim of the present clinical study was to evaluate the 5-year success rate of Paris-Implant zirconia implants placed to support fixed dental prosthesis (FDPs).

Methods: Implants used for the study were Paris-Implant System composed of one piece zirconia implant. Seventy-two implants were placed on 55 partially edentulous patients. All FPDs were metal/ceramic. After 3–4 months of osseointegration, the FPDs were built on the implants, a time that was considered as baseline. Out of the 55 patients who received Paris-Implant System during the years 2007–2010, the zirconia implant were analysed within their biological environnement and their prosthetics rehabilitation. Clinical and radiographic examination were carried out for each implant. Success was defined as absence of complications over the entire observation period.

Results: Out of the 72 zirconia Implants, 11 were lost and 1 was broken, giving a 5-year cumulative rate of 84.4%.

Conclusions and clinical implications: This prospective study seemed to show that Paris-Implant Zirconia Implants titanium implants can achieve and maintain successful tissue integration with high predictability for at least 5 years of follow-up.

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Primary stability determination of implants inserted in sinus augmented sites: one step vs. two step procedure

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Background: The primary stability of implants is provided by the direct contact between bone and implant after insertion; it is supposed that the area of the implant body in contact with bone can influence the level of primary stability. When implants are inserted in a previously augmented sinus the contact between bone and implant is virtually present in every portion of the implant; on the other hand, if implants are inserted immediately after the sinus lift procedure, only the crestal part of the implant is in contact with bone.

Aim: The aim of this study is an evaluation of the primary stability of implants placed in the posterior region immediately after a sinus floor lift, compared with implants placed in the same area treated with a sinus floor lift 6 months before.

Methods: The study was conducted from January 2004 to December 2010 at a private practice in Bologna (Italy). Patients were eligible for the study if they needed an unilateral or bilateral sinus lift for the insertion of single or multiple implants in the maxillary posterior area. Patients with a residual bone height of at least 4 mm were treated with a one-stage procedure and inserted in group A; patients with a residual bone height <4 mm were treated with a two-stage approach and inserted in group B. In all cases sinus lift was performed with a combination of 50% autogenous bone and 50% deproteneized bovine bone mineral. Data recorded during implant insertion included: maximum insertion torque, RFA values, bone density, length and diameter of each implant. Finally, it was recorded whether an implant was lost or removed at an early stage (within 6 months from insertion surgery).

Results: Fourteen patients were included in group A, 16 patients were included in group B; 48 implants were placed in each group with a total of 96 implants inserted. The mean insertion torque was 23.77 + 12.63 Ncm in group A and 26.48 + 20.80 Ncm in group B. The mean RFA was 65.25 + 4.45 ISQ in group A and 67.92 + 10.99 ISQ in group B. None of these differences was statistically significant. Again no statistically significant differences were found between the two groups in bone density, diameter and length of implants used. All implants were successfully osteointegrated.

Conclusions and clinical implications: Within the limitations of the present study, the results show that the implants studied are able to obtain a sufficient primary stability in both different clinical situations without statistically significant differences.

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Nobelguide concept in immediately loaded rehabilitations for 72 reconstructed patients

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Background: Flapless guided implant surgery and immediate implant supported fixed bridge delivery is a minimally invasive procedure for patients. Furthermore homologous bone graft (HBG) is among the best biomaterials used in order to reconstruct atrophic jaws.

Aim: Evaluation of clinical outcomes in reconstructed patients treated with immediately loaded implant-supported prosthesis using the NobelGuideTM concept in atrophic jaws.

Methods: Seventy-two patients in need of bone reconstruction were treated with homologous bone graft (HBG) and then with computer-aided implant surgery according to the NobelGuide concept. Almost all atrophic maxillae (45) were augmented by means of HBG onlay veneers at pre-maxilla with or without bilateral sinus lift (HBG chips); two most severe atrophies were rehabilitated with Le Fort I osteotomy and HBG inlays; a cleft-lip-palate case complicated by an hypoplasic maxilla was also treated by means of HBC vestibular onlay, bilateral sinus lift, two zygoma implants and four guided implants. All cases were immediately loaded with fixed full-arch prosthesis. Forty patients underwent a bi-maxillary rehabilitation; overall implants inserted were 503 (354 Nobel Speedy Groovy and 149 Nobel MKIII Groovy). Edentulous mild atrophic mandibles were rehabilitated with guided implants placed following the All-on-Four concept. Patients with an atrophic mandible underwent extractions, alveolar socket preservation through HBG chips and guided implant surgery; in two severe atrophic mandibles a free fibula flap with a guided All-on-Four approach was performed. After implant placement follows ups were conducted at definitive fixed prosthesis and at 1-year.

Results: Utilizing minimally invasive flapless guided surgery, patients with systemic diseases could be treated. Optimal insertion torque values were obtained the average inserction Torque was 42.04 N/cm (37.3 N/cm maxilla and 50.99 N/cm mandible) at final prosthesis delivery average torque values of 39 N/cm. Complications and failures were few: only one patient suffered complete failure, in two patients to lost implants were replaced by two new implants. Overall the 1 year Implant Cumulative Survival Rate was 97.03%.

Conclusions and clinical implications: In patients with severe bone atrophy it is always problematic to perform prosthetic-driven implant rehabilitation with conventional surgery. Instead 3-D implant treatment software planning allows exploiting all previously regenerated bone. Besides, guided surgery is a flapless minimally invasive procedure which has shown to prevent bone grafts resorption. In reconstructed patients with atrophied jaws implant placement using the

Nobel Guide® technique ensures primary implant stability to apply immediate loading, with good post-surgical patient compliance and satisfaction.

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What really affects the primary stability of dental implants?

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Background: Primary implant stability has been used as an indicator for future osseointegration and whether an immediate/early loading protocol should be applied.

Aim: The purpose of this study was to assess the factors that may affect the implant stability determined by resonance frequency analysis (RFA) device.

Methods: The impact of length, diameter and implant body surface area (IBSA), use of one stage non-submerged or two stage submerged implant design, different bone quality and also different surgical procedures such as lateral wall sinus augmentation, use of bone graft and membrane due to buccal fenestration during implant surgery and the implants placed in regenerated bone have been evaluated. One hundred and ninety-seven Tapered screw-vent (TSV), 29 Swissplus (Zimmer, Carlsbad, CA) totally 226 implants with different diameter and length have been placed. The ISQ was recorded with OsstellÒ mentor device (Integration Diagnostics AB, Sweden) at implant placement and before loading.

Results: The length and the implant body surface area did not affect the primary and final stability of the implants. However; both the initial and the final implant stability was increased with the increase of the diameter of the implants ($P < 0.01$). Use of one stage non-submerged or two stage submerged implant design did not affect the stability of the implants. Bone quality affected the primary implant stability and statistical difference was found between type I /II bone and type III bone ($P < 0.01$). However no statistical difference was found between different bone types at the final stability. The lowest primary implant stability was found at implants which were placed using bone graft and membrane due to the presence of buccal fenestration during surgery ($P < 0.05$). No statistical difference was found at the final stability at different surgical procedures.

Conclusions and clinical implications: According to the results of this study it can be concluded that when the diameter of the implant increases the primer and the final stability of the implant increases. And one of the most important factors for the primary implant stability which was measured with OsstellÒ, is the quality and the quantity of the bone around the neck of the implant.

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Peri-implantitis therapy with rotating titanium-made debridement brushes – clinical results

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Background: Dental implants with improved macro- and micro-designs have a high survival rate. However, peri-implant bone loss has recently emerged to be the focus of implant therapy[1]. After bone loss caused by peri-implantitis the implant surface becomes exposed to inflammatory cells, microbes, and organic contaminants. The anti-infective surgical treatment of peri-implantitis in cases with a considerable pocket formation larger than 5 mm is based on the open flap debridement followed by implant surface decontamination[2]. To achieve a sufficient implant debridement concrements and tissue remnants have to be removed. In order to avoid recontamination after mechanical cleaning, additional dissolving of the biofilm and disinfection is necessary.

Aim: Previous *in-vitro* tests about the effects of titanium made debridement brushes compared to the treatment with curettes demonstrated an effective surface cleaning of the exposed implants with only minor impact on all tested implant structures.[3] The aim of the study is to present clinical results of the efficient debridement after use of rotating titanium made brushes in cases of severe bone loss caused by peri-implantitis.

Methods: Patients with similar peri-implantitis (pocket depth higher than 6 mm) were treated by open flap debridement followed by implant surface decontamination. Mechanical debridement was performed with curettes or rotating titanium made brushes. The time used for the procedure was measured. All patients were reviewed in a 3 months follow up.

Results: X-ray images of the patients treated by curettes or rotating titanium brushes showed no significant difference of boneloss after 3 months. The time used for a sufficient debridement with a rotating device compared to the vertical movements of a curette was significantly shorter and the debridement especially in the deeper implants threads was more efficient due to the rotationally symmetric geometry of dental implants.

Conclusions and clinical implications: The use of rotating titanium debridement brushes compared to the vertical movements of curettes in the treatment of peri-implantitis is more effective and can shorten the treatment time.

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Risk factors for the outcome of dental implants used as orthodontic anchorage in periodontal patients

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Background: Little is known about the effects of loading time and implant risk factors on the outcome of dental implants used as orthodontic anchorage in patients with periodontal disease.

Aim: The aim of this study was to undertake a retrospective analysis to fill in the gap in the current evidence.

Methods: This retrospective study included 98 implants (77 one-piece and 21 two-piece) within 36 patients. Outcome measures were implant survival and peri-implant marginal bone loss calculated at implant level. Risk factors assessed were bruxism, smoking, periodontitis, DM, stress, sites with keratinized gingiva (KG) <2 mm, type of implants, and implant with flapless surgery or immediate placement. The Fisher Exact test was used to test whether there was difference in the probability of bone loss for various loading time (<1 M, 1–3 M, >3 M) and implant risk factors. Generalized Estimating Equations was utilized to test the relations between the risk of marginal bone loss and the following six variables: age of patients, loading time, gender, immediate implant, flapless surgery, and smoking. Bayesian hierarchical modeling was used for testing the relations between marginal bone loss and two other variables: periodontitis and KG < 2 mm.

Results: Patients with mean age 47.8 (range 22–74) included 19 male and 17 female. One implant was lost which gave a survival rate of 97% at patient and 99% at implant level after up to 6 year of follow-up. Seven sites had 2- 6 mm marginal bone loss. There was no statistically significant correlation between different loading times and marginal bone loss. The lack of proper width of keratinized gingiva was associated with higher risk of bone loss ($P < 0.001$, odds ratio = 221, CI = 39.41–883.60). The relation between periodontitis and bone loss was not significant (OR = 2.83). Two-piece implants had a lower risk of bone loss than one-piece implant (OR = 0.05, CI = 0.02–0.20).

Conclusions and clinical implications: Prosthetic implants were successfully utilized as orthodontic anchorage in periodontal patients. One-piece implants and implants sites with <2 mm KG showed a higher risk of marginal bone loss. Longer follow-ups and larger samples are needed to confirm these preliminary results.

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Immediate short implant to avoid extraction of impacted maxillary canine: a case report

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Background: Impaction of maxillary canine is a quite common finding in patients taking dentistry care. There are different options reported in literature to treat impacted maxillary canines: orthodontics, surgery, combined technique and endosseous implant.

Aim: We describe a 1-year follow up of an immediate short (5 mm diameter x 6 mm lenght) implant placed after the extraction of primary canine avoiding surgical extraction of the non-symptomatic permanent canine.

Methods: Female 40 year-old went to our observation with a diagnosis of impacted maxillary canine and high-grade mobility of right primary canine (C+). Therapeutical alternatives were illustrated. The patient asked us to avoid any orthodontic treatment and the surgical extraction of impacted canine. In this way we proposed immediate implantation using a short implant after primary canine extraction. Under local anesthesia extraction of primary canine was performed and implant was placed. After 6 month, case was finalized with a ceramic-to-metal single crown.

Results: After 13 months we found limited marginal bone resorption (<0.1 mm) and peri-implant soft tissue stability. Patient was satisfied with aesthetic.

Conclusions and clinical implications: Taking into account the limitations of data from a single case and short follow-up period we can consider short implant as an alternative to extraction and longer implant placement in specific case of teeth impaction and residual bone availability.

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Toronto on six maxillary implants after bilateral sinus lift and toronto on five interforaminal immediate load implants: case of severe atrophy

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Background: Edentulous patients who wear full dentures for many years may present severe atrophy of the jaws.

Aim: Treat a severe atrophy of jaws with reduced intermaxillary vertical dimension. In the maxilla with a Bilateral sinus lift and a stereolithographic model and in the lower jaw with a protocol of immediate loading.

Methods: Upper denture wearer presented extreme alveolar resorption on the maxilla and good bone quantity on the anterior mandible. A bilateral maxillary sinus lift was performed using heterologous bone substitute (Geistlich Bio-Oss® and Bio-Gide®) on the left side, on the right side was added also platelet rich plasma (PRP). At 12 months a CT Dentascan was performed and using the rapid prototyping technique a stereolithographic model built. This model used to correctly assess 3-D bone availability on the maxilla, to plan the insertion of the six implants (Straumann SP-SLA®) and during surgery. In interforaminal area was inserted five immediate load implants (Phibo TSA®). Patient has worn the final restoration after 8 months.

Results: ISQ value at insertion, during the first year and at follow-up, showed osteointegration of the inferior implants. Bone at grafted sites demonstrated good mechanical properties during bone drilling allowing a good primary stability of six implants. Normal resorption of bone around the neck of implants was found and no failure of implant was reported. At 3 years patient was completely satisfied with the prosthetics solution.

Conclusions and clinical implications: Stereolitographic model obtained with rapid prototyping technology is an important ai to project a proper prosthetical plan that is the base of treatment success. Moreover is an important aid to the correct positioning of implants during surgery. Today we have predictable protocols of regenerative techniques associated to implants therapy to rehabilitate complex cases, but a proper planning of treatment both surgically and both prosthetically, represent the "condicio sine qua non" is not possible to reach optimal results.

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Cone-beam CT + free-hand flapless implant placement: a low-cost and fast method

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Background: Utilization of computed tomography based surgical templates or intra-operative navigation reduce the risk of damage to adjacent structures and facilitate implementation of restorative goals at high costs. However the clinical effectiveness of these systems in comparison with the conventional free-hand method is debatable and it is suggested that the latter technique could be sufficient for most clinical situations. Flapless placement of implants is an attractive technique based on the advantages that include minimally invasive surgery, less tissue handling and consequent trauma. It is also advantageous for preserving crestal bone and mucosal health surrounding dental implants.

Aim: It was aimed to reduce costs by utilising the free-hand flapless dental implant placement method after careful evaluation of cone-beam CT data acquired prior to extraction of teeth.

Methods: Two patients (65 years old woman and a 61 years old man) were planned to receive multiple dental implants for zirconium fixed prosthodontic rehabilitation after cone-beam CT evaluation. The treatment plan included full dental clearance of the remaining dentition in the first patient while no extractions were planned in the second patient. All extractions were done at the time of implant (Straumann, Basel, Switzerland) placement so that teeth could serve as fixed intra-oral reference points, improving the accuracy of implant site preparation and enabling immediate placement of implants. Flapless procedure and submucosal healing was preferred where possible. Maxillary and mandibular implants were loaded at the end of 4 and 2 months respectively. There was no need for bone grafting.

Results: The results are summarised descriptively in the table. There were no surgical complications. No implants were lost prior to loading and during the first year after loading. Patients are expected to attend for their review appointments twice a year.

	Case 1	Case 2	Total
Number of implants (maxilla/mandible)	12 (6/6)	10 (6/4)	22 (12/10)
Operation time (min)	81	70	151
Average time per implant (min)	6.75	7	6.8
Number of implants placed with a flapless procedure	8	10	18
Number of implants placed after raising flaps	4	0	4
Implant diameters in mm (number of implants)	3.3 (12)	3.3 (9) 4.1 (1)	3.3 (21) 4.1 (1)
Implant lengths in mm (number of implants)	8 (2) 10 (2) 12 (4) 14 (4)	6 (1) 8 (1) 10 (4) 12 (4)	(22)

Conclusions and clinical implications: Free-hand method is a reasonable and low cost alternative when combined with cone-beam CT evaluation, immediate and flapless implant placement methods.

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Influence of implant surface on bone stability during the healing process

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Background: The successful of implant therapy is mainly related to the primary stability, which can be improved by surface treatment of implants. However the effects of surface treatments on primary or secondary stability during the early stages of the osseointegration are still indebate. In addition, few clinical studies have shown or discussed the impact of the surface implants improvement in bone sites which will receive high masticatory loads.

Aim: This single center clinical study aimed to evaluate the insertion torque, primary and secondary stability of dental implants with different surface treatments in early stages of the osseointegration.

Methods: Nineteen patients who needed implant treatment and met admission criteria agreed to participate in the study and were consecutively enrolled. Commercially available dental implants with similar dimensions and with different surface treatment were selected: SLAactive, SLA, NanoTite and Osseotite. A total of 80 implants (20 for each surface treatment) were inserted bilaterally in the posterior mandible in partial edentulous patients. Surgical implant placement requirements consisted of a final torque of a least 30 Ncm prior to final seating and the insertion torque (IT) was recorded by digital torque device. Implant stability quotient (ISQ) was assessed by Osstell-Mentor device immediately after initial torque and weekly during 3 months. Data were analyzed by one-way ANOVA. Bonferroni test was used for comparisons between implant surface treatments in different time points and paired T test for comparisons between time points of each implant surface treatment. The significant level was set at 5%. Pearson's correlation coefficients (r) between the IT and ISQ were calculated.

Results: IT were similar for all implant surface treatments as follow: Osseotite = 46.84 ± 5.06; Nanotite = 44.47 ± 6.64; SLA = 43.82 ± 6.50 and SLAactive = 43.95 ± 6.14 ($P > 0.05$). All implant surface treatment behaved similarly until 28th day ($P > 0.05$). However, after 35 days Osseotite and SLA showed lower values of ISQ ($P < 0.001$) until 56 days. After that only Osteotite maintained lower values and it was statistically different of the others ($P < 0.05$). Significant difference was found in the ISQ values for all analyzed surfaces regarding the baseline and 91 days ($P < 0.001$). SLA and SLA active exhibited the highest values for ISQ ($P < 0.001$) while the Osseotite the lowest ones ($P < 0.001$). The correlation between ISQ and IT values at the base line and at the final period was observed for all evaluated surface, excepting to SLA surface ($P < 0.001$).

Conclusions and clinical implications: All implant surface treatments exhibited primary and secondary stability with lower values for Osseotite.

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Non-interventional study on success and survival of TiZr implants

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Background: Implant success and survival rates have been measured in controlled clinical trials, but such studies often may not reflect typical clinical practice and can be biased towards more successful outcomes. Non-interventional studies, however, can evaluate outcomes in a real world situation. Products are used as they would be in normal dental practice, but are systematically documented and the results analysed. A new implant material consisting of an alloy of titanium and zirconium (TiZr) has demonstrated greater strength than titanium Grade IV. This may help to overcome the limitations of narrow diameter implants in areas where greater mechanical strength is required.

Aim: To document the success and survival rates of TiZr implants in daily dental practice in all approved indications up to 3 years after implant placement.

Methods: This was a single-group, open-label, non-interventional multicentre study. Straumann Roxolid implants were to be used according to their intended use and each investigator's normal treatment protocol; treatment and loading protocols were defined by each clinician according to patient needs. Treatment was documented when implants of 3.3 mm diameter were placed. Patients were intended to be recalled 1, 2 and 3 years after implant placement to determine implant survival and success rates, change in mesial and distal radiographic bone level, soft tissue and complications.

Results: A total of 603 implants were placed in 359 patients between October 2008 and June 2010; 58% were placed in the maxilla and 42% in the mandible, and the majority (84%) were placed in bone quality Type II or III. Most implants (60%) were of Bone Level design, while 32.2%, 4.3% and 3.5% were Standard Plus, Standard and Tapered Effect designs, respectively. In 54.2% of cases, the clinician felt that augmentation procedures were avoided by placing a 3.3 mm diameter implant. To date, 10 implants have failed in 10 patients. Survival and success rates and bone level changes at 1 and 2 years will be presented.

Conclusions and clinical implications: Preliminary data show good results for implants of the new material in a wide variety of clinical indications, and that the results obtained in controlled trials are confirmed in daily dental practice. The clinicians felt that augmentation procedures could be avoided in over half the cases. The results indicated that these implants

may reduce the need for invasive surgical procedures and provide restorations better able to withstand loading forces.

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Implant surgery scheduling behaviour in a specialty practice setting

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Background: Patients consider many factors when selecting a surgical team to provide implant therapy. Potential reasons for not proceeding with treatment include no perceived need, prohibitive cost, fear, inconvenience and a lack of time or trust. Patients often do not schedule surgery on the day of the initial consultation, and the optimal follow-up protocol is unclear.

Aim: This retrospective study determined in a specialty private practice setting, the scheduling behavior and effectiveness of a follow-up protocol.

Methods: Thirty consecutive patients referred for a surgical implant consultation were studied. For patients that did not schedule surgery on the consultation day, we measured the days until surgery was scheduled, and the number of follow-up phone calls required to schedule the surgery appointment. Patients were followed for up to 1 year.

Results: Thirty patients (mean age = 53 years, range 20–87 years, 47% males) were included in the study. Fifty-seven per cent, 33% and 10% of patients required one, two or three implants, respectively. Thirty-five per cent were in anterior sites and 56% were in the maxilla. Although 90% of patients eventually proceeded with treatment, either implant (81.5%%) or extraction only (18.5%). Sixty per cent of patients scheduled surgery on the consultation day. Of the 40% of patients not ready to schedule surgery on the consultation day, 33% of patients were scheduled within the first 2 weeks, before the first follow-up call, 8% of patients scheduled their surgery after the first follow-up call, 33% required more than two follow-up calls and 25% never did. If the patient did not schedule treatment on the consultation day, the average number of days after the consultation until an appointment was scheduled was 56.7 days. Seveny-five per cent of patients who did not schedule treatment required wo or more implants. Interestingly, 87.5% of women and only 58% of men completed treatment. The most common reason given for not following up with treatment was reported as financial.

Conclusions and clinical implications: Men were less likely to complete treatment than women, particularly if 45 years or younger. Among patients that did not scheduled on the day of the consultation, 42% required at least one follow-up call to schedule the treatment, highlighting the importance of a follow-up system. Patients who did not schedule treatment within 1 month of the consultation often required more than one implant and the primary objection for not booking (financial) was not overcome by repeated follow-up calls.

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Immediate single implant treatment in the anterior maxilla

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Background: Bone and soft tissue around implant play an important role in the esthetic result of implant treatment in the anterior maxilla. Many authors have reported immediately implant offer several advantages, including a highly esthetic result. So the changes of buccal bone thickness and soft tissue is suggested to record.

Aim: The objective was to document bone and soft tissue dynamics following single immediate implant treatment in the anterior maxilla.

Methods: Ten implants were immediate placed with a flap procedure and GBR simultaneously in upper central incisor site. Four implants provisionally restored using cemented acrylic crowns which supported by temporary abutment. The patients took cone beam CT scan preoperative and 6–10 months after restoration was delivered. The changes of buccal bone thickness and soft tissue were measured.

Results: All patients were re-evaluated after 6–10 months. Implant survival rate was 100%. The mean thickness of buccal bone wall at the mid-root/implant level preoperative were 0.72 ± 0.22 mm and 2.0 ± 0.4 mm respectively. Papillae remained stable over time and gingival marginal line was symmetrical to homonvm teeth.

Conclusions and clinical implications: This study suggests that the esthetic and bone reconstruction outcomes of single implant treatment with CBR procedure simultaneously can be considered clinically successful.

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Eleven-year results of implants with an oxidized surface placed predominantly in soft bone and subjected to immediate occlusal loading

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Background: Numerous studies have demonstrated the feasibility and predictability of immediate implant loading or immediate implant restoration on a short-term basis.

Aim: The aim of this prospective study is to evaluate the 11-year treatment outcome of immediately loaded oxidized implants placed to support fixed prostheses in various regions of both jaws.

Methods: Thirty-eight patients received a total of 102 slightly tapered implants (Brånemark System MkIV, TiUnite®; Nobel Biocare AB, Gothenburg, Sweden) in predominantly soft bone for support of 51 fixed restorations at the day of implant placement. Thirty-two patients with 66 implants supporting 33 restorations have been followed for 11 years. The 11-year follow-up included clinical, radiographic and microbiological evaluations to assess the treatment outcome. Intrasulcular bacterial sampling was performed at implant sites (test, $n = 60$) and neighbouring teeth (control, $n = 31$). In particular, DNA probes were used to quantify four marker speciestypical for periodontal disease (*Aggregatibacter actinomycetemcomitans, Bacteroides forsythus, Porphyromonas gingivalis, Treponema denticola*). In addition, the total bacterial load (TBL) in terms of colony forming units (CFU) at implants and teeth was assessed.

Results: Three implants were removed from one patient at the 2-month follow-up due to post-operative infection in the adjacent guided bone regeneration area, although the implants were still stable. No additional implants were lost, resulting in a cumulative implant survival rate of 97.1% at 11 years (mean observation time 11.2 years, range 10.8–11.7 years). At the 11-year examination, absence of plaque and absence of bleeding on probing was reported for 60.6% and 63.6% of the sites, respectively. The mean marginal bone remodelling from implant insertion to the 11-years examination was −1.66 mm (SD 0.98, $n = 65$). The mean marginal bone remodelling from 1 to 11 years was −0.47 mm (SD 1.09, $n = 65$). The mean TBL was comparable at implant sites and at teeth. No differences were detected with regard to quantification of marker species at implant sites and teeth.

Conclusions and clinical implications: The 11-year follow-up data indicate that the applied immediate loading protocol in predominately soft bone using a slightly tapered implant design with an oxidized surface is a successful treatment alternative. Following initial bone remodelling, an annual average bone remodelling of less than −0.05 mm over 10 years indicates stable bone levels. The long-term outcome is similar to that documented for delayed loading protocols.

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Use of two different implant prototypes in the atrophied maxilla

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Background: The edentulous rehabilitation with fixed implant supported prostheses became the first choice to restore the esthetic, phonetic and masticatory functions, allied to comfort and reliability. Implant anchorage in the edentulous atrophied maxilla is often restricted due to bone resorption (a frequent condition in the posterior region of the maxilla) and reduced width of the bone crest, which together with low density bone, make it a challenge to rehabilitate. In these situations, the use of longer implants together with implant tilting could be an alternative, taking advantage of the cortical bone on the anterior wall of the sinus.

Aim: To demonstrate the technique for rehabilitation of an edentulous maxilla with limited bone availability and low density bone, using four implants in immediate function with a 25 mm length implant and 5 mm diameter implants with regular platform, both posterior implants distally tilted to overcome anatomical challenges.

Methods: A healthy female patient, age 62, attended the private practice complaining about poor retention and lack of prosthetic stability on the upper jaw, with consequent discomfort and unsatisfactory aesthetics. After clinical and radiographic examination it was decided to perform a complete rehabilitation of the maxilla using four implants in immediate function together with implant tilting. Two posterior implants were inserted and tilted distally between 30–45°: NobelSpeedyTM 4 × 25 mm (Nobel Biocare AB, Gothenburg, Sweden) in the 1st quadrant and 5 × 18 mm in the 2nd quadrant; followed by two straight anterior implants**:** NobelSpeedyTM 5 × 15 mm. An immediate implant retained acrylic-resin prosthesis was connected on the same day of surgery. Success was evaluated according to the following criteria: clinical stability, patient reported function without discomfort, absence of suppuration, infection, or radiolucent areas around the implants, and a marginal bone resorption below 2 mm.

Results: All the implants were placed with an insertion torque above 50 N/cm allowing immediate function. After 1 year, no implant was lost. No complications occurred on the implants or prosthesis and the patient reported satisfaction with function and aesthetics. The average bone resorption was 1.32 mm. The implants fulfilled all success criteria.

Conclusions and clinical implications: The use of 25 mm length implant together with a larger diameter implant with regular platform in the rehabilitation of the atrophied edentulous maxilla with low density bone did not compromise the short-term outcome. It is mandatory to perform the long term outcome evaluation of rehabilitations using longer implants through stronger study designs with larger sample sizes.

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Survival rate of imPlasa dental implant system: a retrospective study

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Background: Titanium dental implants are current gold standart for root replacement. New dental implant systems are continuosly introduced to the market. Commertially available

implants vary considerably in geometry, macro- and micro-design. The imPlasa implant system is characterized by sand blasted and acid- etched surface, internal connection and self-tapping thread. They cover the wide range of clinical indications and lead to excellent bone to implant contact properties. It is important that clinicians report their experiences with these implants when used in different situations. This paper provides an analysis of imPlasa implants short-term survival rate.

Aim: The aim of the study was to retrospectively evaluate the short-term survival rate of imPlasa implants.

Methods: A total of 637 implants were inserted in 127 patients between. May 2008 and March 2011 in private dental implant clinic. Associated factors, such as the patients characteristics, distribution of implants, survival rate, treatment type were analized.

Results: (1) Patient characteristics: 127 patients were treated with imPlasa implants. Seventy-seven patients were female and 50 patients were male. Thirty-seven patients were heavy smokers. (2) From distribution of implants, total number of patients with implants on maxilla was 92 and on mandible 82. A total of 386 implants were placed on anterior region, 251 implants on posterior region. (3) Forty-three sinus elevation was performed on 34 patients (23 open sinuslifting and 20 close sinuslifting). (4) The reason of tooth loss was periodontal problem (67%), caries (7%), tooth fracture (13%) and so on. (5) Twenty-five per cent of implants were treated by single crown, 75% of implants by bridge type. (6) Thirteen implants were failed. Ten implants were lost before final prosthesis. All other implants were osseointegrated and were loaded with cemented crowns. (7) The cumulative survival rate was 97.9%.

Conclusions and clinical implications: Conclusion and clinical implications: ImPlasa dental implant system showed excellent survival rate in this short-term retrospective study and could be a predictable implant system.

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Horizontal ridge augmentation after reconstruction of the anterior maxilla with autogenous block graft

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Background: The use of autogenous cortical block graft to augment the premaxilla is a safe and effective technique to provide adequate bone height and width when reconstructing patients with atrophic premaxilla ridge when endosteal implants are planned.

Aim: The aim of retrospective investigation was to evaluate by means of computerized tomographic scans the increase in width using autogenousblock graft from retromolar area and implant clinical success after 2-year follow-up.

Methods: Thirty five patients (15 female, 20 male) aged between 29 and 63 years-old were undergone ridge augmentation using autogenous block graft. The computed tomography scans taken before and 6 months after surgery. After 6 months the implants were placed and measured torque values. The implant survival was defined when the prosthesis had been delivered and followed for 2 years without infection, pain, or more than 2-mm periimplant bone loss. The width of bone formation was calculated using the Somaris Sienet Magic View software. The data were analyzed with paired t-test and non-parametric test ($P = 0.05$) using the Graph Pad Prism 4.0.

Results: Fifty-four sites were augmented, including 49 sites located in the anterior maxilla. The mean initial crest width measured 3.06 mm. At re-entry, the mean width of the ridge was 7.66 mm, with a calculated mean gain of horizontal bone thickness of 4.6 mm. The results showed a statically significant difference in width after 6 months ($P < 0.001$). A total of 54 fixtures were followed for more than 2 years after prosthesis delivery. In one case the maxillary sinus presented bone septa and in seven patients simultaneous implant placement with sinus floor elevation. All the implants presented connection of external hexagon, the medium size of the implants was of 13 mm of height and the torque medium of insert was of 60 Ncm. One patient developed paresthesia and three implants were lost. The 2-year survival of fixture was 95.5%.

Conclusions and clinical implications: The width obtained with the surgery was effective for the installation of the implants in the maxillary. The presented technique of ridge augmentation using autogenous block grafts with demonstrated successful horizontal ridge augmentation with high predictability.

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Is osteogenesis imperfecta absolute or relative contraendication for placement of dental implants?

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Background: Osteogenesis imperfecta (OI), also known as brittle bone disease, is an uncommon heritable disturbance in bone formation characterized by bone fragility. The disturbance in collagen formation is believed to be the result of genetic mutations in the protein responsible for the assembly and maintenance of bone and connective tissues. This results in poor bone quality and quantity that leads to bone fractures resulting from deficiencies of osteoblasts, osteoid, and periosteal bone formation. Although four major types of OI are recognized each having several subtitles. Dental implantation play an important role in aesthetic and functional gains after teeth loss.

Aim: The purpose of this study is to present implant success in patient with osteogenesis imperfecta.

Methods: In 2010 a patient that is diagnosed as osteogenesis imperfecta referred to Istanbul University, Faculty of Dentistry, Department of Oral Surgery with lots of impacted teeth. Extraction surgeries were planned as four times with bone grafting. Six months following extractions and bone grafting, dental implants were placed with any complication.

Results: The patient is under follow up approximately 2 years after implant surgery without any complications.

Conclusions and clinical implications: It is widely believed that osteogenesis imperfecta is a contrendication for dental implants. However the last reviews have shown that if adequate technique, controlled surgery were used, there would be no complication.

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The importance of CBCT in implant planning with overlooked nasopalatine duct cyst with implant: a rare case report

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Background: Nasopalatine duct cyst (NPDC) is a most common developmental, epithelial non-odontogenic cyst in the oral cavity, originates from epithelial remnants from the nasopalatine duct. The definite diagnosis should be based on clinical, radiological and above all histopathologic findings.

Aim: The purpose of this study is to present the importance of cone beam computerized tomography (CBCT) while planning implant surgery. Panoramic view isn't always as clear as to detect nasopalatine duct cyst.

Methods: In 2011 a patient referred to Istanbul University, Faculty of Dentistry, Department Of Oral Surgery with the complaint of palatal swelling and pain. Patient has dental implants in the related place so firstly he tought that the cause of the pain was implants. Panoramic view showed an unclear radiolucency, however CBCT view showed well circumscribed oval shaped radiolucency located in midline of the anterior maxilla. It was decided to enucleate the cyst under local anaesthesia. Histopathological diagnosis was NPDC.

Results: Patient's complaint of pain was gone after cyst enucleation. But dental implants' success is suspicious due to bone loss of nasopalatine duct cyst.

Conclusions and clinical implications: The incisive foreman, by conventional techniques, making the detection of a small nasoplatine duct cyst difficult. Various studies have shown that the sensitivity of detecting bony lesions, especially in the initial stages, is higher with CBCT scanning than with periapical or panoramic imaging. The main point is that CBCT has an essential role while planning implant surgery.

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Dental implant placement without grafting in a young patient with a large cyst defect

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Background: Odontogenic cysts are the most common form of cystic lesions that affect the maxillofacial region. After removal of cysts, large defects can occur in the cyst region. Due to occurence of large defects before dental implantation different grafting methods should be used to make the bone adequate for implant operation.

Aim: The purpose of this study is to show the healing of bone defects with cone beam computerized tomography (CBCT) in young patients without grafting is unexpectedly as well as grafted defects.

Methods: In 2009, a patient referred to Istanbul University, Faculty of Dentistry, Department of Oral Surgery with a swelling and pain in his right mandible. Radiological examination revealed that a well-circumscribed radiolucency in the posterior right mandible. Clinical and radiological findings look like cystic ameloblastoma, operation was made without grafting. The cyst enucleated and two molars extracted. Histopathological diagnose was radicular cyst. After 1 year, the healing of the bone was unexpectedly perfect so dental implant surgery was planned under CBCT. Two implants were placed.

Results: The patient is under follow up approximately 2 years after implant surgery without any complications.

Conclusions and clinical implications: Dental implants are the best solution, for replacement of missing teeth. In younger patients, healing of the bone is as well as grafted defects. Especially in the cases of treated jaw cysts or benign tumours, the prosthetic rehabilitation with dental implants can give very good aesthetic and functional results. However, a long term follow up is necessary because of complications such as cyst recurrences or implant failure.

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Evaluation of peri-implant bone stability around sloped implants in sloped ridges

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Background: The applications of osseointegration and dental implant therapy have developed over the last 30 years. Today we can provide predictable and reliable treatment results when replacing missing teeth with dental implants. However, how well the implant adapts to the profile of the alveolar

ridge, is an area that has been overlooked. With today's implant design, an optimal bone/implant relation is only possible when the peri-implant bone is at the same level around the implant neck.

Aim: The aim of the study is to clinically and radiographically evaluate the tissue maintenance when placing OsseoSpeed$_{TM}$ Profile implants in sloped ridges.

Methods: In our single-center proposal prospective study, we included five non-smoking patients aged from 18 to 75. The mean age of patients was 62 years (range 58–64 years). The sex distribution was: two women, three men. The bone height difference at the recipient sites (mesio-distal, bucco-palatine or palato-vestibular) was 2–4 mm and the history of edentulism was at least 3 months**.** OsseoSpeedTM Profile implants (Astra Tech AB, Mölndal, Sweden) in diameters 4.5, 5.0 and 5.0 S with lengths 9–15 mm will be used. A 1 or 2-stages surgical protocol will be utilized. Loading of the implants will take place 4 month after implant placement. In addition, Clinical data will becollected for pocket depth, gingival index and plaque index at 6 month, 1, 2 and 3 years after loading. Intra-oral radiographs will be taken for the mesio-distal sloped alveolar crest: at implant placement and at 6 month, 1, 2, 3 years after loading. A cone beam will be taken for the bucco-palatine or palato-vestibular sloped alveolar crest at 1, 3 year after loading.

Results: A total of 10 implants were placed in the study, and no implants have been lost after 4 months. The results of the intraoral radiographic measurements in the mesio distal sloped ridge show after 2 month, that the mean of marginal bone level change was −0.4 mm (SD 0.8). The results of the cone beam radiographic measurements in thebucco-palatine or palato-vestibular sloped ridge show after 2 month, that the mean of marginal bone level change was −0.3 mm (SD 0.7). Other radiographic and clinical measurements will be taken withinthe next months to estimate the peri-implant bone stability around sloped implants and to evaluate some clinical data (pocket depth, gingival index and plaque index). The patients will be followed for a total of 3 years.

Conclusions and clinical implications: OsseoSpeed TX Profile implant, with a sloping marginal outline, is developed to preserve the marginal bone, the soft tissue and to optimize the implantation in sloped ridges.

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Immediate implant placement in areas of esthetic priority. A 10-year follow-up study

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Background: Immediate implant placement is characterized by several advantages. However, specific challenges such as compromised primary implant stability, the need for bone augmentation and predictability of the esthetic outcomes have been addressed. Previous studies focusing on immediate implant placement has involved a short follow-up period and long-term studies are sparse.

Aim: To evaluate the 10-year clinical and radiographic outcomes after immediate implant placement using a standard, cylindrical, screw-shaped transmucosal implant (SLA titanium, n = 12, Straumann, Switzerland) or a tapered transmucosal implant (SLA titanium, n = 12, Straumann, Switzerland) in extraction sockets in areas of aesthetic priority in a randomized-controlled clinical trial.

Methods: A total of 24 implants were placed in 24 patients. Following minor flap elevation and careful tooth luxation, the implant was installed after randomization. When the periimplant bone defect was >1 mm horizontally or vertically, guided bone regeneration was performed simultaneously (Bio-Oss and Bio-Gide, Geistlich Pharma, Switzerland). After a 3-month transmucosal healing period, the final implant crown was placed. The outcome measures included implant crown survival, implant survival, probing depth, bleeding on probing, peri-implant marginal bone level, biological complications, and technical/mechanical complications.

Results: Implant crown survival and implant survival were 100%. The peri-implant tissues were generally clinically healthy with probing depths <4 mm and maintained periimplant marginal bone level. However, peri-implantitis characterized by bleeding on probing as well as progressive probing depth and peri-implant marginal bone loss developed around two implants. Technical/mechanical complications included porcelain fracture (two implants) and abutment screw loosening (five implants). No significant differences were observed between the two implant types used.

Conclusions and clinical implications: Immediate implant placement in areas of esthetic priority is characterized high survival rates and in most cases healthy periimplant tissues.

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The rehabilitation of perforated soft tissue using buccal fat pad

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Background: A buccal fat pad (BFP) is an autogenous graft material, that has been widely used as an alternative method for the reconstruction of small to medium sized intraoral defects in oral and maxillofacial surgery including oroantral fistula. It may be used to manage perforated membrane for its excellent physical and biological properties.

Aim: The main purpose of this case report was to introduce the soft tissue defect management using pedicled BFP grafts.

Methods: This case report estimates the prognosis of the patients who visited periodotal dentistry in Chosun University

Dental Hosipital for soft tissue defect management using PBFP graft techinque.

Results: The soft tissue which has been treated had no special side-effect and it has been maintained stably so far.

Conclusions and clinical implications: The PBFP technique is simple and easy to handle and useful technique for management of soft tissue defect.

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The influence of crestal bone loss and bone graft replacement on the stress distribution around dental implants: a finite element analysis

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Background: The prosthesis supported by osseointegrated implants has become a basic part of restorative therapy for both completely and partially edentulous patients. Various studies have shown that the stability of implant is related to the biomechanical properties of the bone surrounding. Time-dependent marginal bone loss around implants is still unavoidable and could jeopardize implant stability and the supported prosthesis. Because the finite element method is an effective analysis tool, it has been used in a variety of biomechanical studies regarding dental implantation.

Aim: The aim of this study was to investigate the biomechanical effects of grafts and stres distribution in the bone surrounding an implant placed in mandibula premolar region based on the finite element method.

Methods: A three-dimensional finite element model of a mandibula premolar section of bone was used in this study. The standard threaded implant, anatomy of the crestal cortical bone and cancellous bone with the vestibule bone defects around dental implant neck and augmentated bone with kinds of grafts were represented in the three-dimensional finite element models. A dental implant of 4.1 mm diameter and 10 mm length and for the defects around implant neck depth of 2 mm, 4 mm and 6 mm were chosen. Axially 300 N and laterally 300 N of forces were considered and the stresses developed in the supporting structures were analyzed.

Results: According to our resuls the stress was highest in the cortical bone, lower in the grafted bone, and lowest in the cancellous bone which is a parallel outcome with the literature. Stresses produced with off-axial loads were higher in the cortical and grafted bones and lower in the cancellous bone compared with axial loads.

Conclusions and clinical implications: Findings in our study suggest that the type of loading affects the load distribution more than the variations in bone, and native bone is the primary supporting structure.

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Immediate placement of conical connection implant and immediate provisionalizzation in anterior area: a prospective clinical study

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Background: The immediate implant placement and provisionalizzation is a viable treatment, howewer, the esthetic outcome of this procedure depends by several factors such as the type of the implant connection.

Aim: This is a 18 months prospective study to assess the treatment outcome after immediate placement of a conical connection implant and provisionalizzation of single unit implant supported restoration in anterior zone in terms of implant success rates and peri-implant tissue response.

Methods: Patients with a thick gingival biotype and intact buccal bone wall upon extraction of a single tooth in the anterior zone were consecutively treated. Thirty-two patients with 32 single-tooth implants (NobelActive – Nobel Biocare Gothenburg, Sweden) were treated. The treatment involved tooth extraction, flapless implant placement, placement of a screwed provisional crown in the same visit. The definitive crown was placed after a mean period of 6 months. Clinical and radiographical parameters were evaluated at presurgical examination (T0), immediately after immediate implant placement and provisionalization (T1), 1 year after implant surgery (T2), 18 month after implant surgery (T3). Outcome measures included implant survival, definitive implant crown survival, probing depth, bleeding on probing, peri-implant marginal bone level, peri-implant tissue level, Pink Esthetic Score (PES), biological and technical complications. Data were analyzed using t tests and repeated-measures analysis of variance at the significance level of $\alpha = 0.05$.

Results: After a mean follow-up time of 18 months, all implants remained in function. The implant survival and the definitive implant crown survival were 100%. The mean probing depth was 2.7 mm (±0.4) at implant level and 86% of the implants were characterized by no bleeding on probing. At T3, the mean marginal bone level was 0.64 mm (±0.12). At T3, the mean mesial and distal papilla level changes were 0.78 mm (±0.16) and the mean facial gingival level change was 0.62 mm (±0.13). The mean PES was 10.6 (±1.4). Screw loosening of the provisional restorations occurred in two cases.

Conclusions and clinical implications: Immediate placement of implants with conical connection and immediate provisionalizzation in anterior area were characterized by high implant success rates and favorable peri-implant tissue responses.

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A retrospective study on local factors affecting the survival rate of dental implants

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Background: Various dental implant systems have been developed and used worldwide. However, there are limited data with regard to long-term result of implant therapy according to different condition. A study of the large sample size is needed to reflect this clinical situation.

Aim: The aim of this retrospective study is to analyze the relationship between local factors and survival rate of dental implant which had been installed and restored in dental center of Seoul Veterans Hospital for past 10 years. And when the relationship is found out, it will be useful to predict the prognosis of dental implants.

Methods: Patients received root-shaped screw-type dental implants from January 2000 to December 2009. Six kinds of commercial implants were inserted as follows: Paragon, Camlog, Biohorizon, Astra, Replace and GS (Korean domestic product). In all, 6385 implants were placed in 3755 patients (3120 male, 635 female). Eighty-three percent of them were men. Age distribution was from 18 to 88 years, and a mean age was 65.0 ± 10.58 years. A mean follow-up period was 45.7 ± 12.48 months. The following data were collected from the dental records and radiographs: patient's age, gender, implant type and surface, length, diameter, location of implant placement, bone quality, and prosthesis type. The correlations between these data and survival rate were analyzed. Statistical analysis was performed with the use of Kaplan–Meier analysis, Chi-square test, and odds ratio.

Results: (1) One hundred and eight implants failed, and the cumulative survival rate was 96.33%. Twenty-two out of 108 failed implants were early failure, and 86 failed implants were late one. (2) There were significant differences in age, implant type and surface, length, location, and prosthesis type ($P < 0.05$). (3) No significant differences were found in relation to the following factors: in gender, diameter, and bone quality ($P > 0.05$). (4) There were low survival rates in age older than 79 (66.67%), female (93.61%), Paragon®TSV (93.09%), narrow implant less than 3.75 mm (92.39%), short implant less than 10 mm (95.11%), maxillay posterior teeth (93.73%), single implant (93.81%), and type III bone (94.45%).

Conclusions and clinical implications: As implant survival rate is influenced by various factors, it is difficult to analyze a cause of failure objectively and consecutively. The following inference could be drawn: there were complicated interactions between local factors in clinical practice. The present study reported that local factors such as age, implant type and surface, length, location, and prosthesis type had an impact on the long-term survival of dental implants.

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The analysis of osseointegrated implant survival in regenerated bone

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Background: Insufficient supporting bone can restrict adequate placement of implants. Guided bone regeneration (GBR) is highly successful technique which has become a significant component of clinical implant practice for creating adequate bone volume.

Aim: The aim of the study is to compare the cumulative survival rate (CSR) of implants placed in regenerated bone by GBR technique with that of implants placed in native bone and to evaluate associated factors such as smoking habit, implant surface, implant location, and surgical approach.

Methods: This retrospective study included patients with implant placed in native bone or in regenerated bone by GBR technique. A total of 456 implants were placed in 244 patients. Implants were classified into native bone group (control) and regenerated bone group (test). A total of 323 implants in control group were entirely surrounded by native bone. One hundred and thity-three implants in test group were divided into subgroups according to surgical approach. One hundred and nine Implants were inserted simultaneously with GBR for the treatment of osseous defects including dehiscence, fenestration and infrabony defects (simultaneous approach). Twenty-four implants were placed in sites previously regenerated with combination of a barrier and bone graft material (staged approach). A mean of 7 months (range 4–9 months) were allowed for wound healing after GBR procedure for staged implant placement. CSR was calculated using life-table analysis and comparison was carried out using the Kaplan–Meier survival function analysis and χ^2-test.

Results: Nine of 323 implants in control group failed and 2 of 133 implants in test group failed. Five-year CSR of implants in control group and in test group were 97.0% and 95.5%, respectively ($P > 0.05$). Five-year CSR between two groups regarding smoking habit (smoking vs. non-smoking), implant surface (SLA (Sandblasted, large-grit, acid-etched) surface vs. anodized surface) and location (maxilla vs. mandible) showed no significant differences ($P > 0.05$). Surgical approach (staged approach vs. simultaneous approach) had an influence on survival of implants ($P < 0.05$). Smoking habit could affect implant failure in both group ($P < 0.05$).

Conclusions and clinical implications: Implants placed in regenerated bone by GBR technique showed similar results when

compared to implants placed in native bone. Therefore, placement of implants with GBR technique can be considered as an effective and reliable treatment modality. Further studies of associated risk factors for the implant success in regenerated bone are necessary. Also, long-term stability of implants placed in regenerated bone under function has to be investigated.

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An analysis of bony window repositioning without using a barrier membrane in a lateral approach for maxillary sinus bone grafts

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Background: In lateral window approaches for maxillary sinus bone grafts, there has been considerable controversy about the placement of barrier membranes over the osteotomy and graft sites. In particular, when there is no damage to the Schneiderian membrane, clinicians should decide whether to use a barrier membrane by considering both the benefits and costs.

Aim: This article presents clinical and radiologic findings to demonstrate that repositioning of a detached bony window may lead to satisfactory bone healing without use of a barrier membrane in lateral approaches for maxillary sinus bone grafts.

Methods: Twenty-three consecutive patients were treated using the same surgical procedure. After a complete 360° osteotomy on the lateral maxillary wall, a bony window was outfractured and separated from the Schneiderian membrane by gentle elevating action. Confirming no perforation of the Schneiderian membrane, the grafting procedure was carried out and the bony window was repositioned over the grafted material without using any rigid fixation or barrier membrane. Clinical and radiologic examination was performed at postoperative 6 months re-entry. The relationships between the pattern of gap bone healing, number of implants, time of implant placement, and thickness of lateral sinus wall were analyzed. Fisher exact test and Spearman nonparametric correlation coefficient were employed for statistical evaluation.

Results: All 23 patients went on to uneventful healing with no complications associated with the bone graft. Overall external cortical healing and bone regeneration on the gap between the repositioned window and the lateral wall of the maxillary sinus were satisfactory without evidences of epithelial invagination. With respect to number of implants or time of implant placement, no significant differences in the pattern of gap bone healing were found. As lateral sinus wall was thinner, pattern of gap bone healing was better ($P < 0.05$). To date, no implant failure was found.

Conclusions and clinical implications: This study indicates that a detached bony window that is just repositioned on grafted material might function as a barrier membrane in the lateral approach for maxillary sinus bone grafts. Further radiologic and histomorphometric investigations, including an assessment of implant survival rates, are necessary to apply this technique to routine practice.

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Success rate and usefulness of a variety of OSSTEM implant systems for immediate loading

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Background: The technique of immediate placement and immediate loading after extraction has a number of advantages, e.g., shortened treatment period, preservation of remaining alveolar bone, and soft tissue and faster recovery of functionality and aesthetics. Moreover, a number of patients today wish to have meals or continue with their social life immediately after operation.

Aim: A number of clinical studies show that successful treatment means having immediate loading after alveolar bone and implant are stabilized to a degree. Note, however, that usage is limited since there is no appropriate clinical guideline.

Methods: The success rate of immediate loading and Immediate Insertion after extraction was examined using the radiographs and medical records of 268 patients (122 females and 146 males) who underwent implant operation at SM Dental Hospital from December 2006 to April 2010. The age of patients varied from 16 to 73, with 41.8 on the average. In a total of 763 implants, 256 were inserted in the traditional 1- or 2-stage surgical procedure. A total of 256 were placed using the immediate loading technique, 85, using the immediate insertion technique, and 166, using the immediate insertion and loading technique. Among them, 195 OSSTEM implants were placed using the immediate loading technique, 40, using the immediate insertion technique, and 106, using the immediate insertion and loading technique.

Results: Total Success Rate: 737 out of 763 succeeded; 96.6%. Success Rate of Control Group: 245 out of 256 succeeded; 95.7%. Success Rate for Immediate Loading: 250 out of 256 succeeded; 97.6%. Success Rate for Immediate Insertion: 83 out of 85 succeeded; 97.6%. Success Rate for Immediate Insertion + Immediate Loading: 159 out of 166 succeeded; 95.8%. Success Rate of Other Implants: 287 out of 297 succeeded; 96.6%. Success Rate of OSSTEM Implant: 450 out of 466 succeeded; 96.6%. Success Rate of OSSTEM Implant for Immediate Loading: 191 out of 195 succeeded; 97.9%. Success Rate of OSSTEM Implant for Immediate Insertion: 38 out of 40 succeeded; 95.0%. Success Rate of OSSTEM Implant for Immediate Insertion + Immediate Loading: 100 out of 106 succeeded; 94.3%.

Conclusions and clinical implications: In accordance with the clinical guidelines of this hospital, implants were placed in a number of partially and completely edentulous patients, load was applied immediately within a week, and prosthesis was mounted within 3~8 months. In these cases of immediate loading, OSSTEM Implant exhibited a high success rate comparable to that of other implants.

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Internal fixation and stabilization of a resorbable barrier membrane to repair a large perforation of the sinus membrane

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Background: Though the sinus elevation procedure is relatively safe, there are some potential problems related to this procedure. The most prevalent intraoperative complication is perforation of sinus membrane.

Aim: A resorbable barrier membrane is diversely applied for repairing perforated sinus membrane. In cases of a large perforation, it is difficult for clinicians to ascertain whether the resorbable membrane remains in its original position and continues to protect and isolate the graft material during sinus grafting procedure. In this technique, from external to "internal", changing the routine concept of stabilizing a resorbable membrane was tried.

Methods: After separating a lateral bony window by outfracture or "off-the-wall" osteotomy and elevating the sinus membrane, a large perforation is identified. A semirigid resorbable collagen membrane is asymmetrically designed so that the longer portion can be placed and folded into the inner sinus cavity. By using a titanium screw, the collagen membrane is internally fixed and stabilized on the medial or palatal surface of the sinus cavity, thus thoroughly covering the perforated area. The graft material is hydrated with saline and gently packed into the sinus until it fills the entire cavity. The collagen membrane extends beyond the upper boundaries of the lateral window osteotomy to confirm complete sealing of graft material. Dental implants are placed, bone graft is supplemented, and the detached lateral bony window is repositioned. No additional external fixation is indicated.

Results: Loss of graft material into the sinus cavity and subsequent sinus complications could be definitely prevented since a resorbable membrane is placed against perforated area, and internally fixed and stabilized with titanium screws.

Conclusions and clinical implications: This technique may offer superior protection and isolation of the graft material during sinus bone grafting procedures especially when a large perforation has occurred. Further investigations assessing the implant survival and histomorphometric analysis through long-term follow-up are necessary to validate this technique.

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Insertion torque sensitivity of TSIV SA fixture in artificial bone model

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Background: Generally, if bone quality is high, i.e., D1, a large diameter is selected for the final drill; if bone qualityis low, i. e., D4, a small diameter is selected for the final drill. Implant manufacturers provide guidance on the drilling sequences to suit the fixtures of the relevant companies for each bone quality. Note, however, that incorrect bone substance determination and drilling sequence selection may generate excessive torque upon fixture insertion; otherwise, the insertion torque may be too low, and the desired initial stabilitymay not be secured.

Aim: This study selected three types of implant fixtures used clinically and compared insertion torque sensitivity according to bone qualitydetermination. Insertion torque sensitivity was analyzed by comparing changes in the insertion torque while inserting fixtures into artificial bone according to the drilling sequence of correct bone quality determination and drilling sequence of incorrect bone quality determination.

Methods: (1) Test Group (Implant fixtures) Group 1: TSIV SA Fixture (Ø4.0 × 10 mm, Ø5.0 × 10 mm) Group 2: A Company Fixture (Ø4.0 × 10 mm, Ø5.0 × 10 mm) Group 3: B Company Fixture (Ø4.0 × 10 mm, Ø5.0 × 10 mm). (2) Test Condition Test 1: Normal bone drilling sequence in normal bone Test 2: Soft bone drilling sequence in normal bone Test 3: Soft bone drilling sequence in soft bone Test 4: D4 bone drilling sequence in soft bone Test 5: Soft bone drilling sequence in D4 bone Test 6: D4 bone drilling sequence in D4 bone.

Results: When the techniques were observed in implanting fixtures in normal bone using the normal bone drilling sequence, the maximum insertion torque was 25–33 Ncm for Group 1, the highest for Group 2 at 46–55 Ncm, and the lowest for Group 3 at 20–21 Ncm. When the techniques were not observed and fixtures were implanted using the soft bone drilling sequence, however, most showed high insertion torque at over 60 Ncm. Compared to normal bone, there was a significantly smaller difference in insertion torque for soft bone when the techniques were observed and when they were not observed. The smallest difference between insertion torques when the techniques were observed and when they were not observed was noted in D4 bone.

Conclusions and clinical implications: Within the limitations of this study, the insertion torque sensitivity of TSIV SA fixture is concluded to be lower than other groups of fixture.

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Influence of implant length and insertion depth on stress analysis: a finite element study

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Background: The case of implant fracture accompanying Bone Loss is the same as the location of the fracture where the crestalbone level is lost. The bone level around implant is an important factor for stability, and clinical guide is needed as to the implanting method to maintain such stability.

Aim: The effect of the implant's placing depth and the height of the remaining alveolar bone were verified through 3-D Finite Element Analysis. The purpose is to validate the biomechanical basis for setting the initial placing depth of the implant.

Methods: Design of Finite Element Model: The placing depth of the implant and the shape of the remaining bone were simplified to reproduce five types of analysis models. The effects of the alveolar bone and the implant with respect to the biting force were compared through the stress value from each model.

Results: In case an implant was deeply placed, (1) the stress of the bone around the implant was reduced, and; (2) the strength of the implant itself was maintained. (compared with the case wherein bone loss occurred).

Conclusions and clinical implications: The method of implanting as deep as possible is believed to be able to promote long-term stability by dispersing the biting force applied to the alveolar bone and the implant.

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Accuracy of computer-guided implant surgery using fixed radiographic markers

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Background: For computer guided implant surgery, CT scanning of intraoral anatomic structure with radiographic markers is required for image merging or fixation of the model in the milling machine. Traditional removable radiographic guides have disadvantages including image distortion by metallic prosthesis, misfit of the guide, requirement of additional visits, and longer preparation period. In this study, fixed radiographic marker was used to simplify preparation process of the guided implant surgery and improve accuracy.

Aim: This study aimed to evaluate accuracy of the fixed marker in the guided implant surgery.

Methods: Patient models (model 1: single tooth missing case, model 2: bilateral posterior missing case, model 3: fully edentulous case) were prepared from actual patient impressions. Fifteen cylindrical titanium rods (3 mm in diameter, 8 mm in length) were embedded and covered with clear utility wax. Fixed markers made of radio-opaque resin were bonded at three points. To improve precision of CT image merging process, three fixed radiographic markers were spread over the entire arch. Surgery models were made from impressions of these three patient models. CT scan of patient models and surgery models were taken and images were merged based on the fixed radiographic markers. During virtual treatment planning, titanium rods were determined as implant sites. From the merged CT scan image, surgical templates were fabricated with 5-axis milling machine. Fifteen implant sites were drilled according to the surgical guide. Drilled surgery models were CT-scanned and this image was merged with patient model image. Vectors of titanium cylinder and drilled hole were calculated. Deviations from original implant site were measured with computer software in horizontal, vertical, and angular directions.

Results: Average deviation at the top of metal rods: 0.147 mm (SD: 0.0338) Average deviation at the bottom metal rods: 0.173 mm (SD: 0.0334) Average angular deviation: 0.522 degree (SD: 0.235)

Conclusions and clinical implications: In-vitro implant placement using fixed radiographic marker was accurate and predictable method in guided implant surgery. In clinic, radiographic guide can be fabricated simply by bonding radiopaque resin on the teeth. This will eliminate time-consuming lab work and enhance precision of the computer guided surgery.

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Short-term survival of dental implants in a student clinic setting

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Background: Dental implant treatment has since long been a part of the undergraduate dental curriculum. However, the implant coursework has been mainly didactic and limited to model-surgery. Recently implant treatment was introduced also into the undergraduate clinical setting. This study reports our experience after the first 2 years.

Aim: The aim of the study was to evaluate the short-term survival of dental implants when treatment was performed in a student clinic setting.

Methods: All patients with partially edentulous jaws, with no complicating local or systemic factors, who were already receiving dental care at the students' clinic, Department of Dental Medicine, Karolinska Institutet and were in need of a minor oral rehabilitation with one or two implants were offered dental implant surgery at the same clinic. Those who met the inclusion criteria were consecutively enrolledfor further examination. Following preliminary therapy discussion eligible patients were all planned for surgery following CBCT examination. Totally edentulous cases and patients requiring bone augmentation procedures were excluded, as were patients requesting implant therapy in the esthetic zone in the maxilla. The study group consisted of 76 patients (31 F and 44 M) with a mean age of 56 (range 27–87 years) that had an operation with one or two dental implants. In total 120 fixtures (3i, AstraTech and Nobel-Biocare) were installed. The surgery was carried out between September 21, 2009 and November 21, 2011 as a one stage open flap surgical procedure. A healing period of 8 weeks was allowed before loading. Following the first 18 surgeries with no antibiotics, a prophylactic antibiotic regimen was instituted for all other patients (Amoxicillin, 2 g). The surgery was performed at the student's clinic, involving students in semester 9 and 10. One same surgeon (periodontist) was ultimately responsible for the implant installation in all patients. All patients were assessed at 3 month post-operative and after delivery of the prosthetic device.

Results: In total six fixtures were lost 1–5 months after surgery. At the implant level, significantly more fixtures (4) were lost in the patients not receiving prophylactic antibiotic ($P = 0.002$, Chi-square). However, no difference was found between patients receiving antibiotic or not ($P = 0.062$, Fishers exact test).

Conclusions and clinical implications: The short-term survival of implants in a student clinic setting, seems to be in the range of what has hitherto been reported for other populations. Continued research that also elucidates the patient's experience of oral implant surgery and prosthetic outcome is warranted in an educational context.

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Can inflamed extractions socket jeopardize osseointegration of immediate placed implant?

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Background: Immediate implant placement gave opportunity for faster dental rehabilitation of patient. Many times inflammation conditions are found at extraction sight. But for any elective surgery in the mouth, acute inflammation is regarded as contraindication.

Aim: Our goal was to establish whether acute inflammation could adversely affect implant outcome and what could be other risk factors for failures.

Methods: In 96 patients (48 m/48 f), age range 19–86, 140 implants were immediately inserted (34 mandible/106 maxillae) from 2005 to 2011. All were placed subcrestaly after tooth extraction, curettage, irrigation and inspection of sockets. Reasons for extraction were: root fracture (33), root resorption after luxation injury (11), failed treatment of chronical periapical periodontitis (92) and parodontitis gravis (34). Granulation tissue were found in 104 sockets, at 26 sights fistula with pus were presented. Primary stability was achieved beyond apical of socket. Void between socket wall and implant was filed with deproteinized bovine particular grafts. Sinus floor was elevated at 17 sights (transalveolar/lateral approach 14/3). Discontinuity of marginal bone (>1 mm) was found at 20 socket. Healing was performed with 36 temporary crowns and 77 healing abutments, 27 implants were covered with deproteinized bovine bone and resorbable membrane. Antibiotic was prescribed for 10 days. Instruction of soft diet was given to the patients with temporary crown. Clinical and x-ray controls were performed 1/8/16 week after surgery and then annually. Definitive prosthetic were delivered after 4–5 months after first surgical intervention. The loading time was 4–64 months.

Results: Success rate was 98.6% (138/140). One not splinted implant with temporary crown was lost due to no respecting of soft diet, another one (closed healing) was lost during the period of prosthetic treatment. Neither one had any inflammation conditions at primary intervention. Fistulas were closed in 2 weeks. With three patients postoperative hematoma emerged and resorbed uneventfully. At 20 cases with discontinuity of marginal bone more than 1 mm probing depth did not exceed 2 mm.

Conclusions and clinical implications: Although lover survival and success rates were expected at patients with inflammation sights, this was not the case-success rate 100% (104/104). Meticulous aseptic surgery, removal of inflamed tissues, appropriate antibiotic obviously over weighted the threat of infectious non-integration. Sinus floor elevation, bone augmentation with xenogratf did not presented any risk factor for osseointegration. By temporization no corporation patient can be reason for failure. This study should be continued to get long term results.

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Outcomes of osseointegration in fibula free flap after reconstruction of bone defect

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Background: Huge bone defects of scull can be found after tumor resection or pan-facial trauma. The only opportunity for reconstruction of bone is micro-vascular free flap.

Aim: Aim of the pilot study was to find out rate of osseointegration if implant is inserted mono-or bi-cortical in fibula and are there any complications around peri-implant tissue due to lack of keratinized mucosa.

Methods: At four patients (three males, one female), age range 36–62, two mandibles and two maxillas were reconstructed with micro-vascular free flap fibula (cutaneous-muscle-bone at two, two with muscle-bone). Reasons for reconstruction was resection of tumors (3) and loss of almost all maxilla after pan-facial trauma where nasal-oral communication was persisted (1). At two patients with tumors mandibles were reconstructed simultaneously with resection, one needed osteogenic-distraction and free bone graft after 3 years. Other two were reconstructed after 6 months of primary intervention. Perfusion CT-scans of head (2) and angiography of legs (4) were done before reconstruction surgery. After 4 months CBCT-scans with surgical template were performed. Two-stage implants were inserted mono/bi-cortical (5/9) in fibulas and two in residual bone. At one patient re-osteotomy and osteosyntesis with mini plates were done due to get better conditions for insertion of implants. At re-entry all implants were stable. At one patient we performed free-gingival graft due to thin, non-keratinized mucosa around implants. After healing period of soft tissue prosthetic were delivered. Clinical and x-rays control are performed due to protocol.

Results: Success rate was 100% at mono-and bi-cortical inserted implants; one of them was not used due to unfavourable position. Intervention were needed at three implants (two patients) due to peri-mucositis (1)-pocket reducing and peri-implantitis (2)-implantoplasty, bone remodelling, free tissue graft, guided tissue regeneration. In observation period up to 3 years all implants are in function. Crater bone defect was detected at two implants (one patient) due to peri-implantitis because of poor oral hygiene and movable mucosa. Nasal-oral communication was closed.

Conclusions and clinical implications: Our pilot study showed that there is no difference ofosseointegrationif implant is inserted mono- or bi-cortical in fibula bone. Education of proper oral hygiene is one of important factors for long living period of implants. It seems that thick unmovable mucosa around implants is a positive prognostic factor.

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Clinical outcome of sinus bone augmentation without graft; radiological analysis

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Background: Implant treatment for posterior maxilla frequently requires sinus bone augmentation. Applying graft material to the sinus after elevating the sinus membrane is an established modality for sinus bone augmentation. Prof. Lundgren and his collaborators have reported that elevating the sinus membrane with implants without graft material induces new bone formation in sinus.

Aim: The aim of this study is to evaluate clinical and radiographic results of this new technique in severely atrophied posterior maxilla.

Methods: We modified the original method and applied to eight patients: four females and four males from 44 to 77 years old, average 66 years old. The residual bone height was from 1 to 5 mm and the average height was 2.2 mm. After raising muco-periosteal flap of the edentulous region, then the lateral bony window was opened and sinus membrane was elevated. The collagen membrane for GTR and GBR was cut to special shape and this membrane was used to support the sinus membrane and to close the lateral window. We have already reported that utilizing a trimmed collagen membrane is the main modified point. The part of the collagen membrane was inserted under the sinus membrane. Then, the implants were carefully installed and stabilized in the thin bone. Computerized tomography was performed pre-surgically and post-surgically. The secondary surgery was performed. Provisional and final prostheses were delivered at 6–7 months and 8–9 months, respectively. Cone-Beam CT images were analyzed using DICOM viewer software package (OsiriX Imaging software). We observed conditions of posterior maxilla and bone formation around imlants.

Results: We installed 16 implants to 10 posterior maxillas of eight patients. The observation period varied from 6 to 15 months after the loading. In all cases new bone formation around the implant was clearly observed and all the implants were well functioning without any complication. In radiographic analysis, almost all cases showed complete bone formation of lateral window. However, one case showed incomplete bone formation of lateral window.

Conclusions and clinical implications: The present clinical results indicate that this technique is effective in implant treatment for severely atrophied posterior maxilla. However some cases need more long clinical observation by incomplete bone formation.

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A retrospective case series evaluating BioHelixTM dental implants – 5-year results

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Background: High success rates have been reported for both partially and fully edentulous patients, however it has been suggested that Brånemark implants characterized by a relative-

lysmooth surface (machined/turned) showed a tendency to increased early failure rates when compared to implants having rougher surfaces, whereas in the medium-term (3–5 years) Brånemark implants were significantly less affected by periimplantitis than implants with rougher surfaces. A laser micro machining process was developed to create roughness in the inner part of the thread. The aim of this retrospective case series was to study survival rate and complications of Brånemark Integration BioHelixTM dental implants placed according to a conventional standard procedure in consecutively treated patients in a Swedish specialist private practice after 5 years.

Aim: To evaluate, in a case series, survival rate and complications of Brånemark Integration BioHelixTM dental implants, placed according to conventional procedures in patients consecutively treated in a Swedish specialist private practice after 5 years.

Methods: Eighty-three consecutively treated patients received 89 final fixed prostheses supported by 310 implants placed according "conventional" procedures, i.e., no implants shorter than 10 mm, no immediate post-extraction implants, and no bone grafting procedures. In 70 patients implants were left healing submerged whereas 13 patients were treated according to the 1-stage protocol. All restorations were delivered after implant placement. Outcome measures were: implant survival and complications.

Results: Five years after implant placement, two fixtures were removed because of loosening. One fixture was lost after 12 months in the lower jaw in one patient and one fixture was lost in the upper jaw in another patient after 3 years, both inserted with 2-stage technique. No other biological or biomechanical complication occurred which gives a 99.4% fixture survival rate and a 99.3% cumulative success rate.

Conclusions and clinical implications: Brånemark Integration BioHelixTM dental implants placed according to 1- or 2-stage procedures in patients in a private practice provided excellent 5-year results. Randomized clinical trials with suitable controls are suggested to confirm these results.

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Reosseointegration after mechanical breaking of immature osseointegration

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Background: Lack of initial fixation on implant installation is assumed making an increase of failure of osseointegration. These implants can be mobilized with minimal removal torque on fixture uncovering surgery. However, when newly formed woven bone around the implant will be matured, this can make the successful osseointegration.

Aim: The aim of this study was to evaluate the re-osseointegration of the implants reinserted following mechanical breaking of osseointegration in dogs.

Methods: Rotationally mobile implants by using oversized drilling were bilaterally installed in five canine mandibles. After 4 weeks of healing period, immature osseointegration of the implant in experimental group was intentionally broken by mechanical countertorque and reinserted at the same site, while the control group remained submerged without any surgical intervention. The animals were euthanized 4 weeks after breaking of osseointegration. Change of the implant stability quotient (ISQ) and PeriotestTM value (PTV) were analyzed, and bone to implant contact (BIC,%) was histometrically measured.

Results: The mean ISQ and PTV at the end point were similar between the experimental and the control group ($P > 0.05$). BIC of the apical area increased significantly in the experimental group compared with the control group ($P > 0.05$).

Conclusions and clinical implications: It is concluded that the mechanically broken osseointegration might provide successful reosseointegration after submerging for a certain period.

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The implant therapy of crossing the mandibular canal by the guiding of cone beam computed tomography

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Background: Dental implantation of severe atrophic mandible patients represent the risk of shorten of the bone mass, the resorption of the bone around the implant and the injury of mandibular nerve. Although the widespread use ofshort implants expanded the indication of implant for those patients, the width requirement of alveolar bone for short implant and the distance between the crest and the tube is <5 mm cases can't perfect the lack of bone mass. A large number of anatomical studies have proved that the mandibular nerve is running close to the lingual bone plate. With the development of Cone Beam Computed Tomography (CBCT) 3D imaging technology and the measurement software, the well use of buccal bone plate below the neural tube for dental implantation to avoide damage of mandibular canal become reality.

Aim: To explore new methods for implementing implant treatment at severe atrophy mandibular, which avoiding the mandibular neural tube to maximize the use of bone below the neural tube by the guiding of CBCT.

Methods: Inclusion criteria: (1) The distance from the ridge to the tubes is <5 mm^2. No implant surgery contraindications. Preoperative panoramic and CBCT image analysis and measurement, and accurately calculate the three-dimensional position of the nerve tube. Local anesthesia is applied to control the patients reaction of the neurological symptoms during sur-

gery. The prepared hole in the surgery area step by step from the tongue side to the buccal lateral tilt, and finally homologue implant is implanted according to the thickness of the buccal bone plate. The pain and lower lip feel is observed closely during the surgery. Connecting the upper abutment after Six months, custom the individuational angled abutment by the abutment transfer of the implant level to compensate the axial angle of implant and mandible, and establish normal overbite relationship.

Results: Three patients with nine implants was implanted by the protocol above, none of them feel pain or numbness of the lower lip intraoperative and postoperative. During the 6 months follow-up, all implant are well recovered masticatory function after loading, and no loos.

Conclusions and clinical implications: The severe atrophy of the mandible, the mandibular nerve tube is located precisely and the alveolar bone mass is measured in all directions by the CBCT 3D imaging, by which surgon could cross the mandibular nerve to take full advantage of the cortical bone of the buccla bone to implement implant therapy can achieve the desirable effect.

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Modification for NobelGuide in the mandible with flap approach

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Background: When performing flapless implant surgery, the lack of control on the position of keratinized mucosa around dental implants represents a limitation. The absence of adequate keratinized mucosa may negatively influence the outcome.

Aim: To demonstrate a modification of the surgical protocol in computer-guided flapless implant surgery for the rehabilitation of a complete edentulous mandible patient with reduced band of keratinized mucosa.

Methods: A healthy 70 years old edentulous male patient was referred to private practice concerned with poor retention and prosthetic stability. Clinical and radiographic examinations were performed to assess the inclusion criteria: sufficient bone volume, low smile line and mouth opening capability over 50 mm. The mandible presented absence of a residual band of keratinized mucosa of 6 mm wide in the vestibular-lingual aspect. The lower denture respected functional and aesthetic requirements and was used as a radiographic guide for the Computerized Tomographic scan. The Surgical template was manufactured after the computer planning using the Nobel-Clinician software (Nobel Biocare AB). Four NobelSpeedyTM 4 × 15 mm implants were placed following the All-on-4 protocolTM, and an immediate implant retained acrylic-resin prosthesis was connected. The NobelGuide surgical technique was modified using a flap approach, aiming at preserving an adequate band of keratinized mucosa around the implants. After the surgical template stabilization (with the surgical index and anchor pins), the pins and template were removed. A crestal incision from molar to molar was performed and the lingual portion of the flap was reflected; the keratinized mucosa was repositioned through suturing and the template re-stabilized. Success was evaluated according to the following criteria: clinical stability, patient reported function without discomfort, absence of suppuration, infection and radiolucent areas around the implants, and maintenance of the adequate band of keratinized mucosa around the four implants. The follow-up of the patient was 1 year.

Results: No implant was lost, no complications occurred on the implants or prosthesis and the patient reported satisfaction with function and aesthetics. The mean residual band of keratinized mucosa was 8.1 and 8.0 mm at peri-operative and after 1 year, respectively.

Conclusions and clinical implications: Within the limitations of this case report, the NobelGuide modified technique with a flap approach allowed the maintenance of the keratinized mucosa around the implants of a complete edentulous mandible patient and did not compromised the short-term outcome. Prospective designed studies with adequate sample size and longer follow-ups are needed to evaluate the long-term outcome of this modified technique.

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Insertion of zygomatic fixtures under local anesthesia

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Background: Conventional implant rehabilitation of atrophic maxillae necessitates prior extensive grafting. A viable non-grafting alternative is insertion of conventional implants in the anterior maxilla and zygomatic fixtures posteriorly. Zygomatic implants traverse through the maxillary sinus and attach into the zygomatic bone along their path from the alveolar crest. These are usually placed under general anesthesia. Guided planning was carried out and zygomatic fixtures were inserted under local anesthesia in these cases.

Aim: The aim was to reduce surgical morbidity and recovery time in patients undergoing placement of zygomatic fixtures by using guided templates.

Methods: Four patients received ten zygomatic fixtures under local anesthesia. Pre-surgical software planning helped ascertain the anatomy and fixture orientation and length. Apart from anesthetizing the surgical site, bilateral mandibular blocks were administered, to facilitate mouth opening and decrease pain. Sufficient time was permitted to allow relaxation of the jaw musculature between the drills. Two patients received bilateral zygomatic fixtures through guided templates, while another received four zygomatic fixtures through a guided template. The fourth patient received bilateral fix-

tures through conventional surgery. A total of ten zygomatic fixtures and 29 conventional implants were placed under local anesthesia.

Results: The patients allowed zygomatic fixture insertion under local anesthesia. Maximum mouth opening was achieved to allow insertion of the zygomatic drills. Placement of these long implants through guided templates was relatively quick and straightforward. Within the small selection, patients who received zygomatic fixtures via guided templates had significantly less facial edema and pain compared to conventional surgery. Post-operative pain and edema in the conventional surgery was well controlled with non-steroidal anti-inflammatory analgesics. The patients subjected to guided surgery did not exhibit facial edema or post-operative pain.

Conclusions and clinical implications: It is possible to place zygomatic fixtures under local anesthesia with or without guided surgical templates. Guided templates allowed quicker and easier placement, with decreased post-operative sequelae and recovery time compared to conventional surgery. Furthermore, complications of general anesthesia were avoided. However, this sample selection is small and techniques need to be developed to allow safe and predictable placement of these implants in a manner comparable to conventional implants.

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Immediate dental implants in infected sockets compared to implants placed in healthy sockets

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Background: Immediate dental implants placement in previous infected sockets remains to be a controversial topic in implant dentistry.

Aim: To evaluate the outcomes of immediate dental implants placement in infected sockets regarding marginal bone level and implant stability compared to implants placed in healthy sockets and to evaluate a cleaning procedure in order to eliminate the microorganism present in these situations.

Methods: Forty patients with teeth with chronic infections requiring extraction were selected and received 40 dental implants. (Group E). All cases were single root teeth in the maxilla. The microbiological aspects and the cleaning procedure were evaluated taking a sequence of samples for cultures as follows: (1) Sample from the crevicular fluid. (2) Sample from the socket after tooth extraction. (3) Sample after debridement using manual curettes and (4) Sample after applying citric acid 2% for 1 min. After that, implants were placed and baseline periotest stability values and x-ray marginal bone level were addressed. At 4 months, prior to starting the prosthetic part, new periotest values and marginal bone level were recorded. Forty implants placed in healthy sockets in 40 patients served as control (Group C).

Results: The most common microorganism found were *Streptococcus* groups C, H (S. sanguis) and K (*S. salivarius*), *Staphylococcus aureus*, *Bacteroides forsythus* and *Fusobacterium nucleatum*. *Candida albicans* was also found in some samples. Most effective antimicrobials were ciprofloxacin, amoxicillin plus clavulanic acid and metronidazole. Fluconazole was the more effective antifungal medication. Manual debridement was not able to produce an adequate cleaning of the socket. However, this cleaning was improved after applying citric acid 2% as it was shown in the cultures. There was one failure in each group during the evaluation period. Mean Periotest values were −3.19 (0.66) at baseline and −3.77 (0.29) at 4 months (Group E) and −3.25 (0.90) at baseline and −3.91 (0.72) at 4 months. Marginal bone level was considered zero at baseline, in order to evaluate the changes later. Mean marginal bone level at 4 months was −0.21 mm (±0.12) in Group E and −0.18 mm (±0.07) in Group C.

Conclusions and clinical implications: Within the limitations of the present study, immediate implant placement in infected sockets could be considered a predictable procedure. There were not statistical differences compared with implants placed in healthy sockets. Manual debridement alone was not enough to perform an adequate cleaning. In this study, citric acid 2% showed interesting results regarding microbiological control.

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Three year follow-up from a prospective multicentre study replacing single anterior teeth with narrow, 3.0 mm diameter, implants

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Background: In cases with limited space between adjacent teeth and roots, particularly in the anterior regions, there is a clinical need for using narrow diameter implants. This study was designed to evaluate the clinical performance of the newly developed Astra Tech OsseoSpeedTM 3.0 mm diameter implant with early loading in the anterior maxilla or mandible.

Aim: In cases with limited space, particularly in the anterior regions, there is a clinical need for using narrow diameter implants. This study was designed to evaluate the clinical performance of the newly developed Astra Tech OsseoSpeedTM 3.0 mm diameter implant with early loading in the anterior maxilla or mandible.

Methods: This prospective multicentre study was designed for patients missing any of the lateral incisors or a central incisor in the maxilla. In cases where both contra laterals were missing, two study implants were allowed to be installed. Main inclusion criteria were 18–70 years of age, edentulous in the study area for at least 2 months and presence of natural tooth roots adjacent to the study implant. Main exclusion criteria were smoking more than 10 cigarettes per day and a health status that would not allow implant placement. Primary variable in the study is implant survival. Secondary variables are overall implant survival, implant success, implant stability, marginal bone level alterations, soft tissue status, gingival zenith score and safety. The study implants (OsseoSpeedTM TX 3.0S, Astra Tech AB, Mölndal, Sweden) used in the study were of 3.0 mm diameter and 11, 13 or 15 mm lengths. Implants were placed with one-stage surgical procedure with 6–10 weeks healing period.

Results: Sixty-nine patients with 97 study implants were included. The recruitment and treatment phase was completed and all study patients conducted their 3 year follow-up visit. The study population represents various kinds patients with respect to age (mean 32 years, 18–72 years), gender (52% male) and smoking history (16% smokers, 13% previous smokers, 71% non smokers). Complications so far are limited to four lost study implants during the healing period before loading of the implant (95.9% survival) and three fractured Ti-DesignTM abutments. no lost implant have been reported after placement of the crown (100% survival after loading). soft tissues around implants look stable after 3 years, with no signs of recessions and exposure of the abutment.

Conclusions and clinical implications: Conclusion: The 3 year follow up results with OsseoSpeed TX 3.0S are encouraging and show how this kind of implant can represent a first choice option in the treatment of missing incisors where physical space is reduced, thus limiting the necessity of bone augmentation procedures and costs to the patient.

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Zygomatic implants: An achievable surgical option for the rehabilitation of edentulous maxillae?

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Background: In case of atrophic edentulous maxillae, the rehabilitation with a fixed dental prosthesis is traditionally conducted with bone grafts, and the use of zygomatic implants is still minor. To explain this lack of interest, many reasons are reported such as: the technical difficulties of the protocol, especially to obtain a primary stability, the prosthetic challenge caused by the final position of those implants and the anatomic risks in case of deviation.

Aim: The aim of the present experimental *ex vivo* study is to evaluate the feasibility of the surgical technique of insertion of zygomatic implants, and to measure the technical and prosthetic difficulties, and the anatomic risks of this process.

Methods: The realization of quadruple zygomatic rehabilitation was decided in five formalin human cadavers. After a pre operative ct scan with a radiological guide, the position of each implant was planed and the technique of insertion decided. The 20 zygomatic implants were inserted in the five edentulous maxillae with the planed protocol. Each insertion torque (IT) was reported and a dissection associated with a post operative ct scan permitted to visualize the anatomic area and to analyze the prosthetic situation of each maxillary emergence. The following criteria of success were defined: absence of anatomic injury, a correct prosthetic positioning and a sufficient primary stability assessed by each IT.

Results: The integrity of the infra temporal fosse and the orbital cavity was conserved in every cases. Each implant was positioned with a loadable maxillary emergence: canine for the anterior and second premolar or first molar for the posterior implant. The IT measured were sufficient for 18 implants, and the two other implants were mobile. This instability was potentially caused by a planning error and/or an inappropriate drilling with insufficient zygomatic bone around the apex. Considering the defined criteria of success in this study, the insertion of 20 zygomatic implants resulted in a final success rate of 90%. This rate could reach 100% with the integration in the study of two rescue implants inserted to replace the two mobile implants.

Conclusions and clinical implications: With the limits of our study, this *ex vivo* study showed that a preoperative planning in association with followed protocols allows the insertion of zygomatic implants without anatomic injury, in a correct prosthetic position with a sufficient primary Stability. Nevertheless, this type of rehabilitation should only be conducted by experienced surgeons with sufficient anatomic, technical and prosthetic knowledge.

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Accuracy, surgical and prosthetic benefits of a new zygomatic implants drilling guide: an *ex-vivo* study

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Background: One of the available solutions in case of reconstructions of atrophic maxillae is the graftless approach, including zygomatic implants. However, a review of the litterature put the emphasis on the surgical risks of the technique, the potential sinusal complications, and the prosthetic difficulties caused by the positionning of the implants. The use of

a surgical guide could be a solution to improve the positioning of the zygomatic implants.

Aim: The aim of the present *ex-vivo* study is to evaluate the accuracy of a new surgical guide to reduce the deviations measured between the planned and the achieved position of zygomatic implants, and to assess the benefits obtained to minimize the anatomic and surgical risks and to improve the prosthetic positioning of these implants.

Methods: Twenty zygomatic implants (40 mm) were inserted in the maxilla of five formalin human cadavers. A pre operative CT scan allowed the planning of each implant. Ten SG (surgical guided) implants were inserted after a guided drilling protocol used for the first 2.9 mm twist drill in one side of the maxillae, while ten FH (free hand) implants were placed with a free hand drilling procedure in the contro lateral side. A post operative CT scan was performed and the variations between the planned and the effective implants position were evaluated for the SG and FH fixtures.

Results: No anatomic injury was reported during the surgical procedures and 100% of the implants were in a satisfying prosthetic situation. The mucosa-supported drilling guide showed a significant improvement in the zygomatic implants placement, considering the planned and the effective position of the implants: In average, for the SG implants we reported an angular variation of 3.78°, a maxillary deviation of 1.80 mm and a zygomatic difference of position of 2.54 mm, while we observed for the FH implants respectively 5.78°, 2.53 mm and 4.19 mm of deviation.

Conclusions and clinical implications: Considering the method, this study is one of the only comparing a free hand protocol to a surgical guided procedure after a global planning. With the limits of our *ex vivo* protocol, the results reported in terms of accuracy and prosthetic benefits are very encourageing. The use of zygomatic implants should be limited to experienced surgeons, able to manage any surgical problems and to avoid the anatomic risks. However, the use of this new guide could be an interesting tool to improve the prosthetic positioning of this type of implants.

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Bone thermal changes during mini dental implant placement. An *in vitro* study

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Background: Four mini dental implants (MDI) are commonly placed in interforaminal region for immediate stabilization of a lower denture. Type I dense bone present in the anterior mandible could cause bone overheating during MDI placement. Temperature of 47°C for 1 min decreases regenerative capacity and mechanical properties of bone resulting in early implant failure.

Aim: Aim of the *in vitro* study was to examine the effect of implant diameter and length on bone temperature during MDI placement using thermocouple technology.

Methods: MDIs (3M ESPE MDI®, Minnesota) with diameters of 1.8, 2.1 and 2.4 mm and lengths of 10, 13 and 15 mm were inserted in bovine ribs used as a cortical bone model. Bone temperature was measured in water bath at 29 ± 1°C to simulate *in vivo* conditions. Measurements were performed continuously during implant placement using three thermocouples (Energyx®, Serbia) vertically inserted around each implant site, placed at the level of coronal, middle and apical third of the osteotomy, in tripod arrangement and at distance of 0.5 mm from MDI's periphery. Constant distances between thermocouples and MDI'speriphery were secured by a drill guide template. Data from 48 measurements were analyzed using Two-way ANOVA. A P value <0.05 was considered significant.

Results: All temperature increases recorded in this study were in physiological range. A two-factor analysis of variance revealed insignificant interaction between implant diameter and length on bone thermal changes during implant placement ($P > 0.05$). The effect of implant diameter on bone temperature was not significant ($P > 0.05$) whilst, there was a significant effect of implant length (at the depth of coronal, middle and apical third of the osteotomy $P = 0.001$, $P = 0.005$; $P = 0.001$, respectively). Longer implants produced higher temperature increase at each investigated osteotomy depth. At coronal third of the osteotomy, 15 mm long implants produced significantly higher bone temperature increase (5.92 ± 1.43°C) compared to 10 mm long implants (3.11 ± 1.69°C). At middle third of the osteotomy, 13 mm as well as 15 mm long implants resulted in significantly higher bone temperature increases (4.13 ± 1.2°C; 4.74 ± 1.13°C; respectively) compared to 10 mm long implants (2.66 ± 0.45° C). At apical third of the osteotomy, significantly higher bone temperature increases were recorded with 13 mm long as well as with 15 mm long implants (3.76 ± 1.09°C; 4.27 ± 0.66°C; respectively), compared to 10 mm long implants (2.21 ± 0.93° C).

Conclusions and clinical implications: Placement of 10–15 mm long MDIs induces bone temperature increases within the physiological range. Length of MDI has a higher impact on bone temperature compared with implant diameter. Longer implants produce higher temperature.

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A surgical guide for sinus elevation utilizing the Caldwell-Luc osteotomy

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Background: The Caldwell-Luc osteotomyrelies on the careful approximation of the outline of the sinus to be grafted. The osteotomy planned should be inside the sinus borders. This requires the careful manipulation of the sinus membrane, risking damage to the membrane. The varying thickness of the lateral wall requires that the surgeon proceed carefully and rely on visual and tactile senses to avoid piercing the immedi-

ately underlying membrane. CT scan allows the clinician to view the sinus in all dimensions and prepare a treatment plan to establish the outline of the sinus area. But, there has been no mechanism to transfer this precise information to the surgical field. There has thus been a gap between the planning and the accurate transfer of that information into the surgical field.

Aim: The object of the guide is to transfer precise data obtained from a CT scan into the surgical field.

Methods: The anatomy of the sinus is viewed on a CT scan along three axes with every point of the surface of the inner wall of the osteotomy to be plotted with coordinates to provide a 3D outline of the inner walls of the sinus. A guide is fabricated from this study that will have a stable, positive seat over the alveolar ridge. A ledge is incorporated in the osteotomy window in the guide to allow the bur to rest. This ledge follows the exact outline of the sinus area to be elevated as well as providing depth control by maintaining a constant depth for the osteotomy and preventing over-cutting into the sinus.

Results: Following flap reflection, the guide seated positively. The osteotomy was prepared rapidly without incident. The window and membrane were elevated with no dissection or tears of the SM. Graft placement followed by healing was uneventful.

Conclusions and clinical implications: The aforementioned guide significantly reduces the risk of membrane tear by eliminating the lateral wall during the osteotomy, resulting in no dissection of the SM. This is an elimination of one of the two main causes of membrane tear. The depth control provided prevents over-cutting into the sinus and the underlying membrane. This guide simplifies the surgical experience by reducing or eliminating many of the hazards associated with this procedure. Furthermore, it reduces surgical time by transferring the decision making from the surgical field to the diagnostic phase.

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Bone response to implants with different root form and surface

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Background: Implants are designed to maximize initial contact, augment surface area and facilitate the dissipation of stresses at the bone to implant interface. Among these alterations to implant design, surface modification has been by far the most widely researched factor. In light of this research, mass-produced implant surface design has shifted from as – turned to moderately rough, and these modifications have shown positive early healing modulation and higher biomechanical fixation.

Aim: The aim of this study was to evaluate the early bone response of tapered and cylindrical root form implants with two different surface treatments in fresh extraction sockets after 4 and 8 weeks.

Methods: Surface treatments and implant design comprised (n = 9 each): tapered with dual acid-etched surface; tapered with dual acid-etched and sandblasted surface; cylindrical with dual acid-etched surface; and cylindrical with dual acid-etched and sandblasted surface. Implants were placed in the distal sockets of mandibular premolars [(2) P (2,) (3) P (3,) (4) P (4)] of six beagle dogs, remaining *in vivo* for 4 and 8 weeks. After sacrifice, the implants were subjected to torque to the point of interface fracture and subsequently non decalcified for histomorphological study. Statistical analysis was performed by a General Linear Model analysis of variance model with a significance level of 5%.

Results: Torque to interface fracture was significantly greater for the cylindrical with dual acid-etched and sandblasted surface group than for the other groups ($P < 0.001$). Histomorphological analysis showed woven bone formation around all implant surfaces at 4 weeks and its replacement by lamellar bone at 8 weeks. Study time (4 or 8 weeks) did not affect torque measures.

Conclusions and clinical implications: The double acid-etched and sandblasted sample surface increased early bone biomechanical fixation of both cylindrical and tapered root form implants. The cylindrical root form implants showed higher torque to interface fracture values when compared with the tapered root form implants. The cylindrical with dual acid-etched and sandblasted surface group showed the highest biomechanical fixation values ($P < 0.001$). The implant thread design and surface structure played a significant role in their biomechanical fixation during early stage following implantation.

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Marginal periimplant bone loss at implant-supported single-tooth replacement: a 10-year prospective clinical study

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Background: Long-term success rate of implants is associated with marginal bone loss. This may also affect periimplant soft tissue and good aesthetic outcome. However the occlusal overload cause a bending moment at the crestal bone which may result in more marginal bone loss or even fracture of dental implants.

Aim: Radiographically evaluate marginal periimplant bone loss (MPBL) on implants after 10 years after loading.

Methods: Thirty implants were placed in 30 patients, aged 20–75 years, in the mandible 56.6% and 43.4% in the maxilla. The mean implant lenght was 13.5 mm. Implants with diameter in 3.75–4.5 mm range have been used. The implant installation was performed as two-stage procedure. Full-thickness flap surgery technique was used. Healin interval was 6-months. All of them were supplied with single crowns. Two implants were lost. The 10-year cumulative survival rate was 93.3%. In this 10-year interval 92.8% were free of complications. Radiographic analysis was performed at crown placement, 1-year -and 10-years post loading.

Results: The radiographic bone-to-implant level shows a mean loss of MPBL 0.5 mm first year after loading and additional 0.2 mm 10-years post loading.

Conclusions and clinical implications: Vertical bone loss is still observed in some cases. Main marginal bone loss was observed in the first year after implant placement. The observed bone alteration after the crown placement was insignificant and did not affect aesthetic appearanca of the restorative therapy.

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Edentulous jaws restoration with guided surgery and immediate loading

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Background: In order to to minimise patient discomfort and restore functionality and aesthetics quickly so that patients can return to their normal routine soon. There is a growing need for patients to be rehabilitated with a fixed, implant-supported prosthesis immediately after surgery.

Aim: This study aims to retrospectively evaluate the clinical and radiological performance of 3D software planning, guided surgery and immediate delivery of provisional prosthesis in the treatment of fully edentulous jaws.

Methods: Twenty-three fully edentulous ridges (15 maxilla, 8 mandible) were restored. All ridges (20 patients) were treated with computer assisted implant surgery protocol (Nobel Guide, Nobel Biocare) and screw-retained provisional metal-acrylic prosthesis prepared ahead of surgery and delivered immediately.. Overall 120 implants (NobelReplace Tapered Groovy) were placed. One hundred and seventeen implants were immediately loaded while the remaining three were delayed loaded; 12 of them inserted in fresh extraction sockets. A flapless approach was used in 14 maxillary arches and in one mandibular case. Definitive prosthesis was delivered after 6–12 months (screw-retained zirconia or titanium Procera Implant Bridge with ceramic or composite resin respectively). Outcome measures were radiographic marginal bone-level changes, implants survival, soft tissue parameters s (probing depth, and BOP index) and patient satisfaction.

Results: All the patients had passed at least the 24 months follow-up. Three immediate loaded implants failed after 6 months accounting for a cumulative survival rate of 97.4%. Every patient judged the prosthetic rehabilitation received with high degree of satisfaction when it comes to masticatory function, social functioning and overall quality of life. Radiological examination, showed a mean marginal bone loss of 1.5 ± 0.3 mm after 24 months. All the patients presented healthy soft tissues with stable probing depth BOP values over time Some minor prosthetic complications occurred: fracture of provisional prosthesis (four cases), ceramic chipping (one case).

Conclusions and clinical implications: Within the limitations of this study, the relatively low number of patients treated and short follow up duration (24 months) computer guided surgery and immediate loading seem to represent a viable option for the treatment of completely edentulous jaws.

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A modified osteotome sinus floor elevation technique for placing short implants with minimal crestal bone

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Background: The maxillary sinus lift procedure has enabled clinicians to offer implant-supported prostheses even in cases with severe bone atrophy and/or increased pneumatization of the maxillary sinus.

Aim: To introduce two techniques of osteotome sinus floor elevation (OSFE) combined with simultaneous short implant placement in the treatment of edentulous posterior maxilla subject to severely insufficient bone height, as well as to evaluate the clinical effect in a prospective study.

Methods: All implants were placed following a one-stage protocol. Short implants (Bicon Dental Implants, American) were placed in the posterior maxilla in 21 patients. The residual vertical height of bone under the sinus was 2.95 mm, ranging from 0.96 to 4 mm. Two different procedures of OSFE (using spiral drills) with or without bone grafting was applied. The final prostheses were restored 9 months later. The stability and osseointegration of the implants were clinically evaluated, also the endo-sinus bone gain around the implants were measured. The mean observation follow-up period was 12 months.

Results: The survival rate was100% during the study period. Each out of the implants was clinically stable and was loaded without pain or any subjective sensation. No implants had detectable sinus membrane perforation during operation. The radiographic results demonstrated that the endo-sinus bone gain was 5.67 mm.

Conclusions and clinical implications: Based on the results and within the limits of the present study, it can be suggested that

short implant placement in conjunction with OSFE could yield predictable clinical results for edentulous posterior maxillary region with RBH less than 5 mm. It represents a feasible modality of treating the severely atrophic posterior maxilla in areas with reduced bone height subjacent to the sinus. Besides, from the clinical point of view, these techniques may reduce the indication for complex invasive procedures and simplify treatment in the posterior.

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Treatment of mandibular ameloblastoma using intra-oral graft and implants: a case report

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Background: The mandibular ameloblastoma is a benign odontogenic tumor that develops from the remaining components of the enamel organ. It is a slow growing, locally aggressive tumor capable of causing facial deformity. It has a high recurrence rate due to its capacity to infiltrate trabecular bone. The literature presents options to treatment of ameloblastoma with conservative or radical approaches.

Aim: The aim is to present a case report of ameloblastoma that was performed a mandibular resection associated to autogenous intraoral graft followed by osseointegrated implants rehabilitation.

Methods: A 24 years old female patient of authors clinic presented in a panoramic radiograph and a CT scan similar images to multicystic ameloblastoma, involving teeth with buccal cortical swelling. Under general anesthesia were performed the resection of lesion and teeth extraction followed by autogenous bone reconstruction. Onlay intraoral bone blocks from retromolar region were fixed with titanium micro screws in conjunction with rich platelet plasma (RPP). The results of histopathologic study were multicystic follicular ameloblastoma.

Results: A control postoperative CT scan was performed 6 months after surgery, confirming consolidation of the graft. Reentry was performed at 6 months after first surgery to retrieval of titanium micro screws and placement of osseointegrated implants. The patient was followed up in a period of 5 years after prosthetic rehabilitation and there is no evidence of recurrence.

Conclusions and clinical implications: The treatment performed in this case confirmed that a conservative approach is a good option for treatment of follicular ameloblastoma.

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The influence of postoperative amoxicillin on success of dental implants: A placebo-controlled randomized clinical trial

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Background: Some dental implant failures are due to bacterial contamination at implant insertion. Infections around biomaterials are difficult to treat and almost all infected implants have to be removed. In general, antibiotic prophylaxis is indicated in patients with risk of infectious endocarditis, with reduced host immune response, patients with metabolic diseases, patients receiving radiation in areas of the head and neck, in cases of extensive and prolonged surgical procedures, and when surgery is performed in infected sites or large foreign materials are implanted. To minimize infections after dental implant placement various presurgical or postsurgical systemic antibiotic regimens have been suggested. With the administration of antibiotics adverse events may occur, ranging from diarrhoea to life-threatening allergic reactions. Another major concern associated with the widespread use of antibiotics is the selection of antibiotic resistant bacteria. The use of prophylactic antibiotics in implant dentistry is controversial. Although there is no clinical trial available to show the effectiveness of prophylactic antibiotic after implant placement, most surgeons use a prophylactic antibiotic regimen that is continued for up to 1 week after surgical implant installation. Recent Cochrane systematic review reported that a single preoperative dose of 2 g amoxicillin given orally 1 h before implant placement might reduce failures of dental implants placed in ordinary conditions. However, it is still unknown whether postoperative antibiotics are beneficial.

Aim: The objective of this placebo-controlled triple blind randomized controlled clinical study was to compare the outcomes of dental implant treatment with and without prolonged antibiotic prophylaxis.

Methods: Forty-six systemically healthy patients included in this study. Patients needing bone augmentation procedures were not included. After dental implant surgery, the test group (n = 23) received 500 mg amoxicillin (three times a day for 7 days) and the control group (n = 23) received placebo. Postoperative pain and swelling, early failure (failure occurring within 7 days after surgery) and late failure (failure occurring within 3 months after surgery) were assessed.

Results: A 66.7% and 90.9% of the patients in test and control groups reported postoperative swelling (P = 0.07). The average (±SD) scores of visual analogue scale (0–100) were 31.04 (±26.29) and 37.73 (±23.69) in test and control groups (P value = 0.37). Early implant failure occurred in one of the

patients of control group (P value = 0.22). One patient in test group and one patient in control group showed probing depth of 5–7 mm after 3 months (P value = 1).

Conclusions and clinical implications: The results of this study showed that prolonged administration of amoxicillin after routine dental implant surgeries has no significant effect in preventing implant failure. Further studies with larger sample size are necessary to confirm the results of present investigation.

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Effectiveness of Dexketoprofeno trometamol administrated before surgical implant

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Background: Ensuring an adequate pain control during and after the surgical implant procedure is one of the more important aspects to the patient.

Aim: Determining if Dexketoprofeno trometamol is more effective administrated 30 min before a conventional implant surgery than a placebo drug.

Methods: From November 2009 to November 2011, 100 consecutive patients were included in the study. Patients were randomly allocated to one of the groups test or control. A total of 84 implants were included in this randomized, blinded prospective clinical study, considering the patients as a unit. Sixteen patients were drop out.

Results: Both groups started to feel pain 2 h after surgery and reached the maximum pain after 8 h. In general, pain could be considered since soft until moderate. No statistical differences were encountered between both groups when we considered preventing the postoperative pain.

Conclusions and clinical implications: The use of Dexketoprofeno trometamol does not avoid the postoperative pain between 2–8 h after dental implant surgery.

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Immediate implant replacement therapy for peri-implantitis patients

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Background: Various therapeutic treatment options were tried on the peri-implantitis patients. Such cases are thought to be difficult to treat, and the efficacy of treatment is limited. Simple and effective treatment option is the best option.

Aim: Replacement therapy, which consisted of the removal of the peri-implantitis fixtures by the use of several low-invasive devices and new-implant installation to the peri-implantitis sites, was evaluated in the mandible.

Methods: Twelve implants with peri-implantitis were investigated during a 3-year period (2009–2011). After thorough initial treatment for periodontitis, implant fixtures were removed by the use of low-invasive devices (piezoelectric and/or low-invasive implant removal devices). Just after the removal of implant fixtures with the surrounding granulation tissue, transmucosal-type implants were installed. Minimal autogenous particulated bone tips were grafted into the surrounding peri- implant spaces. As well as a clinical examination, pre- and post-operative implant mobility (Periotest- and RFA-value) and probing pocket depth, and insertion torque during the operation were evaluated.

Results: Postoperative conditions were good and no complications were detected. The average of the periotest- and the RFA-value of the removed implants was −0.23 and 71.0 ISQ respectively. Insertion torque was over 50 Ncm in 8 of 12 implants. The RFA value just after the operation was 78.9 ISQ, and 80.2 ISQ 3 months postoperatively. Preoperative probing pocket depths of 7.58 (SD 2.31) mm reduced to 2.57 (SD 0.50) mm at the 6 month-evaluation stage, and continued at the same level for 18 months. All final restorations were fabricated within 5 months.

Conclusions and clinical implications: Under thorough oral hygiene instructions, immediate implant replacement therapy to the peri-implantitis patients was performed, and revealed good results. Within these investigations, immediate replacement therapy can be an effective option for peri-implantitis patients.

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One-year survival of 6 mm short dental implants related to implant site

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Background: Short dental implants are indicated when the bone volume is not adequate for placement of conventional dental implants without performing bone grafting. However, atrophy of the alveolar process often results in an unfavourable jaw relationship and increased maxillo-mandibular space, with the inevitable prosthetic consequence of excessive crown height. The higher the crown, the longer the lever arm, the greater the Crown/Implant ratio, and consequently the greater the stress of the bone crest. Increased marginal bone stress can lead to progression of marginal bone loss and eventually to implant loss. Crestal bone stress can be minimized by splinting the implant crowns together since the applied forces are favorably distributed between the implants. When multi-

ple implants are splinted together, the occlusal forces are minimized because tensile and shear stresses are concentrated in the connector regions, which reduces the force transferred to the peri-implant bone.

Aim: To evaluate 1-year survival rate and the marginal bone loss related to implant site of 6 mm short Astra Tech OsseoSpeed dental implants installed in the atrophic maxilla and mandible and splinted at least in pairs.

Methods: A total of 53 short dental implants with a diameter of 4 mm and a length of 6 mm were placed in the partially edentulous jaw of 16 patients. Clinical and radiological examinations were performed post-operatively, at the time of abutment installment and 1 year postoperatively. The marginal bone loss and crown-to-implant (C/I) ratio was evaluated using ANOVA and *post-hoc* tests. The survival rate was estimated using crude rates and exact binomial confidence limits.

Results: Two mandibular implants placed in the molar sites of one patient were lost at the abutment connection resulting in a survival rate of 93.3% (95%-Confidence limits: 77.9–99.2%). All the other implants survived the first year. The maximal marginal bone loss was generally less than 0.35 mm during the first year in function and crown to implant ratio (C/I) ranged between 1.4 and 2.6 with a mean C/I ratio of 2.00.

Conclusions and clinical implications: This study is the first to report survival and bone level changes of short dental implants related to instalment site. Provided that force orientation and load distribution are favourable and parafunction is controlled, the 1-year survival rate of 6 mm short Astra Tech OsseoSpeed dental implants is comparable to that of conventional longer ones.

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Hard and soft tissue maintenance at immediately provisionalized OsseoSpeed implants placed into extraction sites: 2-year results

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Background: The main objective in modern implantology is to maintain and support peri-implant osseous and soft tissue structures to combine long-term osseointegration with an esthetic and natural peri-implant mucosa. The major advantages of immediate implant insertion in comparison to delayed implant placement protocols are a reduced treatment time, less number of sessions and the minimally invasive procedure.

Aim: The aim of this study examined the clinical performance of OsseoSpeed implants placed into extraction sockets with immediate provisionalization in the anterior maxilla with a 2-year follow-up.

Methods: Twenty patients received a total of 37 OsseoSpeed implants which were immediately inserted into extraction sockets with and without facial bone deficiencies of various dimensions. A flapless procedure was applied and the implants were immediately provisionalized with a temporary crown without occlusal contacts. Facial gaps between implant surface and facial soft or bone tissue were grafted with autogenous bone chips. Implants in diameters 3.5, 4.0, 4.5 and 5.0 with lengths 11–17 mm were used in the study. During the course of the study, implant success rates, marginal bone levels and the Pink Esthetic Score (PES) were assessed per implant.

Results: All 37 implants were still in function at the final follow-up (survival rate: 100%), one patient with three implants did not follow the study after prosthesis delivery. The mean follow-up period of remaining 34 implants was 27 months (range, 12–40 months). Marginal bone levels averaged at the level of the implant shoulder (mean −0.1 ± 0.55 mm, range, 1.25–1.47 mm). Mean PES ratings were 11.4 ± 1.8 (range, 6–14) at the final follow-up. In 78% of the patients PES was completely preserved or even improved.

Conclusions and clinical implications: Survival rates, marginal bone levels, and esthetic results suggest proof of principle for the preservation of marginal bone level at immediately placed and provisionalized OsseoSpeed implants after a 2-year follow-up. Implant sites with facial bony deficiencies can be predictably treated with a favorable esthetic outcome using the immediate implant insertion, immediate reconstruction and immediate provisionalization technique.

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Maintenance of marginal hard and soft tissue support at immediately provisionalized OsseoSpeed profile implants – 2-year results

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Background: To overcome the disadvantages of staged implant surgery and treatment, immediate loading concepts as well as flapless surgery approaches have been introduced in recent years. Specifically, promising results in terms of high success rates and remarkable esthetic outcomes have been reported for implants placed in extraction sockets and immediately loaded via provisional crowns and prostheses. In the anterior maxilla the extraction socket anatomy is sloped in a lingual to buccal direction and the placement of a regular implant is not optimal.

Aim: A dental implant with a sloped marginal contour, OsseoSpeed Profile (Astra Tech AB, Mo lndal, Sweden), has been developed to optimize implant placement in such situations. The study examined the clinical performance of OsseoSpeed Profile implants and the transgingival components in a one-stage procedure with immediate insertion and provisionalization in the anterior maxilla.

Methods: Twenty-two OsseoSpeed Profile implants were inserted in 17 patients. All implants were placed immediately

into extraction sockets. Facial bony defects (two total, eight partial losses of the facial lamella) were reconstructed immediately with autogenous bone chips without raising a flap. All patients received immediate provisional restorations. Primary outcome variables were implant survival, marginal bone levels and Pink Esthetic Score.

Results: Mean primary stability at time of implant insertion was 23 Ncm; three further implants had to be excluded because of insufficient primary stability for immediate provisionalization (below 15 Ncm). Mean follow-up was 24 months (range 15–28 months). There was one implant loss. Cumulative survival rate according to Kaplan-Meier was 95.7%. Marginal bone level remained stable from the time of implant insertion to the final follow-up. In 73% of the implant sites it was possible to keep the gingival esthetics stable or even to improve it from the pre-operative examination (mean 10.6, SD 2.3) to the final follow-up (mean 11.5, SD 1.4).

Conclusions and clinical implications: Results of survival rate, marginal bone stability and esthetic improvement suggest proof of principle for immediate provisionalization of Astra OsseoSpeed Profile implants.

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Office-based 2-stage posterior maxillary segmental osteotomy for mandibular implants placement: clinical study

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Background: When mandibular molars are not replaced after extraction, the long-term problem of inadequate interarch space for implant can arise. In the past, treatment options included restoration of the mandible in an abnormal occlusal plane by shortening the teeth, which could cause the teeth to be minimally functional and unesthetic; extensive foreshortening of the extruded antagonists, necessitating possible endodontics and periodontal crown-lengthening surgery and prosthodontic treatment; a combination of the previous two options and no treatment. The most radical treatment option suggested to extract the extruded teeth to gain posterior interarch space. For patients who deny to extract more teeth, this option can be considered as unacceptable. Schoemann and Subramanian described an alternative to these options. The posterior maxillary segmental osteotomy (PMSO) is a simple but precise technique to manage this problem. They performed one staged posterior segmental osteotomy of the maxilla with repositioning of the segment superiorly. After this procedure is completed, and once optimal interach space and a favorable occlusal plane have beed established, implants can be placed or removable prosthetic rehabilitation can be initiated.

Aim: PMSO was introduced by Schuchardt as two-stage surgery to correct the anterior open bite deformity and was modified by Kufner (1970) into a one-stage surgery. After that, most of cases was performed in one stage surgery under general anesthesia. However, we proposed that two stage technique was more stable and able to be performed under local anesthesia. The purpose of this study was to present 10 cases of PMSO for mandibular implant placement and to discuss efficacy and stability of this technique.

Methods: Ten patients who received two-stage PMSO for mandibular implant placement from 2003 to 2008 were included in the study. Of the 10 patients, eight were women and two were men. Ages ranged from 28 to 72 years (mean 46.9). Probable complications were investigated such as sinus infection, survival of bone segment, inflammatory root resorption of adjacent teeth, relapse of bone segment, timing of implant placement & delivery of implant prosthesisand stability of bone segment.

Results: None of patients had sinus infection sign orinflammatory root resorption of adjacent teeth after second surgery. Bone segment was stable by opposed implant prosthesis and had good healing appearance at 4, 8, 12 weeks and 6 month after the surgery.

Conclusions and clinical implications: This clinical study explains the role and efficacy of office-based orthognathic surgery under local anesthesia in planning treatment for the severe extrusion of the posterior maxilla. This procedure allow the natural dentition to be retained, while recovering both a functional occlusion and esthetics that does not require general anesthesia.

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Evaluation of a protocol for a two stage bone expansion procedure in the mandible

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Background: The lack of adequate bone thickness is a limitation for implant placement. Ridge splitting is a procedure to increase bone width. It can be done in one or two stages. In two-stage approach, after the separation of the bone plates, a graft is placed between them to help maintain the increase achieved. Although this is a predictable procedure, the biologic remodelling of the graft is needed in order to get new bone formation.

Aim: To evaluate a protocol for ridge splitting using a space maintainer, without a graft interposed.

Methods: Five cases with reduced bone thickness, with indication for a two stage ridge splitting, were selected. After raising the flap, a longitudinal bone cut to the proper depth, according to the future implants, and two vertical cuts, at mesial and distal of the working area using piezoelectric surgery were performed. Subsequently, a side action expander was introduced in the longitudinal cut to separate the plates. This has a fixed part and a mobile one. The later is moved bucally by rotating

a wheel. Once the separation was obtained, of about 3 mm to avoid a possible fracture of the buccal plate, a 2.8 mm diameter screw was placed between the tables to act as a space maintainer, avoiding the use of a graft. Finally the area was covered with a collagen membrane and soft tissues were closed without tension. Re-entry was performed at 45 days. Surgical sockets were created using threaded expanders and the implants were placed.

Results: All cases showed new bone formation at the time of reentry. Bone width gain was between 5 and 7 mm, being the highest when complementary ridge splitting was carried out at the time of implant placement.

Conclusions and clinical implications: Within the limits of this pilot study, the protocol used has proved to be effective in all cases. The side action expander was useful to obtain a controlled expansion of the plates. The use of a space maintainer in conjunction with a collagen membrane allowed a "*de novo*" bone formation, without having to wait for the remodeling of a graft, which speeds the treatment time and gives a better bone quality at the time of implant placement. A larger scale controlled study is needed to confirm the observations made.

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Immediate implants following tooth extraction: report of case series

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Background: Immediate placement of dental implants have been claimed of the potential advantages such as reductions in the number of surgical interventions, a shorter treatment time, an ideal three dimensional implant positioning, the presumptive preservation of alveolar bone at the side of the tooth extraction and soft tissue aesthetics.

Aim: The aim of this study was to evaluate the placement of immediate implants following tooth extraction.

Methods: Patients referred to the oral surgery clinic for extraction and implant therapy were included in the study. A consecutive series of patients suitable for immediate placement in combination with extraction was subjected to implant surgery. Patients with ongoing inflammatory, exacerbating processes were not included. A two-stage surgical procedure was planned to optimize marginal bone healing. All patients were to be followed clinically and radiologically. Fifteen teeth in 12 patients (8 male; 4 female, mean age: 46.08) were evaluated for this case series and were scheduled for tooth extraction and immediate implant placement. Following flap elevation and the removal of a tooth, implant placement was made into the tooth extraction sites. In six of the cases membranes and bovine bone graft materials were used. The flaps were subsequently replaced and secured with sutures in such a way that the healing cap of the implant was exposed to the oral environment.

Results: Immediate implant placement demonstrated acceptable clinical and radiographic outcomes over a 8 months period in 12 patients with 15 implants. They were followed for 8–72 months (mean: 20.75 months). All implants were osseointegrated at the time of abutment connection. No complications were observed. Immediate implants have predictable results with several advantages over delayed implant placement. None of implants were neither lost nor demonstrated progressive bone loss beyond acceptable levels.

Conclusions and clinical implications: Immediate implant placement following tooth extraction might be a viable alternative to delayed placement. However, it requires a careful case selection and a specific treatment protocol because it is a very sensitive technique and more difficult to execute than a conventional protocol.

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Crestal approach sinus lifting and simultaneous implant placement with a novel trephine design: a case report

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Background: Various techniques have been described in the literatures, concerning either crestal or lateral approach for sinus lifting. Sinus lifting has a high percentage of success, but presents a number of intraoperative complications such as membrane perforation, fracture of the residual alveolar ridge, obstruction of the maxillary osteum, hemorrhage, and damage to adjacent dentition.

Aim: The aim of this clinical case is to present a sinus lifting technique with the crestal approach to sinus that minimizes the risk of Schneiderian membrane perforation using the surgical instruments from a cas-kit® (Hiossen).

Methods: A 65 year-old male patient referred to our clinic for the missing teeth on his right maxilla. In a radiographic evaluation we observed a right maxillary sinus pneumatized with a low bone height (6 mm). The patient did not have any medical nor surgical contraindication for maxillary sinus lifting operation. Surgical procedure has been performed under a local anesthetic nerve block. As a first step diameter and lenght of 3.5 × 11.5 implants were placed in the right first and second premolar region. Sinus lift operation and implant placement was carried out at the same time in right first molar site to minimize the number of operations for the patient. Approach to sinus membrane was achieved using the cas-kit® instead of laterally penetrating sinus area and lifting. The autraumatic design of the drill tip allowed the user to perform sinus surgery. Following the usage of stoper system drill tip membrane lifting was confirmed with depth gauge, then the confirmation

hydraulic lifter was used to raise the membrane. Finally the elevation of the membrane bone material was transported to the grafting site and then with bone condenser bone grafting material was vertically compacted and then the implant was fixed which enabled us to use diameter and lenght of 3.5 × 10 mm. To prevent early postoperative complications of sinus lifting, antibiotics and analgesics were prescribed and the patient was given information on postoperative care.

Results: At the end of one and a half year we observed all implants were osseointegrated succesfully. No complications were seen concerning sinus membrane.

Conclusions and clinical implications: It can be concluded that in the case described, the use of trephine drills of the cas-kit® allows safely lifting of sinus membrane while drilling and its a unique stoper system that prevents over drilling into sinus cavity and its a simple and intuitive surgical system with its ability to combine osteotome in surgery.

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Florid cemento-ossous dysplasia: a case report

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Background: The term florid cemento-osseous dysplasia (FCOD) was first suggested by Melrose *et al.* in 1976 to describe a condition of exuberant multi quadrant masses of cementum and/or bone in both jaws and in some cases, simple bone cavity like lesions in affected quadrant. The word 'florid' was introduced to describe the wide spread, extensive manifestations of the disease in the jaws.

Aim: The aim of this study is to present clinical and radiographic features and the management of a patient with florid cemento-osseous dysplasia.

Methods: Our patient is a 25 year-old woman. At the time of dental radiographic examination, bilateral radioopaque lesions was revealed and the patient was directed to our faculty. She has no clinical complaint. Orthopantomograph showed ovoid radioopaque masses in wide radioluscent spaces in the periapical areas of all the molars in both the quadrants of the mandible and in the maxillary right quadrant. All the teeth were vitals, except the right first molar. There was no expansion in the mandible.

Results: Biopsy was not done as the case was diagnosed on the basis of the characteristic features seen on the radiographs. The patient was followed up periodoically.

Conclusions and clinical implications: The etiopathogenesis of the FCOD is not clear. Waldron *et al.* have proposed that reactive or dysplasic changes in the periodontal ligament might be a cause for the disease. The lesions are characterized by replacement of bone by connective tissue matrix, the matrix displaying varying degrees of mineralization in the form of woven bone or cementum-like round basophilic acellular structures. The affected area undergoes changes from vascular bone into auricular cementum-like lesion. The biopsy FCOD have a risk of osteomyelitis than we have not applied a biopsy to our patient. FCOD tends to affect middle aged women, particularly women of African American and Asian descent. The lesions often affect both sides of the jaw and are symmetrical. Clinically, FCOD are asymptomatic but sometimes there may be localized expansion of the cortical plates or symptoms of dull aching pain or drainage. The radiographic appearance of FCOD depends on the degree of maturation of the lesion. The lesion may appear as radiolucent, mixed or lobulated dense radiopaque masses with radiolucent halo, usually located in tooth bearing areas. Most of the times, these lesions are diagnosed incidentally on routine radiographic examination.

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Oral-clinical findings and management of a patient with epidermolysis bullosa

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Background: Background: Epidermolysis bullosa (EB) is a general term that encompasses one acquired and several genetic varieties (dystrophic, junctional, simplex) of disease that are basically characterized by the formation of blisters at sites of minor travma. Extracutaneous mucosal features include oropharyngeal, laryngeal, oesophageal and genitourinary involvement. The several genetic types range from autosomal dominant to autosomal recessive in origin and are further distinguished by varying clinical features, histopathology, and ultrastructure. Nails may be dystrophic in some forms of this disease.

Aim: The aim of this study is to present clinical and radiological features and the management of a patient with epidermolysis bullosa.

Methods: Our patient was a 26-year-old woman. She applied to our faculty with multiple dental caries and difficulty to chew. The patient had a diagnose of epidermolysis bullosa. There was no consanguinity between her parents. She has had one or two operations from her hands in her childhood because of finger deformation. During the clinical examination we noticed some lesions on the skin, resulting from the bullae formation and the hair of the patient was scarce. The intraoral examination revealed that most of her teeth were decayed. The oral hygiene was poor due to her limited mouth opening and her insufficient manipulation ability. After the radiological examination, we planned tooth extraction, periodontal and endodontic treatment.

Results: The maxillar incisives and molars of the patient were decayed, the crown of these teeth were damaged and the restoration was very difficult, as a consequence the teeth numbered 11, 12, 14, 15, 16, 21, 22, 25, 26 were extracted. The patient

was given periodontal treatment and oral hygiene education, and then the teeth numbered 24, 41, 31, 32, 35 were endodontically treated. We planned a prosthetic restoration, as the patient had eating difficulties.

Conclusions and clinical implications: Epidermolysis bullosa (EB) consists of a group of rare-skin related diseases which are acquired or genetically transmitted. The common feature of all subtypes of epidermolysis bullosa is bullae formation from minor provocation, usually over areas of stress such as elbows and knees. The dental treatment of EB patients is difficult because of the severe blistering. The treatment of our patient showed difficulties due to her limited mouth opening but we could complete dental treatment and the management was finalised with a maxillar dental prosthesis.

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Clinical outcomes of computer guided implant surgery using mucosa supported surgical guide

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Background: A CT-based surgical guide can allow precise implant placement and reduce the risk of damage to adjacent structures. Accurate application the presurgical plan to the patient also facilitates restoration permits implementation of restorative goals.

Aim: The aim of this study was to investigate the clinical outcomes of the computer guided implant surgery using mucosa supported surgical guide after a mean of 12 months follow-up period.

Methods: Eight patients included 74 implants with total of 11 edentulous jaws which have adequate bone volume and bone height were involved in this study. After volumetric tomography of the patients, the virtual implant placement was planned through a software (SimPlant, Materialise Dental, Belgium). A mucosa-supported surgical guide (Materialise Dental, Belgium) was fabricated with reference to virtual implant placement. Following the computer guided implant placement and osseointegration of the implants, all patients were treated with full arch implant supported fixed prosthesis. Periapical radiograph of implants using parallel technique was taken at insertion of the implants, after placement of prosthesis and a minimum of 6 months. Plaque, gingival index scores and the loss of height of the keratinized gingival tissue around implants were recorded for all implant restorations at baseline and last recall. The satisfaction of patient was recorded as an assesment of questioannaire and evaluated with VAS scale. All datas were analyzed statistically.

Results: The overall 92% cumulative survival rate achieved after a mean follow-up of 12 months. Six implant failures were recorded. Mean marginal bone resorption for all implants at the time of prosthetic loading and after a mean of 12 months follow up period was 0.32 mm and 0.57 mm respectively. Gingival and plak index scores were significantly increased after 12 months follow-up period. The loss of the height of keratinized gingival tissue around implants was recorded 0.38 and 0.70 mm. After 3 months and at the end of 12 months follow-up period respectively.

Conclusions and clinical implications: Within the limitation of this preliminary clinical study, the computer guided implant surgery using mucosa supported surgical guides is predictable with a high survival rate. This treatment method can significantly reduces the surgical time, post surgical pain, discomfort and swelling and provides the evaluation of optimal implant size and position relative to anatomic limitations, existing deficiencies, and variations.

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Use of intraosseous anaesthesia in dentistry and oral implantology

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Background: Today, local anesthesia techniques are applied during dental treatment in order to achieve numbness, painless treatment and these techniques are easy to provide. But conventional local anesthesia techniques still result in problemsforcliniciansandpatients alike: fear of the injector, entry of the needle into the tissues, pain during administration of the solution, paresthesia of soft tissues following completion of the treatment and accidents that occurin pediatric patients. Intraosseous anesthesia, a recently developed technique, administers the solution into the cancellous bone, making it possible to provide numbness only for the relevant specific treatment area. Nowadays there are computer associated intraosseous anesthesia opportunies readily available for achieving rapid, efficient and painless numbness.

Aim: The purpose of this presentation is to demonstrate the advantages and disadvantages of intraosseous anesthesia techniques and their utilization in general dental practice and oral implantology.

Methods: In this poster presentation, the "Pubmed" search engine was used with the key words intraosseous anesthesia, intraosseous injection and oral implantology. The English literature was reviewed in between the years 1996 through 2011.

Results: We observed that intraosseous technique has some advantages including painless and rapid onset of anesthesia as well as the ability to anesthesize both the palatal and the lingual soft tissues from a single port of needle entry. On the other hand however, the technique has disadvantages such as longer implementation period, blockage of the needle tip in patients with high bone density, shorter duration of action especially in surgical procedures and tachycardia in young and healthy individuals.

Conclusions and clinical implications: We believe that this technique is mainly useful for restorative and, endodontic treatments as well as basic tooth extractions and oral implantology. However, it is still better to use the conventional techniques at sites that have high bone density areas such as the lower third molar region or for more invasive surgical procedures.

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Immediate loading of dental implants: a retrospective study

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Background: Over the last decade, the concept of immediate loading has gained attention. Immediate loading of implant-supported restorations is a predictable procedure, as testified by recent consensus reports and systematic reviews. This concept is defined as the application of a load by means of a functional or a nonfunctional restoration within 48 h of implant placement. The principal factors associated with the clinical application were protocols aimed to improve and maintain the primary stability of implants, the introduction of osseoconductive implant surfaces to promote improved levels of osseointegration, and to understand better controlled functional loading.

Aim: The aim of this retrospective study was to assess the survival rate of immediately loaded implants in a private dental clinic.

Methods: This study was conducted in our dental clinic between November 2004 and March 2012. A total of 329 implants (238 Swissplus-Zimmer Dental, 20 Xive-Dentsply Friadent, 71 Bluesky-Bredent) were placed on 152 patients (92 females,, 60 males, 21–90 years old) and loaded immediately. All immediately loaded implants were placed with minimum torque of 35 N/cm^2. TThe diameter and length of implants were 10–16 mm and 3.3–4.7 mm respectively. One hundred and nineteen implants were placed in fresh extraction sockets. One hundred and eighty-two of the total implants were loaded functionally and 147 were loaded nonfunctionally.

Results: During the 88 months of follow-up, 12 immediately loaded implants have failed. Nine of these were loaded functionally and three were loaded nonfunctionally. Five lost implants were placed in fresh extraction sockets. The survival rate of immediately loaded implants was 96.35%, functionally loaded implants was 95.05%, nonfunctionally loaded implants was 97.95% and implants in fresh extractions sockets was 95.79%.

Conclusions and clinical implications: Immediate loading of implants showed high survival rates regardless of implants type, loading type, length and diameter. Well-controlled long term clinical studies with large sample size are necessary to confirm this findings. As immediate loading reduces the treatment time and could offer more comfort to the patient, this treatment modality is recommended as an alternative to conventional loading.

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Comparision of cumulative survival and success rates of various implant systems with SLA surface

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Background: In many studies, rough surfaced implants have been reported significantly higher success rates compared to the implants with smooth surfaces. The SLA (Sand-blasted, Large grit, Acid-eched) surface is a kind of "moderately rough surface", which is regarded as an optimal roughness for bone response. However, there have been few available studies which compared clinical outcomes between different manufactures.

Aim: The aim of this study is to evaluate cumulative survival rates and success rates of three different manufacturer's implant systems (Straumann AG: group S, Thommen Medical AG: group T, Dentium: group D) with SLA surface and additionally to investigate factors significantly contributing to implant failure, such as diabetes, smoking, periodontal status, dimension of implant, position and reconstructive procedures.

Methods: Standardized data collection was performed including treatment records and radiographs of patients with SLA surfaced implants placed at the Department of Periodontology, Dental Hospital of Kyung Hee University, Korea, between January 2005 and December 2009. Total 489 patients were identified and 1063 SLA surfaced implants (group S: 191, group T: 443, group D: 429) were placed in these patients. Implants remaining in the maxilla or mandible without any complications were considered as survived implants. The life table analysis was used to estimate survival rates. Cox proportional hazards regression analysis was carried out for the evaluation of various parameters.

Results: In the present study, 6-year cumulative survival rates of the evaluated SLA implants were 98.0%(Group S), 99.6% (Group T) and 96.5%(Group D). Six-year cumulative success rates were 97.5%(Group S), 98.8%(Group T) and 94.9%(Group D). Implant system was not an independent risk factor for implant survival and success in Cox proportional hazards regression analysis. No statistically significant differences were found between all variables in survival rate of SLA implants. When implant success was set as a dependent variable, diabetes (Odds Ratio [OR] = 4.03; $P = 0.027$), periodontal status (OR = 5.68; $P = 0.010$), position of implant (maxilla vs. mandible) (OR = 0.259; $P = 0.038$) and guided bone regenera-

tion procedure (OR = 2.35; P = 0.024) showed statistical significancy.

Conclusions and clinical implications: In this study, three different SLA surfaced implants have demonstrated excellent survival and success rates, regardless of manufacturers. Diabetes, periodontal status, position of implant (maxilla vs. mandible) and guided bone regeneration procedure could be significant parameters for implant success.

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Narrow flapless immediate loaded implant for over-dentures: a 2 years follow-up study

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Background: The employment of narrow implants could aid the clinician in the use of flapless technique in moderate atrophy. This procedure may be indicated especially in elderly patients to reduce the surgical timing and the entity of intervention.

Aim: the purpose of our work is to evaluate the implant survivor rate of narrow immediate loading implants, placed with flapless technique for dental rehabilitation with over-dentures.

Methods: Nineteen consecutive fully edentulous patients wearing removable total prostheses, asking for immediate prosthesis stabilization with a minimal surgical intervention were recruited. Eighty-eight one-piece implants with 2.4 diameter and 10–17 long, 47 on mandible and 41 on upper jaw, were placed with flapless technique and immediate loaded with the previous denture. After a 2 years follow-up the survival rate was evaluated and the results were statistically processed. The clinical complications occurred during the follow-up were also evaluated.

Results: The overall implant survival rate was 87.5%, distinguished in 97.9% for mandible and 75.6% for maxilla, with a statistical significant difference (Fisher exact p, one-tailed P = 0.0017).

Conclusions and clinical implications: The use of narrow implant may be considered an alternative to the standard implants for over-denture retention in mandible, while it seems not to be reliable in upper jaw rehabilitation. Moreover, these implants are useful for stabilization of dentures in the provisional phase of treatment. This issue needs to be focused with longer follow-up.

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The early change of soft tissue around single maxillary anterior implant after immediate placement and immediate restoration

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Background: Immediate placement and immediate restoration have the advantage of shorten treatment duration, but in some cases have the disadvantage of esthetic complications, especially in anterior maxilla.

Aim: To evaluate the early change of soft tissue around single maxillary anterior implant after immediate placement and immediate restoration, and to provide evidence and reference for esthetic consideration.

Methods: Twenty-four patients with 30 failing teeth who need immediate placement without GBR for single upper anterior tooth are included in the study. Plaque index, sulcus bleeding index, papilla index score of the implant site are measured immediately postoperative, 3, 6 and 12 months after operation. The questionaire of the patients satisfaction on aesthetic efectiveness had also been collected.

Results: After the observation for 12 months, all the implants are osseointegrated well. The differences are not statistically significant between groups. The patients were satisfied with the esthetic efectiveness of implant suppported restorations.

Conclusions and clinical implications: Immediate implant placement could shorten the treatment period and reserve soft and hard tissue to a degree. However, due to the inevitable recession of soft and hard tissue, indication should be included strictly, and experienced surgeons are recommended.

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A stepped approach to esthetically restore a failing central incisor

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Background: Treating the esthetic anterior region with implant supported restorations can be a challenging task. Missing teeth lead to missing hard and soft tissues creating esthetically compromised areas. Immediate implant placement and/or immediate restoration can be an unpredictable procedure.

Aim: The purpose of this poster is to present a detailed stepped approach to functionally and esthetically restore a failing central incisor with no periodontal involvement. This

stepped approach is a standardized procedure presented as an alternative to immediate placement, function or loading.

Methods: A 35 year old female patient presented with a broken central incisor (#11). The tooth had an old failing endodontic treatment. The root was extracted and ridge preservation, using FDBA and a resorbable membrane was performed. A partial coverage Rochette-type bridge was used to temporarily restore the missing tooth. At 4 months the bone volume of the augmented site was adequate and an implant was placed. A two stage approach was selected and the implant was covered with soft tissue for the osseontegration period. At 4 months the implant was uncovered and a simultaneous soft tissue augmentation using a connective tissue graft was performed. The palate was used as a donor site. Three weeks later a provisional screw retained implant crown was inserted. The provisional crown was utilized to enhance tissue maturation and scalloping by consecutive modifications that created the desired emergence profile in a period of 3 months. The emergence profile was captured via a customized impression procedure. A custom all-ceramic abutment was constructed. A zirconia reinforced all-ceramic crown was used to create the final esthetic result. The following clinical parameters were evaluated: (1) Biological response of the soft tissue and (2) Esthetic outcome in the cervical region.

Results: A stepped approach for restoring the challenging esthetic areas can be very predictable. The dentist can progressively develop the site to accommodate the implant in a perfect position. The interim restoration can be utilized to create the ultimate emergence profile and to allow the patient to evaluate its shape, size and color. All these information will be used by the laboratory in the construction of the final restoration.

Conclusions and clinical implications: The stepped approach described here allows the dentist to create an optimal result in esthetically challenging cases. The patient has ample time to evaluate the final result via the interim restoration and make his/her comments. The drawback of this procedure is the extended period of treatment, although the patient has constantly a fixed and esthetic restoration to accommodate his/her needs.

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A new technique for chin bone graft harvesting

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Background: The chin is a very common donor site for autogenous bone grafts; however, it also involves donor site morbidity. Chin graft morbidity involves impaired sensibility in the frontal teeth, the gingival and skin postoperatively.

Aim: This prospective controlled clinical trial present and evaluated a useful technique for chin access using a midline mandibular access and bone graft harvesting with trephine drill.

Methods: A total vertical soft tissue flap was performed over the mandible bucal midline starting 5 mm under the free gingiva limit and finishing in the posterior limit at the orbicularis oris muscle. The bone block was removed with 8 mm diameter trephine drill positioned parallel to the mandible base respecting anatomical limits. Postoperative sensibility in mental nerve area was registered with esthesiometry (Semmes-Weinstein Monofilament Kit) in 15 Points measured before and after surgery (3, 7 and 15 days).

Results: There was no paresthesia for the 15 points assessed for all patients. All patients could receive an implant in the correct three-dimensional position.

Conclusions and clinical implications: The midline vertical surgical access showed no mental nerve morbidity for this sample. Harvesting bone with trephine drill proved quick and easy.

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Ridge augmentation with Ti-mesh and autogenous bone grafts. A 88 months retrospective study on 13 patients

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Background: The replacement of missing teeth with dental implants has become a predictable treatment for patients who are totally and partially edentulous. An adequate amount of bone all around implant surface is mandatory in order to obtain long-term success of implant restoration. Alveolar bone volume could be augmented by means of a useful technique described firstly in 1959 by Hurley et al., commonly known as guided bone regeneration (GBR), and then applied in oral surgery by Simion M and Dahlin C.

Aim: The aim of this paper is to present a 87.6 months follow-up of implant restoration after alveolar bone augmentation with Ti-mesh in combination with autogenous bone chip grafts.

Methods: A total of 13 patients were selected to be treated for alveolar ridge reconstruction prior to implant placement. The patients underwent a tridimensional bone reconstruction by means of the Ti-mesh (KLS Martin, Tuttlingen, Germany) filled with autogenous bone harvested from an intraoral region. After a 6 months healing period, the second surgical step was performed to remove the Ti-mesh and to place implants in a prosthetically guided position according to the surgical stent. No complications occurred during the healing period. In one patient the early Ti-mesh exposure after 4 months healing, was managed with chlorhexidine for 2 months. In all patients the amount of newly formed bone was enough to place implants in the ideal position. All cases were restored with fixed restoration. Panoramic X-rays were

performed after implant placement and during the follow-up recalls every 12 months. A software (SketchUp, @Last Software, Inc.) was used to measure mesial and distal peri-implant bone loss during the follow-up.

Results: The mean follow-up was 87.6 months with a range of 12–168 months. The mean peri-implant bone loss was 1.48 mm on the mesial side and 1.54 mm on the distal side from the top of the implant head to the first visible bone-implant contact.

Conclusions and clinical implications: The survival rate at the most recent follow-up was 100% with a mean peri-implant bone loss of 1.51 mm. This technique may offer a predictable alternative for the reconstruction of ridge deficiencies for implant placement without going through major resorption.

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Reconstruction of an edentulous maxilla with zircon bridge supported on eight implants-3 stage approach

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Background: A 56 year old man underwent reconstruction of an edentulous maxilla with zircon bridge in three stages. One stage multiple extraction of residual teeth and immediate dental prosthesis preparation. Two stage-main surgery phase-bilateral sinus lift with window technique, enucleation of cyst in maxilla on the right side, filling up these three spaces with biomaterial mixed with blood of the patient and finally insertion of eight implants. Three stage after 8 months of healing implant-prosthetic procedures were implemented according to two phase implants with cementation of a permanent zircon bridge.

Aim: Present the result of a stage treatment of teeth restoration on one case.

Methods: Material: one patient, 56 year old man. Methods: radiological examinations, sinus lift-window technique, biomaterials, implant-prosthetic procedures according to two phases implants.

Results: In every stage of the treatment the healing process ran without complications. A great result, both aesthetic and functional was achieved.

Conclusions and clinical implications: Maxillary sinus floor-augmentation techniques are frequently used to increase the bone volume in the posterior edentulous maxilla to enable placement and integration of dental implants. In this case Cerabone-Granulate was used as the grafting material. It seems that the use of this grafting procedure is safe and predictable and should become a routine in such cases.

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Reconstruction of an edentulous mandible with a fixed bridge on four implants with the use of profile implants-case report

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Background: The poster presents the result of a reconstruction of missing teeth in mandible within two main stages. A patient received full-arch fixed porcelain bridge supported by two distally tilted implants and two anterior axially inserted implants.

Aim: Present the result of a stage treatment during reconstruction of missing teeth in mandible with use all-on-4 idea combined with a new project of AstraTech-OsseoSpeed Profile implants.

Methods: Material: one patient, woman. Methods: radiological examinations, all-on-4 idea, osseospeed and profile implant-AstraTech, implant-prosthetic procedures according to two phase procedure.

Results: All the procedure was performed according to two phase implants procedures. During the first stage of treatment a temporary complication occurred – swelling of the front part of the mandible. It was treated with steroids. In the next phases complications did not occur. A great result, both aesthetic and functional was achieved.

Conclusions and clinical implications: Although, we can expect many complications in such a treatment, one of them being bone loss around implants. It should be considered to introduce a sloped shoulder implant in a tilted position in these kind procedures. They are more adapted to the bone anatomy and maintain a marginal bone around the shoulder. Thus, the use of a sloped implant in a tilted position seems to be safe and predictable method of bone preservation.

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Outcomes of two implants with different interfaces and neck configurations: randomized, controlled, split-mouth trial

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Background: Peri-implant bone loss seems to occur following implant placement/loading regardless of all the efforts to eliminate it. Several factors, including surgical trauma, biologic width establishment, lack of passive fit of the superstructures, implant-abutment microgap and occlusal overloading may increase peri-implant bone loss. Over the years, new interface

designs were introduced and clinical studies suggest that internal conical connection and platform shifting may be advantageous for marginal bone preservation.

Aim: To compare clinical and radiological outcomes of two implant designs with different prosthetic interfaces and neck configurations in a randomized, controlled, split-mouth, clinical trial.

Methods: Thirty-four partially edentate patients randomly received at least one internal conical connection with back-tapered collar and platform shifting design (NobelActive, Nobel Biocare AB, Göteborg, Sweden), or external hexagon implants with flat-to-flat implant-abutment interface (NobelSpeedy Groovy, Nobel Biocare AB, Göteborg, Sweden). A total of 88 implants were placed in the posterior mandible, according to the split-mouth study design (44 implants with conical connection design and 44 external hexagon implant-abutment complex). Fifty-two implants were placed in the molar and 36 implants were placed in the premolar area. Primary endpoints was peri-implant bone levels changes at different timepoints, failures of implants and/or prosthesis, any complications, ISQ values at implant placement and at prostheses delivery, and periodontal parameters.

Results: No drop-out occurred. Marginal bone changes were statistically significant difference with better results for the internal conical connection. No implants and prostheses failures have been observed, yielding a cumulative survival rate of 100%. A high ISQ value was found for both implants, and no statistically significant difference was found for ISQ mean values between interventions at each time-point ($P > 0.05$). All implants showed no bleeding on probing and a very slight amount of plaque at the 1-year-in-function visit.

Conclusions and clinical implications: Both investigated implant investigated performed similarlyin terms of failure rates, providing successful results up to 1 year after loading. The back-tapered neck configuration with conical connection and built-in platform shifting showed statistically lower marginal bone remodeling than straight neck configuration with flat-to-flat implant-abutment interface and external hexagonal connection.

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Mandibular and implant reconstruction of severe atrophic mandible in an oromandibular dystonia patient

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Background: Oromandibular dystonia is characterized by intense and involuntary spasms of the orofacial muscles, with subsequent loss of dentition and occlusal alteration that worsens the dystonic condition and leads to atrophic edentulism in later stages. The prosthetic rehabilitation of an atrophic unstable mandible is impending not possible and unsatisfactory. An augmentation in severe atrophic mandible is also challenging.

Aim: This presentation reports a case of a severely resorbed edentulous mandible related to mandibular dystonia in which the mandible was augmented with interpositional bone graft and implant rehabilitation.

Methods: A 54-year-old Thai female patient had problems of impairment in masticatory function with hyper movement of the mandible and instability of mandibular dentures. The clinical and radiographic examination showed aflat edentulous arch with approximately 4-mm of bone height posteriorly, 6-mm of bone height anteriorly and partial edentulous posteriorly in the maxillary arch. A series of treatments were planned and offered to the patient to restore function and alleviate dystonia symptoms. Treatment consisted of correction of the severely resorbed mandible with interpositional bone grafting harvested from posterior iliac bone then vesibuloplasty with a mucosal graft from the buccal mucosa and rehabilitation with osseointegrated implants with five Ankylos implants and Syncone abutments for implant-supported prosthesis. Maxillary anterior teeth were extracted and the right canine and left premolar were kept for overdenture construction.

Results: The patient was followed for 4 years after implantation, after 2 years dystonia had disappeared and she no longer took drugs, and 4 years after implantation there was no sign of bone resorption around the dental implant. The average bone height of the mandible was 12 mm and stable. Unfortunately, there were signs of a flabby ridge on the upper anterior ridge, otherwise, the treatment outcome was very predictable and satisfying.

Conclusions and clinical implications: In conclusion, interpositional bone grafts together with implant rehabilitation could be a suitable choice in severely resorbed mandibles and stable occlusion with prosthesis rehabilitation is important in assisting a stable mandibular position and muscle rest, which could resolve the problem of dystonia.

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Peri-implant diseases: prevalence and risk factors

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Background: The use of osseointegrated implants as a basement for the prosthetic replacement of missing teeth has become whidespread in the last decade. Most of the studies indicate that the success of dental implants is 95–97% (Zarb et al., Lindsay et al.). Despite the high success rate, part of a functioning implants is being lost. What factors can lead implant loss?

Aim: To describe the prevalence and risk factors of peri-implant diseases including peri-implant mucositis and peri-implantitis.

Methods: A MEDLINE search (PubMed) was conducted and work published between December 1990 and December 2011 in English language was included in the review. 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. Thirty-eight studies full-filled the criteria and were included to the review.

Results: Two cross-sectional studies report that peri-implant mucositis occurs in 72–93% of the implants inserted. The prevalence of peri-implantitis in three cross-sectional and four perspective studies was reported to be 1–27.4% of the implants. Five controlled clinical trials showed that eriodontitis patients are 2.6–5 times more prone to have peri-implant disease as compared with non-periodontitis patients. Very bad oral hygiene was highly associated with peri-implantitis with an OR = 14.3; CI (2.0–4.1); 95%. For patients with poor oral hygiene, the amount bone loss smokers had nearly three times more as compared with non-smokers. Eleven studies report on the frequency of peri-implant disease in smokers and non-smokers. The results show that smokers are at higher risk to develope peri-implant disease. Cement remnants in the sulcus of the implant in 84% of the cases causes periimplantitis.

Conclusions and clinical implications: Studies, providing data on prevalence of peri-implant diseases, report different results: perspective studies show higher prevalence (27.4%) of periimplantitis among the implants that are in function for about 5 years while cross-sectional studies show that the longer (>10 years) implants are in a function, the higher probability of periimplantitis (24.8%) and periimplant mucositis (93%) is. The review identified strong evidence that poor oral hygiene, a history of periodontitis and cigatette smoking are risk factors for peri-implant diseases. Future prospective studies are required to confirm that genetic polymorphism, alcohol consumption and diabetes are true risk factors for periimplant diseases.

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A literature review on study protocols in implant dentistry

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Background: A diverse variety of study protocols is applicable in implant dentistry. As the choice of study protocols might influence outcome, it is important to know which protocols are regularly applied.

Aim: To analyze the preferred loading protocols of three major implant manufacturers (Astra Tech [AT], Nobel Biocare [NB], Straumann [ST]) and the baseline chosen for radiographic assessment.

Methods: The research included a review of clinical articles written in English on dental implants from peer-reviewed journals listed in MEDLINE published from January 1995 to May 2011. The inclusion criteria were: (1) 10 patients or more (2) all patients followed 1-year or more (3) x-rays of marginal bone (4) 2-piece implants with a non-turned surface (TiOblast/OsseoSpeed, AT; TiUnite, NB; SLA/SLActive, ST). Results were calculated on study group level, meaning that publications reporting, for instance, on two loading protocols were split into two study groups for the analysis.

Results: The search yielded 12,880 publications. Fifty publications (1560 patients, 3941 implants) reporting on AT, 72 articles (2772 pat., 7055 impl.) on NB and 51 (2033 pat., 3840 impl.) on ST met the inclusion criteria. Concerning the loading protocol, in 16% of AT-, 42% of the NB- and 16% of ST-studies implants were immediately (within 48 h) restored/loaded; whereas in 8% of AT-, 17% of NB- and 39% of ST-study groups early loading (later than 48 h up to 3 months), was applied. In 74% of AT-, 31% of NB- and 27% of ST-study groups, implants were loaded 3 months and later. The remainder was not exactly specified. Implant insertion as baseline for X-ray assessment of marginal bone level changes was chosen in 33% of AT-, 62% of NB- and 54% of ST-groups studied. For 54% of AT-, 22% of NB- and 34% of ST-study groups a later point in time (e.g. loading or prosthesis insertion) was applied. In some cases the baseline has not been clearly defined.

Conclusions and clinical implications: Both radiographic baseline and loading protocols differed substantially between implant brands. Not only loading protocol may have an impact on study outcome, but the choice of time-point to serve as radiographic baseline will greatly influence results, since a late baseline will not reflect the typically pronounced initial marginal bone remodelling. Transparent reporting on radiographic data, including the entire treatment time, is essential to report total bone level change and compare radiographic data between studies.

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Comparison between virtual and real position, using cone morse implants in bimaxillary guided surgery

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Background: Nowadays it's growing the number of surgeries that are planned and executed using softwares and surgical templates, the so called guided surgery. However, there aren't enough information and researches about the accuracy of those procedures, comparing the planning and the final position of the implants and observing the differences between maxilla and mandible.

Aim: It is proposed in this study to compare the virtual to the real position of osseointegrated cone morse implants placed in bimaxillary edentulous jaws, and check if there was a difference between implants placed in maxilla and mandible.

Methods: A group of seven edentulous patients, five men and three women, age between 50 and 75 years, were submitted to implant placement in both jaws, in a total of 85 implants, 35 in the jaw and 50 in the maxilla. Sharp apex cylindrical implants were used for mandibles and compacting apex cylindrical implants for maxillas. To compare the implants position it was used two Cone Beam Computed tomography for each patient. The first one was used for planning using Dental Slice software, and the second one to compare the results obtained after surgery. In each implant it was identified three points, coronal (D1), center (D2) and apical (D3), drawing a line between them, obtainning an angle of divergence (A1).

Results: Greater discrepancy was observed in maxilla (A1 = 3.23°, D1 = 1.67, D2 = 2.29, D3 = 3.4) compared to implants placed in mandibule (A1 = 2.95°, D1 = 1.15, D2 = 1.34, D3 = 1.65). The 15 mm lenght implants placed in maxilla had greater tendency to shift planned position.

Conclusions and clinical implications: The conclusions are that the discrepancy between planned and executed implant position is within parameters described in international literature; there was greater variation in maxillary placed implants; and greater lengths implants had increased shifting position.

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Prospective clinical study of immediate loaded implants with different designs

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Background: According the literature, immediate loading procedures in fully edentulous mandibles have been resulting in excellent success rates. However, there isn't a surgical and prosthetic consensus to it.

Aim: This clinical prospective study aimed to evaluate primary and secondary stability of different implants design submitted to immediate loading rehabilitated with hybrid inferior fixed prosthesis with or without a metal framework (screw retained, fixed hybrid bridge).

Methods: Four groups of patients randomly divided were followed: (A) seven patients with external hexagon (EH) implants and rigid bar; (B) eight with EH implants and non-rigid bar; (C) seven with internal cone connection (IC) and rigid bar; (D) III. Seven with IC implants and non-rigid bar. All patients were treated with five implants installed between the mental foramens (115 implants) and the final bridges were delivered from 24 to 48 h after the surgery. Primary stability was measured by values of resonance frequency analyses (ISQ) and final torque (Ncm) from the surgical wrench. Third five Ncm and 55 ISQ were the minimum values established for immediate loading procedures. All groups were evaluated in three periods: (T0) after implants installation; (T4) 4 months after; (T8) 8 months of follow up. Standardized radiographs (with an index screwed over the abutments) were performed to assess periimplant crestal bone level from T0 to T8.

Results: There wasn't correlation between the two forms of primarily stability measurement (Torque vs. ISQ), regardless of the implant and bridge types (Pearson Test; $r = -0.07703$; $P = 0.41$.). ISQ mean values statically alike for all groups, independent of the period of evaluation, also for the values of inflammation and mobility. The four groups of implants presented 100% of success over time. EH implants resulted in an average of vertical bone loss of 0.89 mm and IC implants had an average of 0.53 mm after 8 months, there were a statistically significant difference between groups (Student t, $P < 0.05$).

Conclusions and clinical implications: Both implants EH as IC offer a safe and successful therapy for edentulous patients overall. ICimplant/abutment connected implants presented less vertical bone loss after 8 months of follow up. The two ways of measuring primarily stability have not shown a correlation and both are acceptable parameters for determining immediate loading procedures or not. Either the use of implant supported and retained complete dentures with or without metallic are practicable options for the treatment of edentulous lower jaws.

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Tomographic analysis of implants with immediate loading post extraction area aesthetics – clinical report of 10 cases

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Background: The rehabilitation with endosseous implants is safe and predictable. However, the treatment time is still a limiting factor for patient satisfaction. The implant placement immediately post tooth extraction has been used and has many advantages, especially with regard to aesthetics and lower marginal bone loss.

Key words: dental implants, immediate loading, osseointegration

Aim: The objective of this study was to present clinical cases of implant placement in the sockets, flapless, using provisional activation and production of immediate non-functional for the optimization of aesthetics.

Methods:

Were performed 10 clinical cases of implant placement immediately post tooth extraction:

Results: The results demonstrated the maintenance of periimplant tissues, the presence of interproximal papilla, absence of inflammation, bone loss and good aesthetic negligible after 12 months of evaluation.

Conclusions and clinical implications: The authors concluded that flapless surgery for implants placed in sockets of extracted teeth is an acceptable approach in *implant-supported prosthesis* when consideringthe conditions that influence the aesthetics.

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One stage or two stage implant placement which one has less bone loss?

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Background: Bone loss around dental implants is one of the most important subjects. There are many papers that have been investigate in this issue with controversial results. one of the important factors that may be effective in crestal bone loss is the method of surgery one stage or two stages.

Aim: The purpose of the present study was to compare the crestal bone loss around implants placed according to either a 1-stage or 2-stage implant installation procedure using a digital subtraction radiography technique.

Methods: In the present randomized clinical trial, screw-shaped tapered implants were inserted in the posterior mandible of patients needing fixed partial dentures. In each edentulous area, according to the randomization table, one implant was inserted using a 1-stage procedure (group 1) and one was placed using a 2-stage approach (group 2). The implants were temporized with the relined denture after 2 weeks. All implants were functionally loaded with fixed partial dentures after 3 months. Crestal bone loss (primary outcome variable) was measured using a digital subtraction radiography technique. Standardized radiovisiographs were taken after implant insertion, after fixed partial denture installation (3 months after surgery), and after 6 and 12 months of functional loading. The data were analyzed using the Wilcoxon signed ranks test ($\alpha = 0.05$).

Results: Eleven patients (mean age 46.9 years, three women and eight men) were included in the study. A total of 34 implants were inserted, 17 using a 1-stage protocol and 17 using a 2-stage protocol. Three months after implant placement, the 2-stage implants showed significantly more crestal bone loss (0.65 ± 0.71 mm) than the 1-stage implants (0.41 ± 0.53 mm; $P = 0.02$). However, after 6 and 12 months of functional loading, both groups showed comparable changes in bone level ($P > 0.05$).

Conclusions and clinical implications: No differences were found between 1-stage and 2-stage implant placement in crestal bone loss after 1 year of functional loading.

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Long-term follow-up of 227 ITI-implants after 16–22 years

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Background: Dental implants play an important role in replacing lost teeth and restoring masticatory function. Nevertheless clinical studies examining a high number of dental implants over more than 15 years are rare.

Aim: The aim of this clinical study was to evaluate long term success and survival rates of the ITI implant system 15–20 years after implant placement, incidence rates of periimplantitis and quality of life.

Methods: A total of 368 ITI implants inserted in 78 patients between 1988 and 1999 were screened. A total of 227 dental ITI-implants in 53 patients were included. The mean observation period was 16.8 years. Probing pocket depth, bleeding on probing, recessions and radiographic bone loss was measured. Periimplantitis was defined as probing pocket depth >5 mm. Long-term implant success and survival rates were quoted using the Kaplan Meier method.

Results: No implant was lost due to material deficiency. The survival rate was 92.8% after a mean of 16.8 years. The incidence of periimplantitis at the recall examination was 27.3%.

Conclusions and clinical implications: The survival rates of the ITI-implant system after a mean of 16.8 years is over 90% indicating the benefit for the patients even after such a long interval. Nevertheless complications like periimplantitis – reducing life quality – occur in a substantive number of patients. Patients and clinicians should be aware of that fact.

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Reconstruction of the partially edentulous posterior maxilla in periodontally compromised patients

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Background: Implant therapy involving the posterior maxillary region in partially edentulous patients may involve great difficulties due to the often severely reduced bone volume and the presence of a large maxillary sinus cavity, a problem which is

perpetuated in periodontally compromised patients. These unfavorable conditions are further compounded by the observations that osseointegration is less frequently achieved in the maxilla compared with the mandible, probably owing to the inferior quality of the bone in the posterior maxilla with its thin cortical bone layers and large cancellous structures. However, a considerable number of clinical studies and case reports have been presented which describe methods for circumventing some of these problems through the use of sinus membrane lift procedures, usually in conjunction with bone grafts of different types.

Aim: This case report will show the clinical outcomes of the use of implants inserted in the maxillary sinus following a sinus membrane lift in periodontally compromised patients.

Methods: Patients included in this report comprise two patients, who came to the Chonbuk National University Hospital, Department of Periodontology, because of the tooth loss and hypermobility in the posterior maxilla, having alveolar bone resorption of maxillary posterior edentulous region and advanced pneumatization of maxillary sinus. All patients were treated with sinus floor elevation procedures, which included presurgical evaluation, surgery, post-surgical care, maintenance care, and follow-up examinations.

Results: Radiographs showed no bone loss at 1–3 year follow-up. There was no inflammatory sign or loss of implant stability.

Conclusions and clinical implications: The present report has demonstrated that dental implants can be extended into the maxillary sinus following a sinus floor elevation procedure in patients with a previous history of periodontitis and be stable for a 1–3 year follow-up period. Sinus lift technique can be used successfully in periodontally compromised patients.

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Immediate implant placement into fresh first maxillary molar extraction sockets

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Background: Immediate implant placement after tooth extraction has a predictable outcome in many clinical situations. However, upper molar sockets may represent an additional difficulty due to the poor bone quality of the septum area.

Aim: The aim of this present study was to assess the predictability of immediate placement of implants into first maxillary molar fresh extraction sockets, using a modified insertion technique in conjuntion with regenerative procedures.

Methods: Twenty-five patients with a total of 25 maxillary first molar scheduled for extraction were included in this study. Following tooth extraction with minimum amount of mechanical trauma applied to the surrounding bone, tapered implants with external connection were immediatly placed into the sockets at the inter-radicular septum. Implant platform was keep 1.5 mm apical to the buccal ridge. Guided bone regeneration procedures were performed to fill the peri-implant horizontal gap and a resorbable collagen membrane was used to stabilize the clot and the biomaterial (zenograft). After 4 months of healing period, implants were restored with single crowns.

Results: All implants were monitored for 12 months and only one implant failed during osseointegration. Implant survival rate was 96%. Bone loss measurements show probing depth average lower than 3 mm.

Conclusions and clinical implications: The findings of this prospective study showed that the combination of atraumatic extraction of the first maxillary molar with root separation and the use of appropriate regenerative materials at the time of implant placement represents a predictable long-term treatment.

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Effect of three surgical approaches for implant placement on the crestal bone height

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Background: Post restorative reductions in crestal bone height around endosseous dental implants have long been attributed to be a normal consequence of implant therapy involving two-stage implant systems. When dental implants are placed after reflecting soft tissue flaps there is generally some bone resorption. This is actually attributed to the fact that the blood supply to the bone around the implants is decreased after flap elevation and thus increasing the amount of crestal bone loss.

Aim: This study was conducted to evaluate and compare the changes in crestal bone height as well as soft tissue changes around implant placed with conventional flap, mini-incision and punch techniques.

Methods: Eighteen implants were installed in ten patients. Implants were divided equally into three groups. In the first group conventional full flap technique was used to gain access to the implant site. While in the second group mini-incision technique was used. Punch technique was used in the third group. The patients were recalled immediate and 4 months postoperatively for clinical and radiographic evaluation. The crestal bone height was evaluated using Cone Beam CT to detect the amount of bone loss. The data was analyzed statis-

tically to compare the results of all groups throughout the study intervals. data were presented as means and standard deviation values.

Results: The results revealed that the mean of crestal bone loss was 1.11 mm for the conventional flap group while it was 0.3 mm in the mini incision technique group and 0.36 mm for the flapless punch technique group. Accordingly, there was no statistical significance between crestal bone loss in the later two groups throughout the follow up period. However, the average amount of soft tissue recession for the conventional flap group was 1.27 mm while it was 0.6 mm for the flapless punch technique group. Implant success, mobility and bleeding index were similar for all groups at the end of follow up period, while the mean probing depth was slightly higher in the first two groups.

Conclusions and clinical implications: It was concluded that mini incision as well as punch techniques reduces the amount of crestal bone loss, reduces edema, pain and discomfort at the surgical site in comparison to the conventional flap technique. Mini incision technique might preserve the keratinized mucosa. So it is recommended to be the technique of choice in patients with deficient keratinized mucosa

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Multiple implant treatment with Guided bone implant for complete edentulous arch: a case report

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Background: Treantment of complete eduntulous arch is difficult of implant that most edentulous arch has vertical or horizontal bone resorption of residual ridge, lack of resistance of the oral mucosa. On the severely atrophied alveolar ridge, usually delayed implant placement is recommended after the procedure of onlay block bone graft. Guided bone genenration (GBR) using particulate bone is the most popular procedure on dehiscence or fenetration wound with implant installations.

Aim: In the study, we introduce satisfactory results of clinical cases that minimal invasive approach with bone graft of implant for fixed prosthetics in complete edentulous arch of Oral and Maxillofacial surgery, School of Dentistry, Wonkwang University.

Methods: Eight patients (four males, four females), latest follow up date from January 2011 to April 2011, were selected in the study. Average age was 55.2, at least one reconstructed arch were originally complete edentulous arch and they all restore by fixed prosthesis. All surgery was done under local anesthesial and concious IV (intravenous) sedation with midazolam.

Results: For augmenting the alveolar ridges with bone grafts (case 1, 3), adding bone to the sinuses (case 4), and using a combination of these procedures (case 2) generally have been done. Number of fixtures in the maxilla were 48 (9.5 average) and they all planted at the same time. Implant second surgeries were done average 6.7 months later and additional bone graft of other soft tissue surgery were not needed. A 11.3 months average required for final fixed prosthetics adapt. In periods of latest visit, all implants was survived. In case 4, lateral window opening sinus graft on right and left maxillary sinus 7 months before implant first surgery. Number of fixtures in the mandible was 9 average. All cases with ridge augmentation by GBR and planted at the same time when implant first surgery. Implant second surgery was done 4.8 months later average. A 11.7 months required for final fixed prosthetics adapt. One of 36 implant was failed. In case 6, implant fixture mobility was observed during functional period with temporary cementation of provisional prosthetics on mandibular right first premolar placement. It replaced with same length and diameter fixture after removal and bone graft in the socket 2 months later. Two patients (case 6, 7) required soft tissue surgery (FGG).

Conclusions and clinical implications: Esthetics, phonetics, hygiene, and cost considerations will also aid in treatment planning. Fixed prosthesis option is most likely to satisfy the patient's demand in regard to appearance, function, and comfort. methods and positioning of implants, proper GBR and periods of intervals between sugeries lead to satisfactory result ao most 6 years follow up.

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Replacement of severely traumatized teeth with immediate implants loaded immediately

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Background: Most traumatized teeth can be restored with conservative approaches. However, there are many teeth that need to be extracted because of the severe trauma.

Aim: This clinical case series is to show how immediate implant placement and immediate loading can be an approach for the management of such traumatized teeth.

Methods: Fifteen patients with 23 teeth having a dental trauma of which 20 teeth had complex crown and root fractures and three teeth had cervical root fractures were treated. There were not any labial bone fractures. All 23 teeth were extracted and NobelReplaceTM Groovy Tapered implants (Nobel Biocare, Gothenburg, Sweden) were placed immediately in the fresh sockets. They were placed toward the palatal side of the socket and 3 mm below the gingival margins. The insertion torque for all the implants exceeded 35 N. In case of gaps between implants and sockets wider than 1 mm, deproteinized bovine bone (Bio-Oss, Geistlich, Wolhusen, Switzerland) was grafted in the gaps. Immediately after placement the

implants were loaded with a provisional prostheses. The final restorations (ceramic abutments with ceramic crowns over implants) were installed 3–4 months later. The patients were re-evaluated 1–3 years after the final restorations had been placed. Clinical and radiographic examinations were performed.

Results: In all 15 patients excellent functional and esthetic results were achieved. No implants showed radiolucency, peri-implant suppuration, or mobility. The patients were very satisfied with the results.

Conclusions and clinical implications: Compared with delayed implants and delayed loading, the immediate implant technique with immediate loading offers several potential advantages: (1) Quick replacement of the lost tooth. (2) More ideal implant positioning is possible. (3) The opportunities for osseointegration are better owing to the healing potential of fresh extraction sockets of traumatized teeth, which usually do nott have apical lesions. From a clinical standpoint, immediate implant (NobelReplaceTM Groovy Tapered) with immediate loading is an option that provides good treatment outcomes and allows good functional and esthetic results, as well as the addressing the social/psychological aspects for dental trauma.

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The development of implants stability in sinus augmentation

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Background: Initial implant stability obtained immediately after implant insertion is regarded as critical for the prognosis of the implant. Implants with better initial stability would osseointegrate better and would result in higher stability after healing. They would require a shorter healing period than those with low initial stability.

Aim: The purpose of the pilot study is to determine how stability after healing varies according to primary stability in implants inserted in the sinus augmentation. The stability is measured using a resonance frequency analyzer Osstell ISQTM (Integration Diagnostics AB, Sävedalen, Sweden).

Methods: Twelve patients underwent two stage maxillary sinus augmentation using a mixture of β-tricalciumphosphate (Cerasorb® sized 1000–2000 μm, Curasan AG GmbH, Kleinostheim, Germany) with autogenous bone from the maxillary tuberosity in the ratio 5 : 1–8 : 1. Sixteen screw-form implants (Impladent®, Lasak, Prague, Czech Republic) were inserted after 9 months of healing of the graft and followed using implant stability quotient (ISQ). ISQ1 represents the implants stability during implant insertion and ISQ2 represents the values after 6 months of implant healing. Implants were divided into three groups according to their ISQ1 values. Group A includes those implants whose ISQ1 ranges from 71 to 77, group B includes those from 64 to 70, and those implants whose ISQ ranges from 59 to 63 were included in group C.

Results: All implants were successfully osseointegrated. ISQ1 values ranged from 59 to 77 and ISQ2 ranged from 64 to 75. Implants in group A on an average decreased their ISQ from 74.0 to 70.4 during the healing period. Implants in group C increased their ISQ from 60.1 to 64.3. Group B showed no significant change. Regression coefficient was 0.436 andintercept was 38.0.

Conclusions and clinical implications: The coefficient of determination reflects a strong relation between ISQ1 and ISQ2. Thus, stability development after healing of implants inserted into two stage sinus augmentation depends on primary stability. It has been noticed that implants with lower values of ISQ1 (group C) increased their stability and those with higher ISQ1 (group A) decreased their stability during healing. The stability values seem to converge to a medium range stability values during healing period. Therefore, there is no need of a too high initial stability value to secure a better prognosis for the implant. However, the lower limit of the initial ISQ values is yet to be determined.

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A modified method for sinus floor augmentation without grafting: a case series

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Background: Many grafting procedures have been used to establish an adequate bone volume for the placement of endosseous implants in atrophic posterior maxilla. The most common technique is the augmentation of maxillary sinus floor, a technique introduced by Tatum, which is the elevation of maxillary sinus membrane with a lateral approach and stabilization of the membrane with bone grafting materials. Late studies have shown that simple elevation of the sinus membrane and the establishment of a space during implant installation result in bone formation and osseointegration.

Aim: Bone formation after sinus membrane elevation is a novel technique for maxillary sinus floor augmentation. The purpose of this study is to introduce a modified method of sinus floor augmentation perfomed simultaneously with implant installation in which the sinus floor membrane is elevated with a lateral approach and the window is closed with a titanium foil to promote guided tissue regeneration. On the contralateral maxillary sinus, sinus lifting procedure with a grafting material is also performed to allow a comparison of the methods.

Methods: Four patients who required sinus lifting procedures in both sides of the maxilla were included in the study. Twelve Straumann® Bone Level Implants and two Xive® implants were placed simultaneously with sinus lifting procedures. Each patient recieved a sinus lifting procedure on one of the maxillary sinuses where a cortical window was removed from the maxillary anterior sinus wall with the elevation of the membrane and placement of grafting material (Cerabone®) with implant installation and on the other maxillary sinus, a cortical window was removed and following the elevation of the sinus floor membrane, implants were placed and the window was closed with titanium foil (Trinon Titanium GmbH). The remaining bone height was recorded during surgery (5–10 mm). After 4 months of healing, dental volumetric tomographies were taken to evaluate bone formation.

Results: After 4 months of healing, implants were osseointegrated and there were no failures. Abutments were connected and the final restorations were placed. The thickening of the sinus floor membrane was noted where the augmentation of the sinus floor was performed without any grafting materials. Bone density (measured in hounsfield units) was similar around all implants in the coronal and middle section. HU values were higher in the apical section of the implants where bone grafting material was used compared to the no grafting sites.

Conclusions and clinical implications: By not using any grafting materials, the cost and risk of complications such as infection were reduced. Both procedures were successful clinically and radiologically though the long term prognosis is yet unknown.

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Usefulness of ridge expansion and xenograft in atrophic maxilla: case report

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Background: The faciopalatal bone width is often insufficient for implant placement in atrophic maxilla. Autogenous block bone graft may be "gold standard" for increasing buccolingual width in these cases. However, some complications such as donor site morbidity, resorption, and wound dehiscence would be occurred in some cases. Furthermore, it could be time-consuming that need a few months of bone remodeling before implant placement.

Aim: The purpose of this presentation is to report two cases that have been performed ridge expansion and xenograft with simultaneous implant placement in atrophic maxilla.

Methods: In this study, six implants were installed to two patients (patient 1: two implants, patient 2: four implants) who showed insufficient buccolingual bone width. Preoperative cone-beam computed tomography revealed that mean buccolingual bone width in patient 1 was 4.8 mm in premolar area, and 4.4 mm in patient 2 in premolar and molar area. Ridge expansion with osteotome and simultaneous implant installation with regular diameter were performed in both patients. The operator added xenograft (Bio-Oss, Geistlich, Switzerland) material that was covered with biodegradable membrane. The mean period of observation after implant installation was 13 months.

Results: Six among six implants were survived. All the implants achieved good primary stability. There were no significant differences of ISQ between each implant. There was no noticeable bone resorption in clinically and radiographically.

Conclusions and clinical implications: The use of ridge expansion and xenograft could be useful in patients who have buccolingually atrophic maxilla to expand the available bone width before implant placement.

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Implant placement adjacent to ankylotic area in anterior maxilla

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Background: There are several options of treatment for traumatized teeth undergoing root resorption. One of the most predictable is the extraction and immediate implant placement. However, the ankylotic teeth in the process of root resorption may hamper extraction and damage aggressively alveolar entire anatomy, particularly in aesthetic areas.

Aim: To present an alternative solution for implant placement in areas of tooth ankylosis process through the report of a clinical case.

Methods: The surgical technique used was to remove the tooth crown followed by a standard osteotomy for implant placement without total remove of the ankylotic dental root. Followed this procedure, transfer impression was performed and a conventional provisional crown was immediately installed. Six month later, permanent ceramic crown was made.

Results: The case is under 3 years of follow-up. Short and long term stability was observed regarding clinical and radiographic results as well as periimplantar tissue stability.

Conclusions and clinical implications: Respects to surgical principles and biological agents at the immediate implant even in a single case as presented, we can achieve aesthetic and functional satisfaction for the patient.

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Immediate implant placement combined with titanium granules

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Background: The immediate implant placement even in the esthetic zone is an often performed procedure. The position of the implant is closed to the palatal part of the socket. There are different concepts for the management of the remaining gap between the implant and the lingual bone plate.
Aim: The aim is to keep the contour of the alveolar process by using titanium granules as a non-resorbable graft material.
Methods: In this study, the gap was filled up with white titanium granules. Ten implants were placed in the region of the upper incisors. After the placement, a healing abutment in the same diameter as the implant was connected. The granules were mixed with blood and pushed with gentle pressure into the gap. The "small" healing abutment was removed and replaced by an abutment in a diameter corresponding to the replaced tooth. A temporary crown was fixed to the abutment and adhered to the adjacent teeth. After a healing time of 3 months, the abutments and temporary crowns were replaced by definite reconstruction. To evaluate the stability of the alveolar process, clinical pictures were taken before extraction and after the delivery of the final crown. In addition measuring was made using the planning model and the master cast.
Results: The healing period was uneventful in all cases. The restorations showed a healthy gingival margin and no discoloration of the soft tissue. All patients were satisfied with the clinical results so the minimal collapse of the alveolar process as the result of the measuring of the models seems not to result in a compromised clinical situation.
Conclusions and clinical implications: The easy use of the material and the early clinical results justify further use for this indication.

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Reduced diameter titanium–zirconium implants: a human pilot study – 3 year results

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Background: Implants made from a new titanium-zirconium (TiZr) alloy (Roxolid) have shown good osseointegration with no adverse effects in animal studies. This prospective single-cohort case-controlled pilot study was performed to evaluate the performance and safe use of reduced-diameter implants made from this new alloy for the first time in patients.
Aim: Primary: Assessment of implant success and survival rates 1 and 3 years after placement (criteria Buser 1990). Secondary: (1) Change in functional bone level after loading (baseline for standardised periapical radiographic analysis was at time of implant loading); (2) Assessment of peri-implant health after loading (pocket probing depth (PPD), plaque index (PI) and sulcus bleeding index (SBI); (3) Assessment of implant restoration (criteria: stable, functional and asymptomatic).
Methods: In two private specialist clinics, 22 patients each received one Straumann 3.3 mm TiZr test implant with a Regular Neck Standard Plus design. The use was restricted to the indications and protocol for the use of the existing 3.3 mm diameter Regular Neck implant (conventional Grade IV titanium). Subsequently, the test implants were splinted to standard Grade IV titanium Regular Neck or Wide Neck implants (either 4.1 or 4.8 mm diameter) with a fixed dental prosthesis (screw or cement-retained).
Results: Twenty-two test implants were placed in 22 patients. At the 3-year follow up, 20 implants survived; one study implant was lost 80 days after placement due to infection spreading from an adjacent tooth and one patient did not complete the 2 and 3-year assessments due to moving abroad. Mean patient age = 54.4 years (range 22–73 years); 63.6% male, 36.4% female. Of the test implants, 63.6% were placed in the maxilla, 36.4% in the mandible. Mean change in functional bone level for test implants 3 years after loading was -0.31 ± 0.74 mm. Mean pocket probing depths for test implants were 3.1 ± 1.07 mm mesial, 2.75 ± 0.97 mm distal, 2.35 ± 1.09 mm buccal and 2.5 ± 1.05 mm lingual after 3 years. All 20 patients had a stable and functional restoration at 3 years.
Conclusions and clinical implications: Within the limits of this pilot study, the performance of the new implant material was safe and reliable. The new implants meet established success and survival criteria after 3 years.

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Evaluation of sinus floor augmentation using autologous fibrin clot in concentrated growth factors (CGF) as sole grafting material

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Background: Autologous fibrin clot in CGF can be prepared very simply by centrifuging venous blood with the specialized machine. Fibrin and fibrin clots, which are thought to be beneficial for bone regeneration, play an important role in wound healing. By providing a scaffold for cell migration during the tissue repair process, they function as a temporary shield. Furthermore, fibrin also serves as a reservoir for cytokines and

growth factors. In this study we evaluated sinus floor augmentation with simultaneous implant placement using autologous fibrin clot in CGF as sole grafting material.

Aim: The aim of this study was to evaluate the sinus floor augmentation with simultaneous implant placement using autologous fibrin clot in CGF as sole subsinus filling material.

Methods: This study included patients who underwent sinus floor augmentation with simultaneous implant placement using autologous fibrin clot in CGF as the sole filling material at the Department of Oral and Maxillofacial Surgery, Nagasaki University Hospital; nine sinus floor augmentations were performed and 17 implants were placed in six patients. For each patient, pre-surgical and post-surgical (6 months after the surgery) examination using x-ray and CT scan were performed to assess the bone formation around the implant site. Using planning software (Simplant, Materialise Dental), Hounsfield units (HU) of the newly formed bone and the bone height from the sinus floor to the alveolar crest where implants were inserted were measured.

Results: Pre- and post-surgical CT analysis revealed that the mean residual bone height between the sinus floor and alveolar crest was 4.4 ± 0.795 mm (range: 2.8–6.1 mm) and 11.7 ± 1.73 mm (range: 8.9–13.4 mm), respectively. The alveolar bone ridge was wide enough for implant placement in all cases. Mean HU of the newly gained bone around the implants was 319 ± 159.6 (range: 180–713). All implants were clinically stable during abutment tightening at the time of second surgery performed 6 months after the sinus floor augmentation.

Conclusions and clinical implications: Sinus floor augmentation with simultaneous implant placement using autologous fibrin clot in CGF as sole filling material may promote natural bone regeneration.

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One-year results of immediate implant placement and socket preservation procedures

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Background: There is limited evidence to provide recommendations on which are the best techniques/materials to increase clinical outcomes and patient satisfaction in immediate single implant placement/loading in post-extraction fashion.

Aim: To evaluate clinical and radiological changes of immediate single implant placement/loading and socket preservation procedures in aesthetic region 1-year after loading.

Methods: Ten consecutive patients requiring an immediate restoration of a non-treatable upper tooth between premolars were recruited for atraumatic tooth extraction, immediate implant placement/loading according to an appropriate tridimensional bone-to-implant relationship, and ridge preservation procedure with inorganic bovine bone mineral. Outcome measures were implants/prostheses survival rate, bone crest level (BCL) changes, bucco-palatal thickness (BPT) changes and pink esthetic score (PES) at implant placement, and at 1-year follow-up. Implant stability quotient (ISQ) was collected at implant placement and at the delivery of definitive restoration, 6-months later. At the last follow-up visit, periodontal parameters (bleeding on probing and plaque scores) and patient satisfaction were recorded. In addition: adverse events, e.g. biological and mechanical complications.

Results: No implant or definitive prosthesis failed during the entire follow-up. The mean BCL change between implant placement and the last follow-up was 0.34 ± 0.55 mm (P = 0.081). In 5 of 10 cases, the BPT slightly increased, thus the mean change after 1-year was −0.02 ± 0.51 mm (P = 0.918). The mean PES was 8.7 ± 1.49 before tooth extraction and 10.70 ± 1.34 1-year after implant placement/loading, earning an average increase of 2.0 (P = 0.000). A moderate initial ISQ value was found at implant placement (72.35 ± 2.99), then it significantly increased after 6 months (81.20 ± 1.87; P = 0.000).

Conclusions and clinical implications: Immediate implant placement and loading according to the protocol used in the present study provides a viable treatment option for the immediate placement/loading of dental implants in the aesthetic region.

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Anterior teeth immediate implant survival of periodontal disease and risk factors

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Background: Chronic periodontitis is a common disease in middle-age patients. Immediate implant of anterior teeth is often used in periodontitis patients with lower cumulative survival rates so all risk factors should be controlled before implantation to increase the survival rate of dental implants.

Aim: The purpose of this study was to investigate the cumulative survival rates of dental implants placed in a private periodontal practice and the effects of periodontal disease and immediate placement on implant survival.

Methods: A retrospective review was conducted on 186 periodontitis patient received anterior teeth immediate implant-with 5 years follow-up. All the patient had moderate chronic periodontitis and required immediate implant therapy. Before the operation of implant, the patients received the basic periodontal therapy. More than 500 dental implants were placed in the sockets that the anterior teeth were extracted immediately. Clinical and radiographic evaluations were performed during 5 years follow-up.

Results: The 5-year survival rate of immediate implant in periodontitis patient was 95.1%. In general, the survival rate of delay implant is over 96% in periodontitis patient by the

calculation of our hospital. Nearly 80% of implant loosing happened during the first 6 months after the operation of implant. Inflammation is the primary reason of the failure. Patients of implant failure felt more or less pain during the healing period. Peri-implants had infection symptoms: pain, gum swell and even outflow of ichors were observed. About 65% patient of implant failure were tobacco user in our study. Severe smoking was found to correlate with marginal bone loss at implants and teeth. Twenty-three implants of failure were placed in maxilla and only to implants of failure were placed in mandible. The length of all the implants was no less than 13 mm, so the survival rate was no difference between long implants. Longer implants have higher bone–implant contact and a better crown-height/implant-length ratio.

Conclusions and clinical implications: Anterior teeth immediate implant of periodontitis patient had higher risk than delay implant of periodontitis patient. Inflammation was the primary risk that caused the implant loosing. Tobacco use might increase the risk of implant failure, but it was not the definitive factor. Using longer dental implant (>13 mm) might improve the survival rate of immediate implant. Bone quality and quantity were the important success-related factors of immediate implant. Implants placed in maxilla had higher risk of failure than implants placed in mandible.

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Evaluation of an air-abrasive device during surgical treatment of peri-implantitis

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Background: Recent controlled clinical studies have indicated that non-surgical instrumentation does not seem sufficient to control peri-implantitis. Hence, a surgical approach combined to an effective elimination of the oral biofilm from rough implant surfaces might be recommended. Nevertheless, at the moment, no consensus is reported about a more reliable decontamination procedure.

Aim: The aim of this prospective, pilot randomized controlled trial was to evaluate the long term additional benefit of an air-abrasive device (Perio-Flow®) during surgical treatment of peri-implantitis.

Methods: Sixteen implants with moderate to advanced peri-implantitis (4–10 mm) were treated with either a surgical technique combined with carbon curettes, cotton pellets impregnated with saline (MG) or the same procedure plus the use of Perio-Flow® (MDG). Clinical parameters: plaque index, gingival index, probing pocket depth (PlI, GI, PPD) were assessed at baseline (T0), 3 (M3), 6 (M6) and 12 months after treatment. Mean values and standard deviations were calculated for each variable and group using the patient as statistical unit. The unpaired t-test was used for between group comparisons of mean values (PlI, GI, PPD) and the changes in mean values from baseline to 3, 6 and 12 months.

Results: Mean PlI scores remained low (MDG = 0.36 ± 0.19 vs. MG = 0.32 ± 0.29) throughout the entire study period, without showing any significant differences between both groups ($P > 0.05$, unpaired t-test, respectively) Mean GI values were significantly reduced from baseline in both MG and MDG groups after 3, 6 and 12 months of healing ($P < 0.05$; unpaired t-test). However, at 12 months, MDG group revealed a significant difference in mean GI reduction compared to the MG group ($P < 0.05$; unpaired t-test). Both groups also exhibited a decrease in PPD from baseline but this was more pronounced in MDG group than in MG one (MDG = 2.45 mm ± 1.27 vs. MG = 0.64 mm ± 1.48) ($P < 0.05$).

Conclusions and clinical implications: Within the limitations of the present study, both groups revealed a significant reduction of the clinical parameters in favour of the air-abrasive device group regarding gingival index and probing pocket depth. A longer follow-up and a larger number of patients would be needed to confirm these results and the benefit of adding this method of decontamination to the surgical procedure.

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Application of platelet-rich fibrin with deproteinized bovine bone mineral in sinus augmentation: case report

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Background: An autologous platelet- and leucocyte-enriched fibrin matrix called platelet-rich fibrin (PRF) has been introduced as a second-generation platelet concentrate. However, little is known about the adjuvant effect of PRF combined with bone substitute.

Aim: Here we report a case of sinus augmentation using PRF application in combination with deproteinized bovine bone mineral (DBBM).

Methods: The patient was a 49-year-old female. She was referred to our outpatient clinic with the partially edentulous maxilla as a chief complaint. As tooth in 16 and 17 regions were missed, the x-ray and CT examinations showed the vertical bone height between the sinus floor and the alveolar ridge was about 2 mm.

Results: As the informed consent was given, sinus augmentation followed the lateral wall protocol was carried out. PRF was produced using an established technique and the patients' peripheral blood samples were taken at the beginning of the operation. Immediately after drawing blood, the vacutainers were centrifuged at about 300 ***g*** for 10 min. Before coagula-

tion, liquid PRF was collected and mixed with DBBM to produce massive form later, while PRF clot was prepared in membrane form after coagulation. After rising a buccal mucoperiosteal flap, an osteotomy was prepared in the lateral wall of the maxillary sinus with a diamond round bur. After the Schneiderian membrane was carefully elevated, the grafting material was packed into the space between the sinus floor and the Schneiderian membrane. A massive mixture of PRF and DBBM preparation was inserted in the sinus. And then the access window was covered with the PRF membrane before the flap closure. After 6 months of sinus augmentation, bone biopsies by the initial drilling for implant placements were obtained from the grafted posterior maxilla, and undecalcified ground sections were prepared. The histological observation showed that DBBM could have very good contact with newly formed bone while the surface was partly resorbed. Dental implants were placed and the follow-up for 2 months could lead to the healing and the osseointegration. Following the re-entry for gingival forming as a second stage, the provisional restoration was carried for 1 month to observe uneventful condition without any occurrences such as loosing or tipping. The maintenance has been periodically carried out after the final restoration was screw-retained.

Conclusions and clinical implications: Handling of bone substitute is easier than the individual, when it is mixed with PRF. In addition, PRF could be very useful since it could be formed as liquid for mixture with bone substitute or membrane for cover of access window in sinus augmentation. Finally, using the combination of PRF with DBBM, the rehabilitation of partially edentulous maxilla could be successfully performed with dental implants after sinus augmentation.

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Precision of implant placement in edentulous mandibles using different surgical-templates

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Background: By the use of computer-tomograms (CT) in combination with planning-software, the position of the implant can be planned three dimensionally according to the restorative needs. To transfer the planned 3D-restorative driven implant-position in the patient's mouth, surgical-templates fabricated by different techniques are described. Scan-prostheses and drilling-templates are released for the edentulous jaw. However, since the template's anchorage to e.g. implants is not a basic requirement, positioning and stability is challenging.

Aim: The aim of the investigation was the comparison of the precision of design and fabrication of different drilling-templates on the ability for reproduction of the planned implant-position for the edentulous jaw.

Methods: Three different systems are planned to be tested each in 10 radiopaque resin jaw-models with a resilient soft-tissue analog per system: (1) SimPlant (stereolithographic-technology; Materialise, B), (2) CoDiagnostiX (conventional-resin-technology; Straumann, CH) and (3) SKYplanX (CAD/CAM-technology; Bredent, D). For each system 10 CT-scan-prostheses were produced according to manufacturer's recommendation. Four implants (Straumann-RN.; length 10 mm; Ø4.1 mm) in tooth position 34, 32, 42, 44 were planned to be placed by the respective planning-software. For later measurements of implant positions six reference-pins (Ti) were inserted in each jaw-model. A conventional CT-scan with the respective template was made with every model. Virtual measurements of each implant-position ($n = 8$) were performed after the 3D-planning. Afterwards the respective scan-prostheses were converted to drilling-templates (guided surgery, Straumann) followed by 3D-guided insertion of the implants. Final CTs of every model were made and the measurements of the resulting implant-position were measured again. To determine the influence of the different planning and guiding systems on the quality of implant positioning the deviation between the planed pre-operative and the resulting post-operative implant position were calculated.

Results: The mean deviation (Delta) between the virtual-planed and the actual post-operative implant position were analysed for each scan- and template-system: SimPlant (shoulder 0.61 [±0.19] mm/$P = 0.210$ and apex 0.71 [±0.19] mm/$P = 0.215$), CoDiagnostiX (shoulder 0.55 [±0.25] mm/$P = 0.144$ and apex 0.45 [±0.34] mm/$P = 0.233$) and SKYplanX (shoulder 0.37 [±0.14] mm/$P = 0.167$ and apex 0.18 [±0.08] mm/$P = 0.495$). For all systems there were no significant differences between the pre-operativ and the post-operative measurements (mean; $P = 0.267$; Kolmogorow–Smirnow-Test/T-test).

Conclusions and clinical implications: There were differences between the pre-operative and the post-operative implant-position by using the tested systems. SKYpalnX achieved the best results followed from CoDiagnostik and SimPlant. However, the differences between the fabrication-technologies were not significant. Comparing with literature results of this *in-vitro* study do not support the utterly need of additional anchorage of the scan- and drilling-templates in the edentulous jaw. Nevertheless these findings have to be proved clinically.

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Resonance frequency analysis as predictor for early failure in immediate implant placement in molar regions

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Background: Implant stability is a prerequisite for achieving osseointegration, but to gain stability in immediate implant placement can be a challenge. Performing immediate implant

placement in molar regions requires the simultaneous use of a bone regeneration method.

Aim: To investigate the usability of resonance frequency analysis as a diagnostic tool in immediate implant placement in molar regions to predict early failures.

Methods: Ninety-two patients (44 women and 48 men; mean age 50 years [range 23–77]) in need of an implant replacing a molar (45 in the lower jaw and 47 in the upper jaw) were included. After extraction and placement of the implant (Brånemark System Wide Platform), large periimplant defects remained. Having secured that the implant was clinically stable the implant stability quotient (ISQ) was measured at four sites (mesial, buccal, distal and oral) using resonance frequency analysis assessed by Osstell mentor (Integration Diagnostics, Savedalen, Sweden). After that, each patient was randomly allocated to one of three bone regeneration treatments: Autologous bone chips, Ossix membrane (Biomet 3i, Palm Beach Gardens, FL, USA) or a combination of these. Four months after implant placement a surgical re-entry was performed, and the implant was controlled for remaining periimplant defect. The implant was explanted if it had a dehiscence on >2 of four sites (mesial, buccal, distal, oral), and if it had visible threads $\geq$50% of the total implant length on one of the four sites, i.e. failure. Otherwise a healing abutment was connected.

Results: Fifteen implants failed. The mean ISQ in the 77 non-failing implants was 62.7 (range 35–82, median = 64.75), and in the failing implants 48 (range 28–71, median = 48.25). This difference was statistically significant (Wilcoxon's test for non-paired data, $P < 0.001$). Setting the cut-off ISQ value to $\leq$36, in order to maximize the number of failing implants and minimize the number of non-failing implants below the cut-off value, resulted in five failing implants having ISQ-values below the cut-off value and 10 above. For the non-failing implants the respective values were 1 below the cut-off value and 76 above. Thus with a threshold ISQ value of $\leq$36, the positive predictive value for early implant failure was 0.83 (5/(5 + 1)) and the negative predictive value 0.88 (76/[76 + 10]).

Conclusions and clinical implications: Resonance frequency analysis may be an adjunct diagnostic tool when placing implants immediately in molar regions to estimate the risk for an early failure.

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Guided implant surgery using a 2-stage protocol: a prospective clinical outcome study

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Background: CT-scan based guided implant surgery has many advantages in comparison with "open" techniques: a shorter duration of the surgical procedure, less pain and swelling, less bone resorption due to stripping of the bone and a predictable prosthodontic outcome. Literature reports low success rates for implants placed with CT guidance and immediate loading due to linear and angular deviation of the planned vs. the actual implant position. Overall survival rates as low as 89% in the maxilla and 83% in the mandible are reported. A prospective study was undertaken that evaluates the outcome of 679 implants placed with Nobel Guide in completely edentulous jaws using a 2-stage procedure. Patients were wearing a relined denture during the osseointegration period. Using a 2-stage procedure eliminates the bias of implant loss due to immediate loading.

Aim: Answer the question if loss of implants due to linear and angular deviation of the planned vs. the actual implant position is significant.

Methods: A total of 679 implants placed by the author between november 2006 and december 2010 in 159 consecutive patients were evaluated. All implants were placed with Nobel Guide in completely edentulous jaws using a 2-stage procedure, after a double scan with GE Lightspeed CT-scan. A total of 523 Implants were placed in 120 patients (40 men, 80 women) in the upper jaw, 156 implants were placed in 39 patients (16 men, 23 women) in the lower jaw, which means that all patients in the lower jaw underwent an All-on-4 procedure. The minimum follow up after second stage surgery was 9 months. No patients were excluded. Mouth rinse with chlorhexidin was started 3 days before surgery, antibiotics the evening before and continued during 4 days.

Results: Three of 156 Implants (1.92%) were lost in two patients in the lower jaw. Both were heavy smoking women. In the upper jaw, 7/523 implants (1.33%) were lost in six patients. Two Patients (who lost three implants) had extremely soft bone, in four implant losses the cause was unknown.

Conclusions and clinical implications: Loss of implants due to linear and angular deviation of the planned vs. the actual implant position is 4/679 (0.59%) or less. The benefits of CT-scan based guided implant surgery largely outweigh the risk of additional implant loss.

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A within implant comparison to evaluate the concept of platform switching. A randomized controlled trial

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Background: Studies have shown that platform switching helps to prevent bone loss. There are however, several other factors which may affect peri-implant bone remodelling and therefore, may confound the effect of platform switching.

Aim: The purpose of this study was to evaluate prospectively the 1 year bone and soft tissue healing of the platform switching concept applied within the same implant, to exclude possi-

ble confounding factors such as surgical or prosthetic handeling or patient factors.

Methods: Fifteen patients were selected for a randomized clinical trial. Each patient received one customized wide body implant, with the external hex connection located eccentrically, allowing an extra 1 mm switch on one side. The hex was at random positioned at the mesial or distal side and the implant was delayed loaded after 6 months. Patient were examined 3, 6 and 12 months after surgery, during which a radiograph was taken to determine bone loss. At 12 months, the mucosal thickness was measured using a perio-probe.

Results: All implants survived and the mean overall bone loss, calculated from both the switched and non-switched side, was 0.39 mm (SD 0.33, range 0.00–1.45), 0.85 mm (SD 0.59, range 0.10–2.50) and 0.80 mm (SD 0.46, 0.26–1.89) after 3, 6 and 12 months respectively. The bone loss continued up to 6 months but stabilized thereafter ($P = 0.615$). At each time interval, significantly more bone loss was observed at the non-switched side compared to the switched side. The mean mucosal thickness was 4.22 mm (SD 1.45; range 1.50–7.00), and was not significantly different between the switched and non-switched sides ($P = 0.882$). However, with the mean thickness as a threshold, the mean bone loss was only significantly difference between switched and non-switched sides when the mucosa was thicker than 4.22 mm ($p = 0.036$).

Conclusions and clinical implications: The outcome of this prospective study is in accordance with earlier studies that platform switching limits bone loss. Although the sample size was limited, it seems that the creation of a biologic width affects peri-implant bone loss to a greater extent and platform switching will be only effective when the mucosal thickness allows the establishment of a biologic width.

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One piece zirconia or titanium implants placed in posterior mandible: 6 months follow-up

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Background: At present, only few studies with zirconia implants have been evaluated.

Aim: This prospective study evaluated one-piece zirconia implants placed in posterior mandible assessing implant survival rate, implant success, marginal bone loss, prosthetic complications.

Methods: Thirty-seven one-piece implants were divided in two groups: zirconia implants (Zi, $n = 18$ implants) and sand-blasted acid-ecthed titanium surface (SAE, $n = 19$ implants) These implants were insered in partially edentulous mandible of 14 patients in a split-mouth design. At 6-months follow-up, clinical, radiographic and prosthetic parameters were assessed. Success criteria included absence of pain, sensitivity, suppuration, implant mobility; absence of continuous peri-implant radiolucency; distance between the implant shoulder and the first visible bone contact (DIB) <1.5 mm.

Results: After a 6 months loading time, the overall implant survival rate was 94.59%, with three implant losses (2 Zi and 1 SEA). Among the surviving implants (34 out of 37), all fulfil the success criteria; therefore, the implant success was 94.59%. The mean distance between the implant shoulder and the first visible bone contact (DIB) for Zi and SEA implants were 0.34 ± 0.95 mm and 0.43 ± 0.85 mm respectivelly. Few prosthetic complications were reported.

Conclusions and clinical implications: Within the limits of this study, one-piece implants made of Zi or SAE seem to represent a safe and successful procedure for implant-supported restoration, at least, after 6 months follow-up.

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Precision of guided surgery. Determination of influencing factors via a RCT

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Background: Randomized controlled clinical studies comparing the precision of different guided systems and defining influencing factors are lacking.

Aim: This study aims to determine in a RCT setting the precision of the Materialise Universal® system and the Astra Tech® FacilitateTM system (mucosa supported as well as bone supported) in comparison to mental navigation and to pilot drill guidance with a basic surgical guide and to determine the influencing factors on the precision of guided surgery.

Methods: Seventy-two fully edentulous cases were recruited and randomly assigned to one of the following groups: Test group 1a: Materialise Universal®/flapless, Test group 1b: Materialise Universal®/non-flapless, Test group 2a: FacilitateTM/flapless, Test group 2b: FacilitateTM/non-flapless, Control group A: Mental navigation (non-flapless). Another control group B was added: pilot drill guidance with a radiographic guide manually transferred into a surgical guide (non-flapless). The precision was assessed by comparing (matching) the planning CT with a postoperative CBCT.

Results: A total of 72 jaws were treated in 59 patients (34 mandibles, 38 maxillae). Thirteen patients were treated in both arches. The patients received 4–6 implants per jaw. A total of 313 Astra Tech® implants were placed. The following data have been processed for each group: Test group 1a (7/12), Test group 1b (10/12), Test group 2a (10/12), Test group 2b (7/12), control group A (9/12) and control group B (1/12). For each

group the deviation at the entry point, at the apex of the implant and the angular deviation were calculated. The following influencing factors will be analyzed: treatment group, surgical procedure, implant position, bone quantity, bone quality, smoking habits, learning curve of the surgeon.

Conclusions and clinical implications: Full data can be presented at the congress in October.

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Two alternative rehabilitation approaches to avoid bone graft: case report

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Background: Implant supported rehabilitations in the posterior regions of the maxilla and mandible with high degree of bone resorption represents a challenge due to the existing anatomical limitations (the presence of the maxillary sinus and the mandibular mental nerve) together with the association of low density bone with high occlusal loads supported by these areas. Zygomatic anchored implants and standard tilted implants could be an alternative to rehabilitate these patients that otherwise would be referred for bone grafting.

Aim: To describe the immediate fixed prosthetic rehabilitation of a patient with complete edentulous atrophic maxilla and partial edentulous atrophic mandible using zygomatic anchored implants placed extra-maxillary (maxilla) and standard implants tilted distally (mandible).

Methods: A healthy 65 years old female patient was referred to private practice concerned with poor retention, prosthetic stability and aesthetics of the removable dentures. After clinical and radiographic examinations it was decided to rehabilitate the complete edentulous maxilla using a combination of two zygomatic implants inserted extra-maxillary (NobelSpeedyTM Groovy extra-maxilla of 5 × 40 mm and 5 × 45 mm; Nobel Biocare AB, Gothenburg, Sweden) together with two standard implants in the anterior sextant (NobelSpeedyTM Groovy 4 × 13 mm); and to rehabilitate the partial edentulous mandible using one straight implant in position #43 (NobelSpeedyTM 3.3 × 13 mm) and one implant tilted distally in position #46 (NobelSpeedyTM 4 × 13 mm). Acrylic resin prostheses were delivered on the same day of surgery achieving immediate function. Success was evaluated after 1 and 3 years according to the following criteria: clinical stability, patient reported function without discomfort, absence of suppuration, infection and radiolucent areas around the implants, marginal bone resorption <2 mm.

Results: After 1 year, no implant was lost. No complications occurred on the implants or prosthesis and the patient reported satisfaction with function and aesthetics. The average bone resorption for the maxillary rehabilitation was 1.05 and 1.53 mm after 1- and 3-years of follow-up respectively. For the mandibular rehabilitation, the average bone resorption was 1.54 and 1.65 mm after 1- and 3-years of follow-up. The implants fulfilled all success criteria.

Conclusions and clinical implications: Within the limitations of this case report, the rehabilitation of the posterior regions of the maxilla and mandible using zygomatic implants placed extra-maxillary (maxilla) and implants tilted distally (mandible) was possible and predictable on the short and medium term outcomes. Prospective designed studies with adequate sample size and longer follow-ups are needed to evaluate the long-term outcome of these approaches.

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The using of Morse taper implants to maintain periimplant bone in the aesthetic area

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Background: The success of dental implants is directly related to the integration between the implant and surrounding tissue. Any change in these tissues can promote changes and even aesthetic compromise the longevity of implants. There are different hypotheses for the loss of bone crest, such as: absence of biological space module and the crest of the implant, surgical trauma, occlusal overload, peri-implantitis, presence of the interface microgap abutment/implant.

Aim: The aim of this study was to present, through a clinical case, the advantages of the implant system with morse-taper connection Implacil DeBortoli to avoid peri-implant bone loss, trying to maintain the anatomy of the tissues of these areas.

Methods: Two clinical cases the need for replacement in the anterior teeth have been used for the demonstration and evaluation of the tissue maintenance with the use of implants morse taper.

Results: Its influence can be demonstrated by the results obtained with the use of morse-taper implants and the making of the immediate provisional, because the proximal areas are unchanged in the gingival papilla and buccal, which directly influence the aesthetic treatment.

Conclusions and clinical implications: The possibility of this system with respect to the use of prosthetic platform smaller in diameter than the implant and morse-taper connection performed very positive and effective way to obtain the results of the case.

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Evaluation of the gain in bone expansion using conical tapered expanders

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Background: Deficiencies in bone surface may hamper or prevent the use of dental implants due to insufficient bone volume to harbor implants of an appropriate size or in aesthetic areas, hampering an adequate solution of the case. To correct this situation, various surgical procedures have been proposed in an attempt to repair these failures to permit the installation of implants. For this purpose, bone grafts, membranes for guided bone regeneration or the combination of both have been used. The increase in bone volume by means of expansion, in order to allow the installation of implants, may be accomplished in a single or in two procedures. The use of a single procedure technique is less traumatic, reduces costs and time. This technique is linked to the employment of conic implants and tapered expanders.

Aim: This study aims to demonstrate through an extremely simple technique how to increase bone volume in narrowed areas. It will be demonstrated by case studies and the use of conical implants and tapered expanders.

Methods: For the description of the technique two patients that needed an alveolar expansion were selected. The beds were measured before and after the expansion, in order to analyze the gain of bone volume.

Results: An increase in the bone volume was observed and a better aesthetic condition was noted in the patients. The general average gain of the final volume was 113.3 ± 29.6% of the existing volume.

Conclusions and clinical implications: We conclude that the evolution of materials available in the market allows new technical alternatives with many advantages for both, professional and patient.

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Flapless placement of zygomatic implant by using real-time surgical navigation

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Background: The application of zygomatic implants proposes a successful treatment for reconstruction of severely atrophic maxilla and maxillary defects. However, it is still a great challenge for the surgeons to place the zygomatic implants to an anatomically complex site correctly without of any risk.

Aim: In this paper, we report a new procedure for the placement of flapless zygomatic implant by using real-time surgical navigation.

Methods: A 46-year-old man receiving a surgery of hemimaxillectomy requires definitive rehabilitation. Oral examination found the deletion of right palate, perforation of oral and nasal cavity, only left cynodont presence. Details about maxilla were taken by panoramic radiograph and CT (computerized tomography) scanning. The data showed class II d defects. To ensure proper position and bone anchorage, a real-time surgical navigationwas applied during the placement of zygomatic implants to enable a constant visualization of the drill trajectory in the 3-D-constructed CT image and sagittal, coronal and axial views. Three zygoma implants and one conventional implant were appropriately placed. Besides, Computer-generated preoperative surgical planning was compared to the actual placement by CT scanning of the patient before and after surgery.

Results: Three zygomatic implants (right 1 and left 2) and one conventional implant were placed appropriately. The function, phonetics and esthetics of the maxilla were restored by this implant-supported obturator prosthesis. The follow-up examinations 28 months post-operatively showed satisfactory outcome. The result of the preoperative planning and real surgery showed that the mean distance and angular deviations were 0.58 ± 0.18 mm and 1.12 ± 0.39°, respectively.

Conclusions and clinical implications: It is an encouraging method for the placement of zygomatic implants in actual surgical procedure using real-time surgical navigation.

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Clinical evaluation of dental implants with an integrated platform switch protocol: A pilot study

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Background: Switching platform restorations seems to reduce the peri-implant inflammatory response and to preserve the peri-implant soft tissues.

Aim: The aim of this study was to evaluate the clinical outcomes of a new implant system with integrated platform-switching protocol in healthy/non-smoker patients.

Methods: Systemically healthy, non-smoker, non-medicated individuals with posterior edentulous mandibular area where no bone augmentation needed were included in the study. In total, 17 dental implants placed by same operator (DY) in nine patients's posterior mandible. Implants healed submerged and early healing period was uneventful. Following 3 months of osseointegration period, implants were exposed and 3 weeks

after abutment connection implants were loaded. Clinically; Modified Plaque Index (mPI), Modified Gingival Index (mGI), Probing Depth (PD), Bleeding on Probing (BoP), Mucosal Recession (MR), Width of Keratinized Tissue (KT) have been measured on the mesial, distal, buccal and lingual aspects of each implant at abutment connection, and at first, third months after insertion of the final prosthesis.

Results: None of implants placed of this integrated platform-switching system failed during the observation period. Site based evaluation was performed for mean change in PD values within time. Mean probing depth (buccal) (PDb) value was increased from 1.07 ± 0.27 to 1.50 ± 093 with a difference of −0.375 ± 0.74 mm, PDlingual (PDl) value was decreased from 1.29 ± 0.47 to 1.13 ± 035 with a difference of 0.375 ± 74 mm, PDmesial (PDm) value was increased from 1.43 ± 0.65 to 1.75 ± 1.04 with a difference of −0.13 ± 0.64 mm, PDdistal (PDd) value was decreased from 1.36 ± 0.75 to 1.00 with a difference of 0.50 ± 0.93 mm. There was no difference between mean GI and MR values at baseline and at third months. Mean KT value was 1.64 ± 1.15 mm at baseline while it was 2.13 ± 0.99 mm at third months post-operatively.

Conclusions and clinical implications: Within the limits of the study, it has been demonstrated that dental implants with integrated platform-switch protocol provided promising clinical results in terms of peri-implant inflammation during early healing period.

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Improvement of esthetic problems originated after installation of implant using semilunar technique on the maxillary incisor area

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Background: Installation of implants over "esthetic zone", including maxillary incisor area, requires much more attention than other regions. To guard against esthetic defect through rigorous diagnosis procedure is necessary in case of the lack of hard tissue or sort tissue before installation. However, unfavorable results are unevitable in spite of those sufficient efforts in practical clinical trials. Therefore, the minimal damage needs when dealing with those problems.

Aim: This research will introduce the covered cases of implant effectively applied to CTG with semilunar technique in the case of exposingfixture or abutment after final setting following installation of implant.

Methods: CTG using semilunar technique published by Tarnow in 1986 was implemented to 32 years old woman with exposing cervical part of implant at #11 tooth and 27 years old woman with exposing implant abutment. Particularly, CTG of the latter case was preformed after eliminating and trimming of the exposed ceramic abutment generated by location decision failure during installation implant.

Results: Both two patients' exposed regions were covered well after surgery, and patients also got contentable results. At F/U check, stable results are followed.

Conclusions and clinical implications: Connective tissue graft using semilunar technique is much more useful to improving esthetic problems on maxillar incisal implant than previous procedures because of minimizing damage of soft tissue and fastening regeneration. This technique produced stable results at F/U check.

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Facial alveolar bone wall width in Asians: a CBCT study

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Background: The width of the facial alveolar bone wall is crucial for long term successful esthetic outcomes of immediately placed implants. A threshold of 2 mm is recommended to minimize vertical bone resorption.

Aim: To assess the width of the facial alveolar bone wall using cone-beam computed tomography images (CBCT).

Methods: Retrospective CBCT images were acquired from a representative sample of Asians using the i-CAT® classic system with a 0.4 mm voxel size. At random, 200 CBCT images were selected according to predefined inclusion criteria. The DICOM file was imported into the i-CATVision® software. In the panoramic screen, the middle of each tooth was selected and, in the sagittal window, the middle cross section was selected for performing the measurements using a computer. The vertical distance from the cemento-enamel junction to the crest of the facial alveolar bone wall (CEJ-BC) was measured. The width of the facial alveolar bone wall was measured at three locations: 1, 3, and 5 mm apical to BC. Descriptive statistics, frequency analyses, and multi-level comparisons were performed.

Results: The sample consisted of 74 males and 126 females (mean age of 37.2 years; range 17–82 years). A total of 3618 teeth were assessed. There was no significant difference between the values of right and left side, or between genders. However, statistically significant differences were observed between age groups at all levels. The distance from CEJ-BC varied from 0.4 to 4 mm, with an overall tendency to increase with age. The mean width of the facial alveolar bone wall at the anterior teeth was 0.9 mm and increased towards the posterior regions. Rarely, a width of 2 mm was yielded (0.6–1.8% for the anterior teeth, and 0.7–30.8% for the posterior teeth). The frequency of dehiscence at the maxillary anterior teeth ranged from 9.9% to 28.8%, while at the maxillary posterior teeth ranged from 3.1% to 16.3%, and higher percentages were found for the mandibular teeth. At a 5 mm distance from BC,

minimal width of facial alveolar bone was identified for the anterior teeth of both jaws.

Conclusions and clinical implications: A thin facial alveolar bone wall is usually present in both jaws. Hence, for most patients, adjunctive bone augmentation may be needed when planning implant therapy in areas of esthetic concern.

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Use of 6 mm long-implants in fixed partial dentures in posterior sites (follow-up 3-year)

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Background: Short dental implants could be a viable option, especially in edentulism with limited amounts of bone available, even ifhistorically they are associated with lower survival rates than for longer implants.

Aim: To evaluate the clinical and radiographic outcome and the survival rate of two splinted 6 mm long implants supporting a fixed partial denture (FPD) placed in the posterior sites, in partially edentulous patients with a 3-year follow-up.

Methods: Forty SLActive Straumann short (6 mm) implants were placed in 20 consecutively treated patients. Eleven implants, 4.8 mm in diameter, and 29 implants, 4.1 mm in diameter, 14 mandibular and 26 mascellar were installed, supporting a 2- or 3-element FPD. Implants were loaded after 6 weeks of healing. Implant survival rate, marginal bone loss and resonance frequency analysis (RFA) were evaluated at different intervals. The clinical crown/implant ratio was also calculated.

Results: None of 40 implants were lost before loading. Hence, the survival rate at 3 year before loading was 100%. No further technical or biological complications were encountered during 3-year follow-up. The mean marginal bone loss before loading was 0.35 ± 0.39 mm. After loading, the mean marginal bone loss was 0.18 ± 0.29, 0.21 ± 0.28 and 0.23 ± 0.31 mm respectively at the 1, 2 and 3 years of follow-up. The RFA values increased between insertion (70.2 ± 9) and the 6-week evaluation (74.8 ± 6.1). The clinical crown/implant ratio increased with time from 1.3 at the delivery of the prosthesis to 1.7 after 3 years of loading.

Conclusions and clinical implications: Two splinted short implants (6 mm) with a moderately rough surface loaded early (after 6 weeks) used, in order to avoid complicated bone augmentation procedures showed an excellent clinical outcome in the treatment of the posterior mandible in this interim 3-year report. These preliminary results must be confirmed by longer follow-ups.