

## PR605

### Three-dimensional radiographic analyses of post-surgery buccal bone changes

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**Background and Aim:** The postoperative fate of buccal bone is often unpredictable, especially in maxillary anterior sextant. Recent studies report continuous bone remodeling and resorption, even after immediate implant and/or graft placement. This study aims to improve radiographic analysis of buccal bone integrity following surgery.

**Methods:** Patients receiving single implant in the maxillary esthetic zone were recruited. Cone Beam Computed Tomography (CBCT) analyses were conducted immediately post-surgery (extraction + bone graft; implant placement) and at 4 months (implant placement or uncover). Linear and volumetric measurements were performed using fixed landmarks (surgical guide and adjacent teeth) to determine changes at buccal plate. Changes in buccal bone thickness were determined at coronal (0–2 mm), middle (4–6 mm) and apical (8–10 mm) implant length portion, after automatic registration of the patient's two CBCTs.

**Results:** 15 patients completed the initial phase of the treatment (extraction and bone graft placement) with 4 months follow-up. Another 21 patients completed the second phase (post-implant placement with 4 months follow up). Mean ridge width loss detected at 4 months was  $1.04 \pm 0.2$  mm ( $n = 15$ ). For volumetric measurements, the mean change was  $-0.16 \pm 0.04$  cm<sup>3</sup> (median =  $-0.09$  cm<sup>3</sup>; min, max =  $-0.42$ ,  $+0.01$  cm<sup>3</sup>) with statistically significant differences between sites receiving socket preservation and guided bone regeneration ( $p = 0.05$ ). Post-implant surgery, buccal bone thickness at crest remains stable in average 50% of the surface area for the first 4 months. The difference between grafted and non-grafted sites was statistically significant only in the middle portion of the implant, with grafted sites presenting greater thickness stability ( $p < 0.05$ ).

**Conclusion:** Coronal and apical portions of buccal bone appear stable during early healing. A heatmap-like algorithmic tool can help overcome some CBCT limitations when evaluating buccal bone changes.

## PR606

### Bone regeneration in implant dentistry: a critical assessment of systematic reviews

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**Background and Aim:** Guided bone regeneration (GBR) is a common and predictable procedure that seeks to achieve successful implant supported rehabilitation with stability of hard and soft tissues over the years. Nowadays there is a lot of scientific information of different quality for clinical decision-making. To evaluate the methodological quality of the systematic reviews on bone regeneration in Oral Implantology.

**Methods:** A literature search for SRs with and without meta-analysis was performed in Medline, Embase, Cochrane and high-ranked journals. For studies assessing implants that had

been placed in areas submitted to GBR procedures. Titles, abstracts and full-text articles were analyzed for potential inclusion. Two calibrated reviewers performed all data extraction and appraisal. The methodological quality of the SRs was evaluated using the Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews.

**Results:** A total of 63 systematic reviews, 15 with meta-analysis, were evaluated. Sinus augmentation (SA), block graft, GBR, ridge preservation and Split crest were the most recorded procedures, where SA was the most widely studied and the most common procedure evaluated. In the AMSTAR checklist, the item more analyzed was the characteristic of the studies providing important information about of the different type of GBR procedures, also limited studies used information to combine the findings and only 65% of the studies made a qualitative methodological analysis of the articles.

**Conclusion:** GBR is a predictable technique and has been intensively studied. systematic reviews on GBR demonstrate substantial methodological variability, therefore, caution must be exercised when interpreting their findings.

## PR607

### Two-stage sinus lift with two different graft: histomorphometric and radiological outcomes – split mouth RCT

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**Background and Aim:** A tooth lost in the posterior maxilla provoke a bone remodeling and sinus pneumatization, leading to a bone height reduction. Thus, a sinus lift procedure is often required to allow implant placement. The aim of this RCT was to assess differences between xenograft (Osteobiol Mp3<sup>®</sup>) and autologous bone graft (ABG), in bilateral two-stage sinus elevation.

**Methods:** Twelve patients with residual bone (1–5 mm) were recruited. The surgical technique comprised: incision, flap raised, bone window (piezo electric) and the Schneiderian membrane elevation. A ABG (mandibular branch or chin) was harvested and grafted. The sealed envelope was open to randomly select which material apply in each sinus (xenograft or ABG). The lateral window was covered with a collagen membrane and the flap sutured. After six months, a new CT was performed and a bone samples were collected with a trephine for histomorphometric analysis and the implants placed. The Image J<sup>™</sup> was used to histomorphometric measurement and the blue sky plane3<sup>®</sup> to measure in the CT the amount of bone gain. Results are presented as mean  $\pm$  standard deviation. In order to compare materials and time we used two-way ANOVA for repeated measures (Greenhouse-Geisser correction). Pairwise comparisons were carried out by t-test (means, with Shapiro-Wilk normality testing) and by z-test (proportions). Statistical analysis was performed with SPSS25.0<sup>®</sup>.

**Results:** The ANOVA comparison determined that mean bone differed significantly with time ( $F(1,11) = 240.9$ ;  $p < 0.005$ ), showing no differences between materials ( $F(1,11) = 1.5$ ;  $p = 0.240$ ) and showing no interactions between time and material ( $F(1,11) = 1.4$ ;  $p = 0.261$ ). Furthermore, mean bone increased significantly from baseline to after 6 months for both materials ( $7.81 \pm 6.7$  mm (ABG) and  $8.7 \pm 6.2$  mm (Xenograft), with  $p < 0.005$  for both). Histological analysis showed

that the inter-subject bone proportion was  $57.31 \pm 0.05$  (ABG) and  $56.01 \pm 0.06$  (Xenograft), exhibiting no statistical differences between materials ( $p < 0.005$ ).

**Conclusion:** No significant differences between materials among time argues in favor of using the porcine xenograft in sinus lift.

## PR608

### Vertical bone gain with different augmentation methods. A systematic review and meta-analysis

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**Background and Aim:** Rehabilitation of patients with reduced alveolar ridge height requires bone augmentation, which can be done with different techniques. The aim of this review was to determine the most effective alveolar augmentation technique for vertical bone gain

**Methods:** Registration of protocol was done at Prospero (CRD # 42017072432). Systematic search was done using electronic databases, comprising PubMed, CINAHL, Dental and Oral Science. Supplementary manual searches of published full text articles from January 2005 to October 2017 were also carried out by Google Scholar. Participants: Patients with reduced vertical bone height and requiring grafting Intervention: Distraction Osteogenesis, Block plus particulate grafting with Ti-mesh, particulate grafting, Tent pole technique Comparison: Autogenous block grafting Outcome: Primary: Gain in vertical bone height Secondary: Bone resorption, implant success /survival and complications

**Results:** Searches of three data bases and hand search resulted in 2,322 articles. After applying inclusion/exclusion criteria, eight were selected for detailed evaluation. Out of which five were clinical trials and three were retrospective studies. Four studies were on distraction osteogenesis, two on particulate grafting, one on block plus particulate grafting and one on tent pole grafting. The control group in all studies were autogenous block graft. A meta-analysis was carried out for vertical bone gain and bone resorption which revealed significant difference between DO and block for bone gain ( $p$ -value = 0.03) and no significant difference for bone resorption ( $p$ -value = 0.34), whereas no significant difference was observed between particulate and block graft ( $p$ -value = 0.41) in terms of vertical bone gain

**Conclusion:** Distraction osteogenesis is superior to block grafting for vertical bone augmentation but it is associated with more complications, however there was no difference in bone resorption among both techniques. No conclusive results can be drawn on other techniques because of limited studies and trials.

## PR608A

### One stage vertical ridge augmentation and dental implantation with allograft bone rings: results one year after surgery

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**Background and Aim:** To augment bone volume, several operative methods like autogenous or allogeneous bone grafts (block

bone or shell technique, guided bone regeneration, bone splitting or sinus lifting) are possible. Although autogenous bone is still considered to be the gold standard grafting material, it is accompanied by donor morbidity. Therefore, a second surgical site for bone graft harvesting is to be avoided. Furthermore, intraoral bone grafts are limited to the size and shape of the graft. Several bone substitute materials, like allogeneic, bovine, xenogenic or alloplastic are available. The aim of this study was to analyze the success rate and peri-implant bone loss of dental implants after vertical ridge augmentation and simultaneous implantation in bone ring technique using allogeneous bone grafts.

**Methods:** The augmentation and simultaneous dental implantation in bone ring technique followed a standardized protocol. 51 patients with 81 augmentations using a bone ring for the alveolar ridge reconstruction were included. After 6 months, implants were exposed and dental prosthetics were placed. One year after surgery the following clinical and radiographic parameters were assessed: peri-implant bone loss, complications and success rate of implants.

**Results:** The implant success rate was 97.5%. 66.7% of augmentations were done in the upper jaw and 33.3% were done in the lower jaw. At surgery, the implant shoulder was placed 1.6 mm (median) below the cranial surface of the ring (CBS-I, t0). 12 months later the implant shoulder was still 1.15 mm below the cranial surface of the ring (DCSL-I, t3: 1.15 mm (median). The loss of peri-implant bone depending on the height of bone ring was not statistically significant ( $r = 0.04$ ,  $p > 0.05$ ). One year after the median loss of bone was 0.45 mm (0.45 mm maxilla; 0.85 mm mandible).

**Conclusion:** Simultaneous augmentation and implantation in bone ring technique using allograft bone rings shows a predictable outcome and is a preferable treatment option, especially in complicated cases with vertical defects.

## PR608B

### Isolation and characterisation of adult ovine neural crest-derived stem cells (ovine NCSCs) from Palatal tissue for comparative implant research and alveolar regeneration

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**Background & Aim:** Emerging evidence suggests that adult craniofacial tissues in vertebrates contain limited numbers of post-migratory neural crest-derived stem cells. These adult multipotent NCSCs possess high level of cellular plasticity which is only surpassed by pluripotent stem cells including embryonic stem cells and induced pluripotent stem cells. We hypothesized that the ovine palate contains NCSCs equipped with a developmental potential equivalent to their rodent and human counterparts.

**Methods:** For harvesting the stem cell-containing subepithelial connective tissue graft from the sheep palate two incision to the bone have been made 5 mm from the palatal gingival margin. Most of NCSCs populations can be isolated and enriched using magnetic cell separation (e.g. CliniMACS) based on their expression of the cell surface marker CD271. The yield and purity of the MACS-separation was assessed using flow cytometry.

**Results:** After isolation, oNCSCs form neurospheres, express neural crest markers (e.g. HNK-1, Slug) and differentiate into osteogenic, chondrogenic and adipogenic cells. We characterised

