Maxillary sinus augmentation: histologic and histomorphometric analysis.

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PURPOSE: Implant placement in the posterior maxilla may often be contraindicated because of insufficient bone volume and the presence of the maxillary sinus. In these situations, sinus floor lifting and grafting frequently have been proposed as the best treatment. The aim of this study was to compare histologically the use of 100% autogenous bone versus a combination of autogenous bone and corticocancellous pig bone for maxillary sinus augmentation.

MATERIALS AND METHODS: Eighteen patients requiring bilateral maxillary sinus augmentation were selected for this study. Bone for grafting was harvested from the iliac crest. Each patient received 100% autogenous bone in 1 randomly selected sinus (control side) and a 1:1 mixture of autogenous bone and corticocancellous pig bone particles in the contralateral sinus (test side). Five months after the augmentation procedure, bone biopsy specimens were taken at the time of implant placement.

RESULTS: No complications were observed during the surgical procedures; all patients healed uneventfully. No signs or symptoms of maxillary sinus disease were observed during the 5 months after surgery. No significant differences in bone percentages were observed in the bone biopsies from test and control sides.

DISCUSSION AND CONCLUSION: It could be concluded from this study that corticocancellous pig bone particles can be successfully used in a 1:1 mixture with autogenous bone from the iliac crest for maxillary sinus augmentation in cases of severely atrophic maxilla.

Osteotomy and membrane elevation during the maxillary sinus augmentation procedure. A comparative study: piezoelectric device vs. conventional rotative instruments.

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OBJECTIVES: The aim of the present study was to investigate in a randomized-controlled clinical trial the performance of rotary instruments compared with a piezoelectric device during maxillary sinus floor elevation.

MATERIALS AND METHODS: Thirteen patients who required a bilateral maxillary sinus augmentation for implant-prosthetic rehabilitation were included in this study. A within-patient control study was carried out. The osteotomy for sinus access was performed on one side of the maxilla using the piezosurgery (test sites) and on the other side using conventional rotary diamond burs (control sites). The parameters recorded were as follows: bony window length (L), bony window height (H), bone thickness (T) and osteotomy area (A)--calculated by multiplying L and H. In addition, the time necessary for the osteotomy and sinus membrane elevation as well as the number of surgical complications were calculated.

RESULTS: The mean length and height of the bone window were similar in both groups. The osteotomy area (A) obtained by multiplying L and H was wider in the control group (151.2 +/- 20.4 mm(2)) compared with the test group (137 +/- 24.2 mm(2)). The time necessary for the osteotomy and the sinus membrane elevation with conventional instruments was 10.2 +/- 2.4 min, while with the piezoelectric device it was 11.5 +/- 3.8 min. Moreover, membrane perforation occurred in 30% of the maxillary sinuses in the test group and in 23% of the control group. None of the differences observed between the two groups reached a level of significance.

CONCLUSIONS: Within the limits of the present study, it may be concluded that piezosurgery and conventional instruments did not show any differences in the clinical parameters investigated for the maxillary sinus floor elevation.


A clinical study of the outcomes and complications associated with maxillary sinus augmentation.

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PURPOSE: The aim of this study was to evaluate the rate of complications in maxillary sinus augmentation surgery and the impact of complications on subsequent implant treatment in a patient population with severe maxillary atrophy scheduled for treatment under general anesthesia.

MATERIALS AND METHODS: The study population consisted of 70 patients (124 sinuses) with severe maxillary atrophy who underwent maxillary sinus augmentation. Sixteen patients were scheduled to have a unilateral procedure and 54 patients a bilateral procedure. Sinus augmentation was performed with autogenous bone alone in 93 sinuses; in 31 sinuses, a 1:1 mixture of autogenous bone and corticocancellous pig bone particles was used. Twenty-six of 124 procedures involved both sinus augmentation and autogenous block grafting for the treatment of severely atrophic maxillae. RESULTS: The most common intraoperative complication was the perforation of the sinus membrane, which was observed in 31 sinuses (25%). Seven (5.6%) sinuses in 7 patients exhibited suppuration of the maxillary
sinus. Five of the 7 patients with sinus infection were smokers, showing a prevalence of complications significantly greater in smokers compared to nonsmokers. Moreover, the use of an onlay bone graft in conjunction with sinus augmentation appeared to significantly increase the rate of infective complications. Infections were treated by drainage and the administration of systemic antibiotics. Two clinical cases showing persistent signs of infection required an endoscopic inspection of the maxillary sinus. DISCUSSION AND CONCLUSION: In the present study sinus membrane perforation was not shown to be a significant factor in the rate of implant complications. However, the combination of smoking and onlay bone grafting could significantly increase the rate of postoperative infection following sinus grafting.

**Effect of bone mineral with or without collagen membrane in ridge dehiscence defects following premolar extraction.**


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BACKGROUND: The purpose of this investigation was to evaluate the regenerative response to deproteinized porous bovine bone mineral (BM) when used alone or in combination with a bioresorbable porcine-derived bilayer collagen membrane (CM) for alveolar ridge augmentation in dogs.

MATERIALS AND METHODS: The mandibular premolars were extracted unilaterally and three ridge defects were induced in six mongrel dogs. Each defect site was randomly assigned to one of the following treatment groups: BM alone (group A), BM in combination with CM (group B), or neither membrane nor bone graft, which served as a control (group C). No adverse events occurred during the experimental period. Dental computed tomography (CT) scans were taken after postoperative periods of 8 and 16 weeks. RESULTS: The percentage of CT-derived bone density in groups A and B was significantly different from that of group C (p < 0.01) at 8 and 16 weeks. The percentage of CT-derived bone density of the dogs in Group B was significantly higher than that of those in group A at 8 and 16 weeks (p < 0.01). Gross evaluation of the 3-dimensional CT reconstruction image of the canine mandibles after 16 weeks of implantation showed that group B had the greatest amount of bone augmentation and excellent thickness of the buccal aspect of the alveolar ridge. CONCLUSION: These results suggest that BM leads to more successful bone regeneration for guided bone regeneration procedures, especially in conjunction with the use of a CM as a barrier in order to promote the regeneration of canine alveolar ridge defects.

Effect of bone mineral with or without collagen membrane in ridge dehiscence defects following premolar extraction.
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