Sinus lift and vertical GBR of the alveolar ridge. Clinical comparison between two GBR procedures: dPTFE membrane vs customized Ti-mesh.

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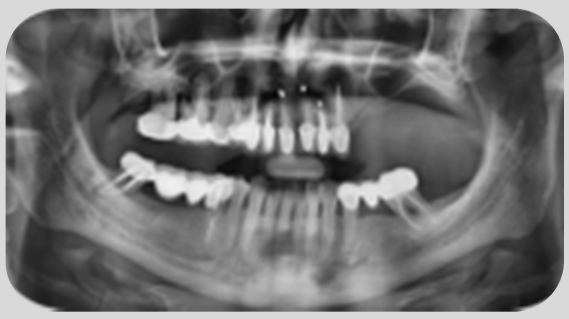
Introduction and Purpose

Vertical ridge augmentation is one of the greatest challenges for bone regeneration in implant dentistry. Adherence to the principles of primary closure, angiogenesis, stability, and space maintenance maximizes GBR success. Nonresorbable Titanium-reinforced membranes and Titanium meshes may improve space maintenance and eliminate the need for tenting screws used with absorbable membranes[1]. In the atrophic posterior maxilla, lateral window sinus floor augmentation was shown to be a reliable procedure in the long term for the partially and fully edentulous maxilla[2].
Aim of this study is to compare clinical outcomes of two different vertical GBR procedures.

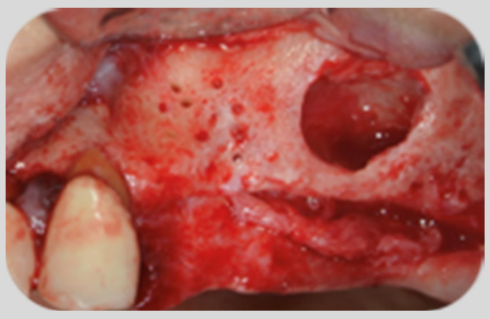
Materials & Methods

Two patients, aged 60 and 54, affected by severe posterior atrophy (Class V in accordance with Cawood and Howell classification[3]), underwent sinus lift and GBR interventions.
Preoperative analysis was carried out in terms of clinical and radiographic (OPG and cone beam) examinations.
Surgical protocols involved a major sinus lift technique accomplished by lateral window[4] and either a GBR intervention by means of a non-resorbable Ti-reinforced membrane (Cytoplast® Ti-250 dPTFE membrane[§]) or the employment of a customized Ti-mesh (Yxoss CBR®[§§]) covered by a natural pericardium collagen membrane (Heart® pericardium membrane[§§§]). Both vertical GBR and sinus lift procedures involved bone grafting, made by a mixture of half autogenous bone and half bone substitute (EQUIMATRIX® natural bone mineral matrix[§§§§]).
After 7 months of healing second surgery was performed in order to remove non-resorbable materials and implant positioning.
Another cone beam examination was then required for the purpose of regenerative outcome measurement.

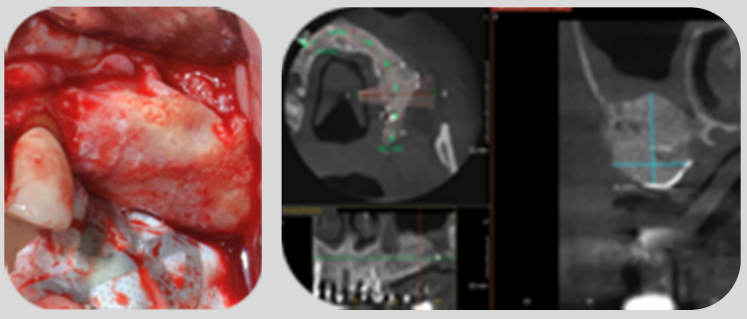
CASE I



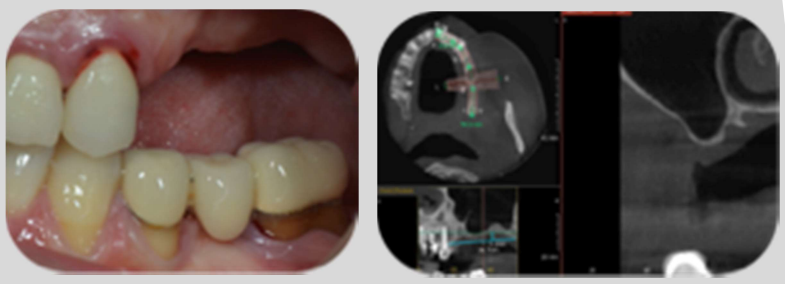
PREOPERATIVE ANALYSIS

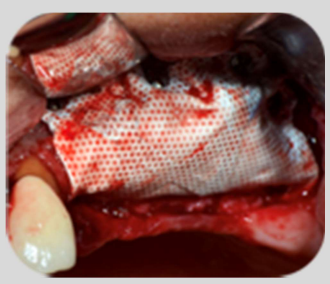


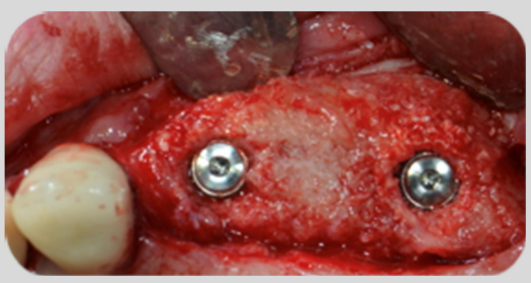
SURGERY



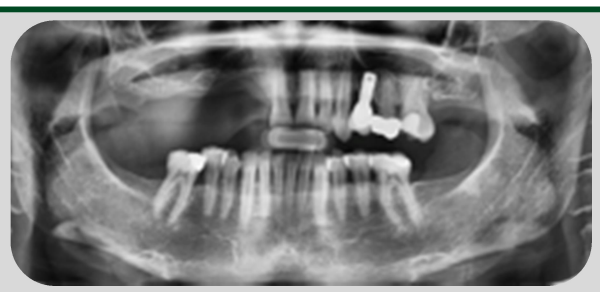
RE-ENTRY AT 7 MONTHS

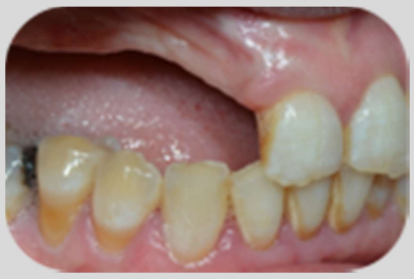






CASE II





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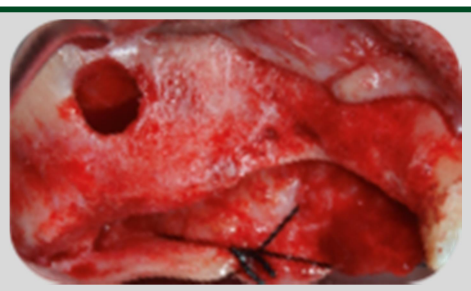

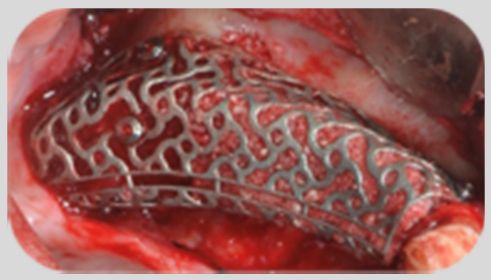

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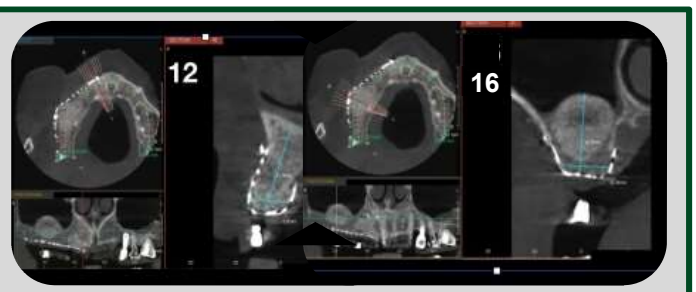

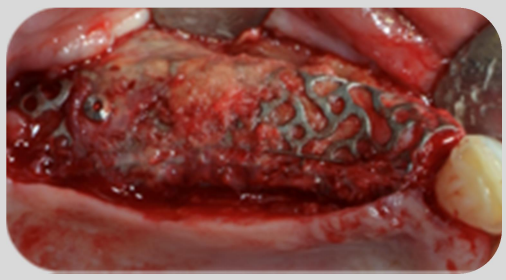

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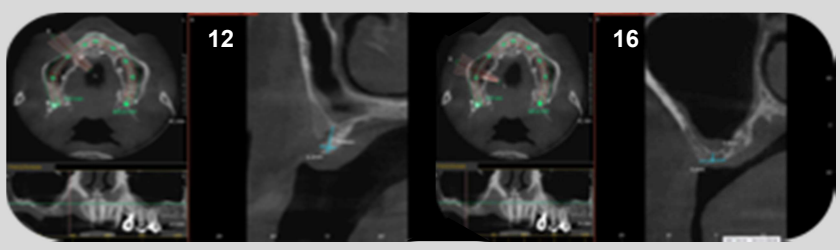

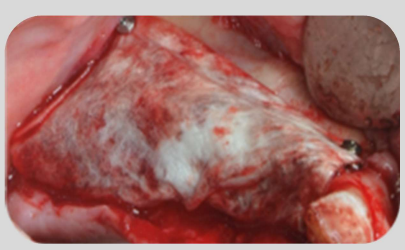

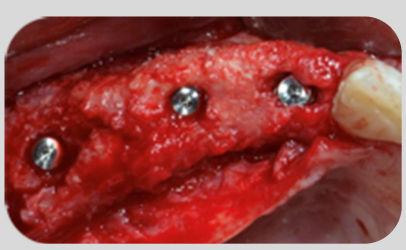

Results and Conclusions

The second surgery after 7 months in **case I** showed a very hard and compact regenerated bone and a good bleeding during the drilling phase.
45 N torque was reached during implant positioning.
In **case II** at re-entry, customized Ti-mesh was very hard to remove. Newly regenerated bone was not compact like the one obtained in case I and some soft tissue could be found between the meshes of the customized Ti-mesh. A good bleeding could be appreciated while drilling, but only 25 N torque was reached during implant positioning despite sub-preparation of implant site.

1. Plonka AB, Urban IA, Wang HL**.** Decision Tree for Vertical Ridge Augmentation**.** Int J Periodontics Restorative Dent. 2018;38:269-275. **2.** Jepsen S et al. Regeneration of alveolar ridge defects. Consensus report of group 4 of the 15th European Workshop on Periodontology on Bone Regeneration. J Clin Periodontol. 2019;21:277-286. **3.**Cawood JL, Howell RA. A classification of the edentulous jaws. Int J Oral Maxillofac Surg 1988;17:232-236. **4**. Boyne PJ, James RA. Grafting of the maxillary sinus floor with autogenous marrow and bone. J Oral Surg 1980;38:613-6.

[§]Osteogenics Biomedical, Lubbock, TX, USA; [§§] ReOss® Ltd., Filderstadt, Germany; [§§§] BiOTECK®, Vicenza, Italy; [§§§§]Osteohealth, Luitpold Pharmaceuticals Inc., New York, USA.