More new bone with Geistlich Bio-Oss® than with β-TCP


Results

12 months postoperatively:

The amount of newly formed bone was significantly higher for patients who have been treated with Geistlich Bio-Oss® compared to patients who received β-TCP.

The use of β-TCP led to a high amount of connective tissue, whereas Geistlich Bio-Oss® was well integrated in the newly formed bone.

Conclusion

Geistlich Bio-Oss® is characterised by an excellent osteoconductivity and osseointegration. Due to its natural origin Geistlich Bio-Oss® serves as a suitable matrix for effective bone regeneration also in challenging defects.

The Study

Bilateral sinus floor augmentation in 12 patients:

- Geistlich Bio-Oss® + autogenous bone + Geistlich Bio-Gide®
- β-TCP + autogenous bone + Geistlich Bio-Gide®
The amount of newly formed bone in sinus grafting procedures depends on tissue depth as well as the type and residual amount of the grafted material


Abstract

Objectives: Bone replacement substitutes are almost unavoidable in augmentation procedures such as sinus grafting. The objective of the present study was to evaluate the osteoconductive capability of two different scaffold fillers in inducing newly formed bone in this procedure.

Material and Methods: Sinus floor augmentation and implant placement were carried out bilaterally in 12 patients. Bovine bone mineral (BBM) was grafted on one side and b-tricalcium phosphate (b-TCP) on the contralateral side. Both were mixed (1:1 ratio) with autogenous cortical bone chips harvested from the mandible by a scraper. Hard tissue specimen cores were retrieved from the augmented sites (at the previous window area) at 12 months. Decalcified sections were stained with haematoxylin - eosin and the fraction area of new bone and filler particles was measured. In addition to the effect of the filler on new bone formation, the latter was tested to determine whether it correlated with the tissue depth and residual amount of the grafted material.

Results: Bone area fraction increased significantly from peripheral to deeper areas at both grafted sites in all cores: from 26.0% to 37.7% at the b-TCP sites and from 33.5% to 53.7% at the BBM-grafted sites. At each depth the amount of new bone in BBM sites was significantly greater than that in TCP sites. However, the average area fraction of grafted material particles was similar in both fillers and all depth levels (b-TCP 52.7.9 -23.2% and BBM 52.9.2-22.6%, NS). A significant negative correlation was found between bone area fraction and particle area fraction at the middle (p<0.009) and deep (p<0.014) depths in the b-TCP sites, but not at the BBM sites.

Conclusions: At 12 months post-augmentation, the two examined bone fillers, b-TCP and BBM, promoted new bone formation in sinus grafting but the amount of newly formed bone was significantly greater in BBM-grafted sites. However, both exhibited similar residual grafted material area fraction at this healing period. This could imply that BBM possesses better osteoconductive properties.