Biofunctionality of Geistlich Bio-Oss®: Excellent tissue response after 7 years


Results

After 20 months

- Direct contact at the interface between newly formed bone and Geistlich Bio-Oss®
- Excellent osteoconductivity
- Lamellar bone organization is observed
- Ongoing remodelling process and new bone formation

After 7 years

- Intensive contact between Geistlich Bio-Oss® and mature bone
- Geistlich Bio-Oss® is completely surrounded by mature bone
- Numerous osteocytes and Haversian canals are colonized by cells
- Bone adjacent to Geistlich Bio-Oss® shows well-organized lamellar structure

Conclusion

- Geistlich Bio-Oss® offers volume stability through integration
- Instead of rapid resorption, Geistlich Bio-Oss® is integrated in the natural remodelling process
- Extensive bony coverage of Geistlich Bio-Oss® is proof of its high osteoconductivity

This is the first study showing the favourable long-term tissue response to Geistlich Bio-Oss®, referring to TEM data after 7 years.

Study design

- Evaluation of histological (light microscopy: LM) and ultrastructural (transmission electron microscopy: TEM) features of bone surrounding Geistlich Bio-Oss® particles
- Two bone cores (20 months/7 years) from a Geistlich Bio-Oss® regenerated sinus
Abstract

Aim: The aim of the present study was to evaluate histological and ultrastructural features of bone surrounding Bio-Oss® particles retrieved, in the same patient, 20 months and 7 years after sinus augmentation.

Materials and Methods: A 54-year patient who needed sinus elevation before implant rehabilitation participated in this study. Two bone cores at two different times were harvested from a Bio-Oss® regenerated sinus and processed for examination under light and transmission electron microscopy.

Results: Under light microscopy, in the 20-month specimen, most of the particles were surrounded by a thin layer of newly formed bone; in the 7-year specimen there was mainly compact bone in direct contact with the particles. Under transmission electron microscopy, it was possible to characterize the bone–biomaterial interface; in the 20-month specimen an electron-dense layer was seen, whereas, almost no electron-dense lines were seen at the interface in the 7-year specimen.

Conclusions: Bio-Oss® particles did not interfere with bone-healing processes after sinus augmentation procedures and promoted new bone formation. This study can help clinicians to understand better the morphological characteristics of bone regeneration processes using Bio-Oss® after 20 months and, most importantly, after a longer time of interaction with surrounding tissues.