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Histological and radiological evaluation of sintered and non-sintered deproteinized bovine bone substitute materials in sinus augmentation procedures. A prospective, randomized-controlled, clinical multicenter study.

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Abstract

OBJECTIVES: The objective of this study is to histologically and radiologically compare a sintered and a non-sintered bovine bone substitute material in sinus augmentation procedures.

MATERIALS AND METHODS: Thirty-three patients were included in the clinically controlled randomized multicentre study resulting in a total of 44 treated sinuses. After lateral approach, sinuses were filled with either a sintered (SBM, Alpha Bio's Graft[®]) or a non-sintered (NSBM, Bio Oss[®]) deproteinized bovine bone substitute material. The augmentation sites were radiologically assessed before and immediately after the augmentation procedure as well as prior to implant placement. Bone trephine biopsies for histological analysis were harvested 6 months after augmentation whilst preparing the osteotomies for implant placement.

RESULTS: Healing was uneventful in all patients. After 6 months, radiological evaluation of 43 sinuses revealed a residual augmentation height of 94.65 % (±2.74) for SBM and 95.76 % (±2.15) for NSBM. One patient left the study for personal reasons. Histological analysis revealed a percentage of new bone of 29.71 % (±13.67) for SBM and 30.57 % (±16.07) for NSBM. Residual bone substitute material averaged at 40.68 % (±16.32) for SBM compared to 43.43 % (±19.07) for NSBM. All differences between the groups were not statistically significant (p > 0.05, Student's t test).

CONCLUSION: Both xenogeneic bone substitute materials showed comparable results regarding new bone formation and radiological height changes in external sinus grafting procedures.

CLINICAL RELEVANCE: Both bone substitute materials allow for a predictable new bone formation following sinus augmentation procedures.

KEYWORDS: Augmentation; Bone substitute; Implantology; Sintering; Sinuslift; Xenograft

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