Evaluation of the Bone Regenerating Effects of Two Anorganic Bovine Bone Grafts in a Critical-Sized Alveolar Ridge Defect Model

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A preclinical trial was conducted to treat 54 mandibular critical-sized alveolar ridge defects in 27 canines. Each hemimandible was randomized to be treated with two different anorganic bovine bone grafts (group A = InterOss [Sigma Graft]; group B = Bio-Oss [Geistlich]) or negative control (group C = empty defect) followed by a 4-, 8-, or 12-week observation period. Microcomputed tomography, histology, histopathology, and histomorphometric analyses have been performed to evaluate the safety and efficacy of these treatments. By all the parameters assessed in this study, the biocompatibility and healing of group A treated defects were indistinguishable from those in group B. Radiographic comparison of graft resorption and bony integration demonstrated similar mean scores for both treatment groups. Likewise, no statistical differences were observed between the two groups with respect to percent mineralized volume and density. When compared to the critical-sized empty controls, both treatment groups showed statistically greater amounts of bone present in the defect sites and appeared to help preserve the mesial and distal alveolar walls of the defect. Histomorphometry also supported the similarity in performance of both tested groups as no statistically significant differences were observed with regard to percent bone, percent residual implant, and percent bone marrow values. While not statistically different, on average group A had more than twice the mean amount of bone present at 8 and 12 weeks compared to group B. Overall, group A had a good biocompatibility response, similar to group B. Clinical studies are recommended to confirm these findings. Int J Periodontics Restorative Dent 2017;37:e234–e244. doi: 10.11607/prd.3305

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