

Journal Paper

Physicochemical characterization of InterOss[®] and Bio-Oss[®] anorganic bovine bone
grafting material for oral surgery-A comparative study

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Abstract

Objectives. The anorganic bovine bone grafting materials have been widely used to fill bone defects in periodontal and maxillofacial surgery. The purpose of present study was to fully characterize our anorganic bone, InterOss[®], by physical and chemical methods and to compare it with another anorganic bone, Bio-Oss[®] that has been commercially distributed in dental bone graft substitute market since 1995.

Methods. InterOss[®] anorganic bone had been successfully prepared by chemical treatment and low temperature annealing process. Commercially available Bio-Oss[®] anorganic bone was chosen for comparison. The physicochemical properties of both InterOss[®] and Bio-Oss[®] anorganic bone was characterized by SEM, XRD, FT-IR, BET, EDS, and ICP-MS. The content of residual organic substance was investigated by protein analyzer and TGA.

Results. The physical and chemical analysis indicated that the pore structure, microstructure, phase structure, and chemical composition of InterOss[®] is substantially equivalent to that of Bio-Oss[®]. The BET analysis also showed that the inner surface area of InterOss[®] is higher than that of Bio-Oss[®]. Specially, the protein analysis showed that the content of residual protein of InterOss[®] is much lower than that of Bio-Oss[®]. It is suggested that in spite of low temperature processing, the InterOss[®] anorganic bone is significantly separated and

purified from bovine bone.

Significance. Based on an equivalency to Bio-Oss[®] in terms of physical and chemical characterization with both higher inner surface area and lower residual protein content, the InterOss[®] can be a promising candidate as dental bone grafting material in periodontal and maxillofacial surgery.

Keywords: Dental bone grafting; Anorganic bovine bone; Physical analysis; Chemical analysis