



A collagenated porcine bone substitute for augmentation at Neoss implant sites: a prospective 1-year multicenter case series study with histology

ABSTRACT

It is well known that the presence of localized defects and/or small amounts of bone below the maxillary sinus can compromise implant placement. In such situation, in order to achieve predictable results, it is necessary to perform specific bone augmentation techniques. Different bone substitutes and barrier membranes are commonly used for the augmentation of localized defects and of the maxillary sinus floor and the aim of this study was to evaluate from a clinical and histological point of view a porcine bone (PB) substitute used for augmentation of the alveolar crest or the maxillary sinus floor prior to or in conjunction with implant placement. The biomaterials used were two types of collagenated bone of porcine origin (OsteoBiol® Gen-Os® or OsteoBiol® mp3®, TecnoSS®, Giaveno, Italy), two types of collagen gel (OsteoBiol® Gel 40 or OsteoBiol® Gel 0, TecnoSS®), and two types of membranes (OsteoBiol® Evolution Fine or OsteoBiol® Lamina Soft X-fine, TecnoSS®). 19 patients were treated, with a total of 34 implants (Neoss Ltd., Harrogate, UK) placed. Implants were followed with implant stability measurements at placement and abutment connection, and with intraoral radiographs at abutment connection and after at least 1 year of loading. A biopsy for histology and morphometry was taken at the first re-entry operation. The results show that all but one procedure resulted in successful augmentation, with an overall procedure success rate of 94,7% and 90% for maxillary sinus floor augmentations. The histological examination showed the formation of new bone at the PB surface, forming bridges between particles and between particles and preexisting bone. The presence of scalloped resorption lacunae and new osteons inside the particles indicated ongoing resorption/remodeling of the particles.

CONCLUSIONS

The clinical cases presented in this study showed that collagenated PB could effectively be used for bone augmentation of various defects in all the 19 patients. The study included different defects and treatment strategies because the Authors decide to evaluate the use of the PB in consecutive patients with different needs as usually dealt with in everyday practice. This study showed good clinical results when using a PB substitute and barrier membranes for augmentation of the alveolar crest and maxillary sinus and the histology revealed osteoconductive properties of the material and also indicated osteoclastic resorption.

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