



Shell Technique with a Xenogenic Cortical bone Lamina and Particulate Bone Graft for Horizontal Ridge Augmentation: A Case Series

ABSTRACT

In case of severely resorbed alveolar ridges, the “shell” technique with an autogenous split bone graft can be performed for bone augmentation at the same time as implant placement. Nevertheless, as autogenous bone grafts are related with high bone resorption and patient morbidity, a reasonable alternative might be a xenogeneic cortical bone lamina plate combined with a particulate bone graft to serve as a scaffold or “shell” to prevent flap collapse and maintain the biologic space necessary for bone regeneration. Consequently, the aim of this prospective case series was to evaluate the efficacy and safety of a xenogeneic cortical bone lamina utilized as a “shell” on the buccal aspect of narrow alveolar ridges for horizontal bone augmentation prior to implant placement. Fifteen patients requiring multiple implant restorations at sites with moderate to severe horizontal bone deficiency were consecutively enrolled and subjected to horizontal bone augmentation with a xenogeneic (equine) cortical bone lamina (XCBL) graft (OsteoBiol® Lamina®, Tecnos®, Giaveno, Italy) trimmed, and adapted to the site and then stabilized on the buccal aspect of the ridge with titanium screws. The bony defect was filled with a combination of approximately 50% particulate autogenous bone graft and 50% particulate porcine hydroxyapatite (OsteoBiol® Gen-Os®, Tecnos®, Italy). In total, 27 implants were placed in the augmented sites. The healing was uneventful in all sites, without complications or adverse reactions with the XCBL, and all implants were integrated at all sites at the 6-month reentry procedure. CBCT scans were taken at baseline and 6 months after bone augmentation and used for the assessment of the horizontal bone gain: the calculated average horizontal bone gain was 4.79 ± 1.64 mm, 5.59 ± 1.51 mm, and 5.79 ± 2.53 mm at 1-, 3-, and 5-mm reference points apical to the buccal bone crest, respectively. The horizontal bone width (HBW) after bone augmentation with the described “shell” technique was significantly higher than the HBW at baseline ($P < 0.01$ at all reference points).

CONCLUSIONS

The present case series demonstrated the use of a xenogeneic cortical bone lamina (XCBL) in combination with particulate bone graft (approximate 1:1 ratio of autogenous bone and porcine hydroxyapatite) for predictable horizontal bone augmentation prior to implant placement. As concluded by the Authors, “the clinical-, radiographic-, and patient-centered outcomes suggest that this approach can be efficiently employed for horizontal bone augmentation”.

VERTICAL AUGMENTATION

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