Horizontal ridge augmentation using GBR with a native collagen membrane and 1:1 ratio of particulated xenograft and autologous bone: a 3-year prospective clinical study

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Aim
to clinically and radiographically evaluate bone regeneration of severe horizontal bone defects.

Material and Methods
This study was designed as a single cohort, prospective clinical trial. Partially or fully edentulous patients, having less than 4 mm of residual horizontal bone width were selected and consecutively treated with resorbable collagen membranes and a 1:1 mixture of particulated anorganic bovine bone and autogenous bone, 7 months before implant placement. Tapered body implants were inserted and loaded 3 to 6 months later with a screw retained crown or bridge. Outcomes were: implant survival rate, any biological and prosthetic complications, horizontal alveolar bone dimensional changes measured on cone beam computed tomography (CBCT) taken at baseline and at implant insertion, peri-implant marginal bone level changes measured on periapical radiographs, plaque index (PI), and bleeding on probing index (BoP).

Results
Eighteen consecutive patients (11 females, 7 males) with a mean age of 56.8 years (range 24-78) and 22 treated sites received 55 regular platform implants. No patient dropped-out and no implants failed during the entire follow-up, resulting in a cumulative implant survival rate of 100%. No prosthetic or biological complications were recorded. Supraimposition of pre- and 7-month post-operative CBCT scans revealed an average horizontal bone gain of 5.03 ± 2.15 mm (95% CI: 4.13–5.92 mm). Three year after implant installation, mean marginal bone loss was 1.15 ± 0.28 mm (95% CI 0.84–1.22mm). PI was 11.6% and BoP was 5.2%.

Conclusions
Within the limitation of the present study, high implant survival rate and high average bone augmentation seem to validate the use of collagen resorbable membranes with a 1:1 mixture of particulated anorganic bovine bone and autogenous bone, for the reconstruction of severe horizontal ridge defects.

Pre-op picture

Horizontal GBR with 50% autologous bone 50% anorganic bovine bone and collagen membrane

Implant installation

Soft tissue healing after gengiva-graft

Final prosthesis 3 year follow-up

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