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Introducing a novel fixation method for GBR using non-resorbable e-PTFE -Membranes : a retrospective case series study

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Introduction

Guided Bone Regeneration can be performed in numerous ways. Both resorbable or non-resorbable approaches have a similar complication rate of 18.3% vs 17.6% depending on the literature [1].

The aim of the present study was to investigate the clinical outcome of a newly developed GBR treatment with Ti-reinforced non-resorbable membranes secured to simultaneously placed implants.

Material and Methods

All patients had a buccal defect and were treated with a GBR procedure using Neoss NeoGen Cape non-resorbable titanium reinforced e-PTFE membranes.

This membrane is equipped with a coronal hole with the diameter of a modified cover screw to allow placement and fixation over the simultaneously placed implant. To connect the membrane with the implant a spacer was used. It is screwed on to the implant and serves both to connect to the membrane screw and to allow over-contouring of the newly augmented bone. The membranes were left in situ for an average of 4.2 months (range 1-7).

Clinical and radiological parameters (DVT-scans) were measured at time of membrane placement, at membrane removal, and at follow-up visit average 7 months after membrane placement (range 3-18 months).

At each visit implant survival, complications, and height of buccal defect (distance from top of the implant to the buccal bone level) were measured.

Results

The study group consisted of 42 patients (52% females, mean age 46 years) treated with 50 NeoGen Cape membranes each secured to a Neoss ProActive Tapered implant at time of implant placement.

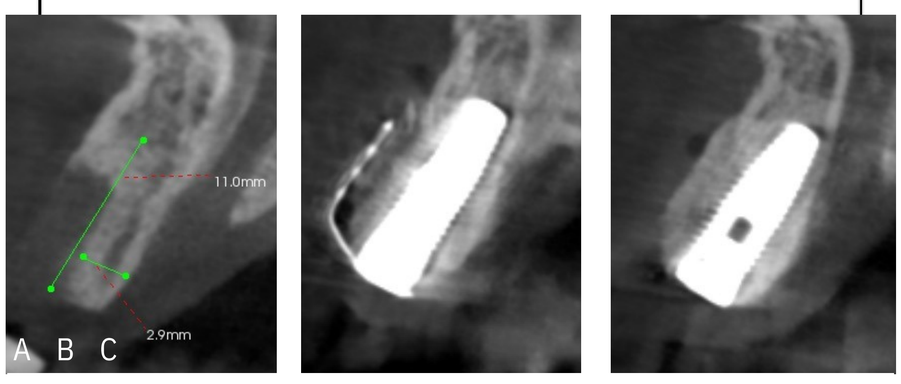

Figure 1: CBCT-scans of a 57 year old male patient who lost his tooth #11. (A) Before implantation showing the buccal defect. (B) Postoperative situs showing the membrane screwed to the implant. (C) Showing the implant + the augmented bone at latest follow up (17 months)

No implant failure occurred, resulting in an overall implant survival rate of 100% after up to 18 months. Five membrane complications occurred during healing, showing incipient signs of infection.

The complications (3 membrane exposures, 2 fistulas) led to earlier removal of the membranes. By reducing the buccal defect significantly all of the 5 complications still led to a satisfying clinical outcome.

No complications were recorded after time of membrane removal.

Mean buccal defect at time of membrane placement was 4.9±2.3 mm, at time of membrane removal 0.0±0.1 mm, and at latest follow-up visit 0.4±0.9 mm.

At the time of membrane removal complete defect fill was achieved at 94% of all sites.

Mean buccal bone augmentation from membrane placement to latest follow-up visit was 4.3±2.1 mm.

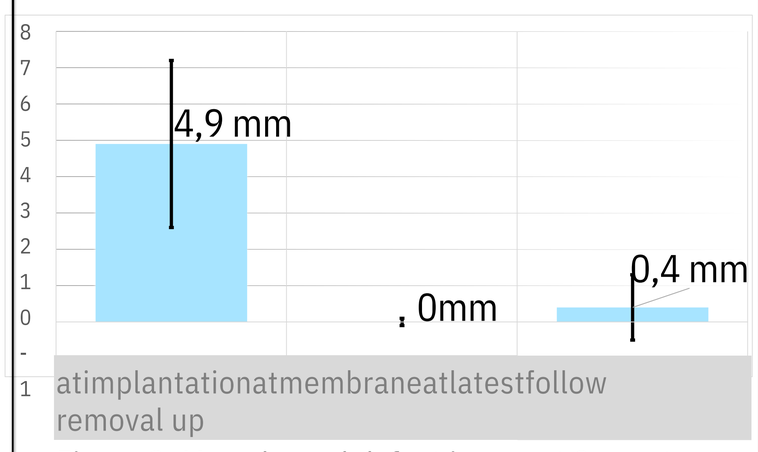

Figure 2: Mean buccal defect in mm at 3 events

Discussion & Conclusion

The results of this retrospective study show that a good clinical outcome can be achieved with the described method. This is confirmed by successful regeneration of defect, low complication rate, high implant survival, and good bone maintenance over time.

Compared to conventional GBR it could provide a more predictable outcome, especially in the regions of severe bone loss concerning the quality of the newly built bone. The hard tissue support of the fixed gingiva in the papilla area allowed a predictable reconstruction of the mucosa i.e. papilla.

Literature cited

1.Lim, G., et al., *Wound Healing Complications Following Guided Bone Regeneration for Ridge Augmentation: A Systematic Review and Meta-Analysis.*Int J Oral Maxillofac Implants, 2018. 33(1): p. 41–50.

Further information

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