

Horizontal and Vertical Bone Augmentation with Titanium Reinforced d-PTFE Membranes: Case Series in 8 Patients

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Topic: Implant therapy outcomes, surgical aspects

Abstract

Case series evaluate the use of titanium reinforced nonresorbable high-density polytetrafluoroethylene membrane, in combination with a mixture of particulated autogenous bone graft and deproteinized anorganic bovine bone graft material, for vertical and horizontal augmentation of deficient alveolar ridges. 10 augmentation procedures carried out in 8 patients. Alveolar ridge defects, treated with d-PTFE membrane, exhibited suitable bone formation for implant application after 8 months healing period at least. There were no inflammation and foreign body reactions. 3 months later after implant placement, prosthesis were done and the treatment procedure were completed. As the result of this study, one can say; bone augmentation using nonresorbable high-density PTFE membranes shows predictable results.

Background and Aim

Titanium dental implants are widely used in dentistry since "Osseointegration" has explained. Nowadays the main purpose of implant dentistry is to achieve aesthetic and functional predictable results. So that sufficient bone support around implants is most important factor for the success. Bone augmentation utilizing guided bone regeneration (GBR) has become a major treatment option to provide optimal bone support for osseointegrated dental implants. Also GBR has demonstrated reproducible outcomes for horizontal and vertical ridge augmentations with high implant survival rates and low complication rates. Many kinds of graft materials were used in GBR to reproduce new bone. According to recent studies deproteinized anorganic bovine bone mixed with autogenous particulated bone is most suitable option for the success of GBR. The most common types of barrier membranes used for bone regeneration are made of expanded polytetrafluoroethylene (e-PTFE) or resorbable materials, such as collagen. An alternative to an e-PTFE or resorbable membrane is a high-density polytetrafluoroethylene (d-PTFE) membrane.

This case series evaluated the use of titanium reinforced d-PTFE membrane for horizontal or vertical augmentation of deficient alveolar ridges.

Methods and Materials

The case series reports on patients who applies to our department with partial edentulousim and treated with vertical and horizontal ridge augmentation procedure. A mixture of xenograft and autogenous particulated bone grafts (%50-50, Fig 1) were used for augmentation and were covered with a titanium-reinforced nonresorbable membrane (Fig 1c). This membrane was shaped before application and stabilized with titanium screws. Ridge measurements were obtained before and after the procedure and complications were recorded. Six horizontal and four vertical ridge augmentation procedures were performed in 8 patients.



Figure 1



Figure 1a



Figure 1b



Figure 1c



Figure 1d



Figure 1e



Figure 2



Figure 2a



Figure 2b

Results

10 augmentation procedure in 8 patients were accomplished. Following the surgery, swelling and postoperative pain was tail off within 10 days. Swelling was remarkable after 1 week surgery. Vertical and horizontal defect sites were treated successfully with an average bone gain of 6 and 4 mm at horizontal and vertical defect sites respectively. 1 week following surgical procedure, one membrane exposure had seen at maxilla (Fig 3a). After 8 months of healing, All augmented ridges were sufficient in width and height for subsequent implant placement clinically. Implants were placed in these augmented sites. 3 months after implantation, final prosthetic restorations were completed with cement retained metal-porcelain bridges. All implants have survived with an average follow-up period of 12 months and no more than 1 mm bone loss was observed in radiographic measurements.



Figure 1f



Figure 1g



Figure 2c



Figure 2d

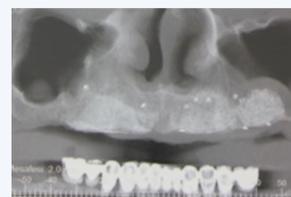


Figure 3



Figure 3a



Figure 3b

Conclusions

Within the limitations of case series, the treatment of vertical and horizontal alveolar defects with d-PTFE membrane can be regarded as successful. However it was noticed that, technical precision and surgeons experience is crucial for the success of this procedure.

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