

Management & resolution of a circumferential infrabony defect with combined endo-perio lesion by using equine derived xenograft & pericardial GTR memberane - A case report

Sudhanshu Agrawal^{1,*}, Anand Kishore², Komal S. Sharma³, Chetan Sharma⁴, Dipti Singh⁵

^{1,2,3}Dept. of Periodontology, ⁴Dept. of Oral Pathology, ⁵Dept. of Oral medicine⁴, Chandra Dental College, R.M.L. Awadh University, Dharsania, Uttar Pradesh India

***Corresponding Author:**

Email: drsudhanshu_bds@hotmail.com

Abstract

Aim: The aim of this study was to evaluate the role of an equine bio-resorbable membrane with an equine bone graft substitute in the management of a circumferential infrabony defect in a maxillary right central incisor in a patient diagnosed with localized aggressive periodontitis with Endo-Perio lesion.

Methodology: Patient with an Endo-Perio lesion having a circumferential defect of 5-8 mm around the maxillary right central incisor was evident after debridement. The defect was filled up with an equine based bone graft substitute and covered with a bio-resorbable GTR membrane.

Results: Significant improvement in all periodontal variables was found. There was reduction in probing depth of 6 mm, resolution of tooth mobility and increase in the bone fill at 6 months postoperatively.

Conclusion: In this case of a circumferential defect associated with localized aggressive periodontitis with Endo-Perio lesion, excellent results in terms of probing depth reduction and bone fill were obtained. The results were stable till the last follow up at 6 months.

Keywords: Circumferential Infrabony Defect, Aggressive Periodontitis, Endo-Perio Lesion, Equine Based GTR Membrane & Bone Graft.

Introduction

The use of bone graft substitutes for treating bony defects resulting from periodontitis has been reported evaluated and reviewed quite exhaustively since the era of iliac bone grafting.⁽¹⁾ Evidence of true periodontal regeneration has not been conclusive in case of bone grafts. As a result newer materials are constantly being researched with the aim of finding a material, which will be able to help in regenerating the lost periodontium. Guided tissue regeneration has improved the predictability of periodontal regeneration considerably and there has been considerable advancement in the research for newer GTR materials as not only barriers but also as delivery devices to release specific agents.

Case Report

A 36 year old male patient reported with the chief complaint of bleeding and swelling of gums in relation to right upper tooth since 20 days. On examination there was a periodontal pocket of 8 mm on the mesial aspect and 7 mm on the distal aspect of maxillary right central incisor & 6 mm on buccal aspect (Fig. 1). There was no tenderness or pus discharge. Radiograph revealed infrabony defects on both the mesial as well as distal aspect of 11 with Endo treatment done. (Fig. 2). The treatment plan was to carry out a complete debridement in 12, 11 & 21, region and place a GTR membrane along with the bone graft substitute to fill the defect.



Fig. 1: Preoperative View



Fig 2: Radiographic view with Endo treatment

Surgical Technique: A mucoperiosteal flap was raised from 12, 11 & 21 region utilizing the simplified papilla preservation flap to ensure maximum coverage of the grafted site. The flap was extended to include one tooth

on either side of the defect site so as to allow adequate reflection without giving a vertical incision. After complete removal of the granulation tissue and complete debridement, a circumferential defect of 8 mm was present around 11 (Fig. 3a, 3b). The bone graft substitute (equine derived Bio-Gen®) was placed in the defect to fill it completely (Fig. 4) and then covered with a resorbable GTR membrane (equine bioabsorbable collagen barrier (Biocollagen®, Biotech Italy) (Fig. 5). The flap was sutured approximating it on both buccal and palatal aspects to completely cover the membrane, then interrupted sutures given and coepack applied. (Fig. 5, 6)



Fig. 3a: Vertical Wall Defect



Fig. 3b: Circumferential Defect



Fig. 4: Graft Material & Resorbable Membrane Placed



Fig. 5: Interrupted Sutures Given



Fig. 6: Coe-Pack Given

Post-surgical treatment and follow-up: The patient was given plaque control instructions that included use of 0.12% Chlorhexidine rinse twice daily and to avoid tooth brushing in the operated quadrant. The sutures were removed 10 days following surgery. The Chlorhexidine rinse was advised for 2 more weeks. The patient was advised to brush in the operated segment using a soft toothbrush. The patient was put on regular recall at 1, 3, 6, 9 & 12 months. The symptoms of bleeding and swelling had disappeared. There was reduction in probing depth at the three month recall and by the 3 month recall the patient was comfortable with no recurrence of symptoms (Fig. 7).



Fig. 7: 3 Months Postoperative

Discussion

The reconstruction or restoration of osseous defects caused by inflammatory periodontal disease is a continuing challenge in periodontal therapy. Bone grafting is the most common form of regenerative therapy that has been constantly explored and histologic evidence in humans has shown regeneration of bone, cementum and periodontal ligament.^(2,3) A good plaque control by the patient and regular maintenance visits has shown successful clinical results with bone grafting lasting for longer than 20 years. However, histologic evaluation of alloplastic bone graft substitutes has shown limited regenerative potential and these materials appear to function as non-irritating fillers.⁽⁴⁾ The rationale of using GTR is based on the advantages offered by the GTR membrane. First, exclusion of the epithelium and gingival connective tissue cells from the periodontal defect during healing permits pluripotent cells from the periodontal ligament and the alveolar bone to repopulate the periodontal defect favoring

periodontal regeneration as the defect heals. Second the barrier maintains space between the defect and the barrier allowing the entry of regenerative cells from the periodontal ligament and alveolar bone. Finally the membrane helps in stabilizing the clot and this may further enhance regeneration.⁽⁵⁾

GTR has been widely used to treat different types of osseous defects successfully. Three-walled defects have shown the best response to GTR therapy resulting in substantial bone fill. Patient selection is an important aspect in achieving success in any therapy. The defects which have shown successful regenerative healing with GTR include narrow two or three walled defects with minimum 4mm attachment loss, a minimum of 4mm depth infra bony defect, circumferential defects and Grade II furcation defects.⁽⁵⁾ Literature has shown that the combination of bone graft substitute and GTR treatment have better results as compared to GTR alone in terms of reduction in probing depth and greater gain in hard tissue probing at re-entry surgery.⁽⁶⁾ The clinical considerations important in selection of GTR with or without bone graft substitute are presence of adequate gingiva to cover the membrane, surgical access for root planning, placement of membrane and oral hygiene. GTR should not be performed in non-compliant patients who will not maintain adequate plaque control.⁽⁷⁾ In this case, the defect selected was ideal for GTR membrane placement and to achieve the best possible regeneration a combination with alloplastic bone graft substitute was placed.

Conclusion

A combination of a resorbable GTR membrane with alloplastic bone graft substitute in a properly selected defect results in excellent healing with evidence of bone fill. As a result of the constant innovations through research in the field of biomaterials to improve the predictability of periodontal regeneration it is likely that some combination technique may ultimately prove to provide the ideal regeneration.

References

1. Reynolds M, Aichelmann-Reidy W, Branch-Mays G. The efficacy of bone replacement grafts in the treatment of periodontal osseous defects. A Systematic review. *Annals of Periodontology* 2003;1:227-65.
2. Laurell L, Gottlow J, Zybutz M. Treatment of intrabony defects by different surgical procedures. A literature review. *Journal of Periodontology* 1998;69(Suppl.3):303-13.
3. Nevins ML, Camelo M, Nevins M. Human histologic evaluation of bioactive ceramic in the treatment of periodontal osseous defects. *International Journal of Periodontics & Restorative Dentistry* 2000;20(Suppl.5):458-67.
4. Murphy K, Gunsolley J. Guided tissue regeneration for the treatment of periodontal intrabony and furcation defects. A systematic review. *Annals of Periodontology* 2003;8:266-302.
5. Ian Needleman, Richard Tucker, E Giedrys-Leeper, Helen Worthington. Guided tissue regeneration for periodontal intrabony defects-a Cochrane Systematic Review. *Periodontology* 2005;2000;37:106-23.
6. Camelo M, Nevins M, Lynch S. Periodontal regeneration with an autogenous bone- Bio-Oss composite graft and a Bio-Guide membrane. *International Journal of Periodontics & Restorative Dentistry* 2001;21:109-19.
7. Hom-Lay Wang, R Lamont Mac Neil. Guided tissue regeneration: Absorbable barriers. *Dental Clinic North America* 2004;42(Suppl.3):505-22.