



Management of Infrabony Defect Using Gtr Membrane and Bone Graft Substitute: Case Report.

KEYWORDS

Infrabony defect, Chronic Periodontitis, GTR membrane, bone graft.

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ABSTRACT *Aim: The aim of this study was to evaluate the role of a resorbable membrane with a bone graft substitute in the management of an infrabony defect in a mandibular left first premolar in a patient with chronic generalized gingivitis with localized periodontitis.*

Methodology: An infrabony defect of 3 mm around the mandibular left first premolar was evident after debridement. The defect was filled up with a bone graft substitute (DBBM, Osseograft™) and covered with a resorbable GTR membrane (Healiguide™).

Results: The site showed significant bone fill at the end of 9 months with reduction in probing depth.

Conclusion: In this case, excellent results in terms of probing depth reduction and bone fill were obtained.

Introduction:

Periodontitis is defined as an inflammatory disease of supporting tissues of teeth caused by specific microorganisms or groups of specific micro organisms, resulting in progressive destruction of the periodontal ligament and alveolar bone with periodontal pocket formation, gingival recession or both¹. The goal of any periodontal therapy is the preservation of teeth in a functional and comfortable health. The conventional periodontal therapies are effective in eliminating infection and halt the disease progression. Periodontal regeneration is to restore the structure and function of the periodontium. It is the regeneration of the tooth's supporting tissues, including alveolar bone, periodontal ligament, and cementum over a previously diseased root surface².

The main aim of regeneration is to restore the architecture and function of periodontium in a state of health. To attain this goal various materials like bone grafts, GTR etc. have been tried.

The use of bone graft substitutes for treating bony defects resulting from periodontitis has been reported, evaluated and reviewed since the era of iliac bone grafting. However 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 periodontium³. Periodontal regeneration by GTR has been defined within the concept of "new attachment". Guided tissue regeneration (GTR) describes procedures attempting to regenerate lost periodontal structures through differential tissue responses. It typically refers to regeneration of periodontal attachment by barrier techniques in which epithelium and the gingival corium from the root is excluded in the belief that they interfere with regeneration².

Case Report

A 22 year old female patient reported to Farooqia Dental

College and hospital, with the chief complaint of pain and bleeding of gums in relation to lower left back tooth region since 10 days. Patient gave a history of food impaction and history of recurrent swelling in the same region since one year, which subsided on its own after sometime without any treatment. On examination there was a periodontal pocket of 6 mm on the distal aspect of mandibular first premolar (Fig. 1) and 5mm pocket on the mesial aspect of mandibular second premolar. There was no tenderness or pus discharge at the time of examination. Intra Oral Periapical radiograph revealed infrabony defect on distal aspect of 34 (Fig. 2).



Figure 1: Deep pocket on distal aspect of mandibular left first premolar



Figure 2: Infrabony defect on distal aspect of 34

Pre surgical protocol

The initial preparation phase for treatment consisted of oral hygiene instructions, scaling and root planning. Occlusal therapy and re-evaluation was done 4 weeks after the completion of phase I therapy.

Surgical Technique

The surgical procedure was carried out under local anaesthesia (2% lidocaine with epinephrine 1:80,000). Intrasulcular incision was given from 33 to 36 region. A full thickness mucoperiosteal flap was raised ensuring 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. After complete removal of the granulation tissue and complete debridement, a two walled defect of 3 mm was present in relation to 34 and 35 (Fig. 3). The bone graft substitute, demineralised bone matrix (DBBM, Osseograft™) which is an osteoconductive and osteoinductive graft material was placed in the defect to fill it completely (Fig. 4) and then

covered with a resorbable GTR membrane (HealiguidTM) (Fig. 5). The flap was then sutured using resorbable sutures, approximating it on both buccal and lingual aspects to completely cover the membrane. Periodontal surgical pack was placed to leave the area undisturbed for a period of 2 weeks.



Figure 3: Marked intrabony defect (arrow) and mesial to 34 and 33



Figure 4: Bone graft placed inside the defect



Figure 5: Resorbable membrane placed over the defect

Post surgical treatment and follow-up

The patient was given plaque control instructions that included use of 0.2% Chlorhexidine rinse twice daily to help control plaque control and to avoid tooth brushing in the operated area for one week. The periodontal dressing was removed at the end of one week and the area was re evaluated. The surgical site was gently debrided and irrigated with saline and re dressing was done. Both periodontal dressing and sutures were removed at the end of two weeks post operatively. The sutures had almost resorbed by then. 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 and 9 months. The symptoms of pain, bleeding, food impaction and swelling had reduced slowly over a period of 6 months. There was reduction in probing depth at the three month recall and by the 6 month recall the patient was comfortable with no recurrence of symptoms like swelling (Fig. 6). At the 6 month recall, radiograph showed significant bone fill, evident as increase in radiopacity (Fig. 7).



Figure 6: Tooth after 6 months probing depth



Figure 7: Radiographic image showing bone fill

Discussion

Regenerative procedures have focused on the elimination of hard and soft tissue defects (probing depths and osseous defects) by regenerating new attachments⁴. Many of these procedures include the use of bone grafts and bone-replacement materials to provide new attachment⁴. 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^{5, 6}. However, histologic evaluation of these bone graft substitutes has shown limited regenerative potential and these materials appear to function as non irritating fillers³.

The rationale of using GTR is based on the advantages offered by the GTR membrane. It excludes epithelium and gingival connective tissue, maintains space between the defect and tooth, and stabilizes the clot⁷.

A study by Sonis et al in 1983, evaluated the efficacy of demineralised bone powder for the treatment of periodontal defects at 6

months and found radiographic evidence of bone fill for 61% of the patients studied⁸. A recent meta-analysis systematic review by Murphy K et al in 2003 suggested that in the treatment of intrabony defects, GTR procedures, as compared with open flap debridement controls, resulted in significantly more favorable gains in CAL and PD reduction and in the treatment of furcation defects, GTR procedures, as compared with open flap debridement controls, resulted in significantly more favorable gains in vertical probing attachment level, reductions in vertical probing depth, and improvement in horizontal open probing attachment measurements⁹.

Laurel L et al in 1998, in their review analyzed treatment results of open flap debridement, bone replacement grafts (BRG), and GTR and found CAL gain (1.5, 2.1 and 4.2 mm) and bone fill (1.1, 2.2 and 3.2 mm) respectively for each treatment group and found that all treatments seem to leave a residual intrabony defect, however the shallowest remaining defects, around 1.5 mm, were found following GTR and suggested that GTR is an effective treatment modality for the management of intrabony defects¹⁰.

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 surgery¹¹.

In this case, the defect selected was ideal for GTR membrane placement and to achieve the best possible regeneration a combination with bone graft substitute was placed which showed reduction in probing pocket depth upto 2mm with a significant bone fill at the end of 9 months.

Conclusion

A combination of a resorbable GTR membrane with bone graft substitute in a properly selected defect results in excellent healing with evidence of reduction in probing pocket depth and significant bone fill.

References:

- Newman MG, Carranza FA, Takei H, Klokkevold PR. Carranzas clinical Periodontology. 10th ed. Elsevier health sciences;2006.
- American Academy of Periodontology. Glossary of Periodontal Terms. Chicago: American Academy of Periodontology;2001.
- Singh S. Management of a Circumferential infrabony defect using GTR membrane and bone graft substitute. Journal of Scientific and Innovative Research 2015; 4(2): 54-56.
- Gupta R, Pandit N, Malik R, Sood S. Clinical and Radiological evaluation of an Osseous Xenograft for the treatment of infrabony Defects. Journal of the Canadian Dental Association 2007;73(6):513.
- 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.
- 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.
- Academy Report. Position Paper.Periodontal regeneration. J Periodontol 2005;76:1601-1622.
- Sonis S, Kaban LB, Glowacki J. Clinical trial of demineralised bone powder in the treatment of periodontal defect. J Oral Med 1983;38(3):117-22.
- 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.
- 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.
- Needleman I, Tucker R, Giedrys-Leeper E, Worthington H. Guided tissue regeneration for periodontal intrabony defects-a Cochrane Systematic Review. Periodontology 2005;37:106-23.