

COMPARISON OF PERIOSTEUM EVERSION TECHNIQUE WITH GTR MEMBRANE AS A GRAFT WITH CORONALLY ADVANCED FLAP IN THE TREATMENT OF MILLER'S CLASS I GINGIVAL RECESSION DEFECTS

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Abstract

The most common mucogingival defect is gingival recession, which is characterized by apical displacement of the gingival margin from the cement-enamel junction and root exposure. Several techniques are available for treating gingival recession and are collectively termed as 'root coverage procedures.' This case report presents a comparison of periosteum eversion technique (PET) using periosteum as a graft and guided tissue regeneration (GTR) technique using GTR membrane as a graft with coronally advanced flap (CAF) in the treatment of Miller's class I gingival recession defects with cervical abrasion. It was observed that PET was more efficient in achieving adequate and aesthetic coverage of root.

Key Words: Coronally advanced flap, Gingival recession, Periosteum eversion technique, Surgical flaps.

INTRODUCTION

Gingival recession is characterized by the apical displacement of the free gingival margin from the cemento-enamel junction which results into root exposure.¹ This frequently encountered clinical condition may result in unpleasant esthetics, increased risk of root caries and dentin hypersensitivity.² Primary risk factors for gingival recession include traumatic brushing techniques, occlusal trauma, tooth crowding, high buccal or lingual frenum, plaque-induced gingivitis, ill-fitting restorations, inaccurate orthodontic movements and a thin cortical bone.³

Cervical abrasion depth, length of the gingival recession, presence of keratinized tissue, and most importantly, esthetic requirements of patients are some of the local anatomical features that affect the techniques used for root coverage in patients with gingival recession.^{4,5} The numerous techniques invented for the treatment of this condition include, laterally positioned flaps, GTR (guided tissue regeneration), free gingival grafts, and coronally advanced flaps (CAFs) with or without the interposition of a subepithelial connective tissue graft (SCTG).⁶

Advanced flaps are probably the simplest procedures for managing gingival recession. Norberg first proposed coronally positioned flap in 1926 as an esthetic surgical procedure for root coverage. Favourable root coverage, original soft tissue morphology recovery, color blending with the adjacent tissues of the treated area can be accomplished by this procedure. Although being less predictable in terms of successful outcome, the postoperative healing in advanced flaps is less troublesome for the patient as compared to free gingival or connective tissue grafts.⁶

Despite the numerous advantages of coronally advanced flaps, the main disadvantage of CAF alone is that it is not favourable to achieve adequate root coverage in most of the cases. However, the predictability can be increased by combining CAF or its modified approach with other techniques which may involve the use of connective tissue graft, enamel matrix derivative, synthetic allograft,

GTR membranes, platelet-rich plasma, platelet-rich fibrin (PRF).⁶

Alternatively, the host periosteum can also be utilized as a barrier membrane. The use of autogenous periosteum has been widespread in medical field and has shown promising results. It is a highly vascular connective tissue sheath containing numerous osteoblasts and osteo progenitor cells, and the outer layer is composed of dense collagen fibre, fibroblasts, and their progenitor cells. It releases vascular endothelial growth factor (VEGF) which promotes revascularization during wound healing.⁹ This case report presents a comparison of CAF with periosteum and GTR membranes for root coverage in teeth with cervical abrasion restored with GIC cement.

CASE REPORT

A 45-year-old male patient reported to Department of Periodontology with chief complaint of receding gums in his maxillary right and left back teeth region and sensitivity to hot and cold stimuli in the same teeth.

Clinical examination revealed good systemic health, with no history of drug abuse or smoking. Intraoral examination showed good gingival health and radiological examination revealed minimal interproximal bone loss. The bilateral maxillary canines and both 1st and 2nd premolars depicted gingival recession up to 3 mm, thick gingival biotype (Figure 1). Phase one therapy was performed and oral hygiene maintenance, proper brushing technique along with use of a soft tooth brush was emphasized, as improper technique of brushing was suspected as the primary cause of recession.



Figure 1 – Pre-Operative

The cervical abrasion area in the canines, 1st and 2nd premolars were planned to be restored using GIC resin and exposed root coverage using the coronally advanced flap subsequently with periosteum and GTR as a graft on the right and left sides of maxillary arch, respectively, sequentially to compare the clinical results of both the techniques.

On the right side of the maxillary arch in the canine and premolars area, horizontal incisions at the level of CEJ were given using No. 15C scalpel blade. Mesial and distal vertical releasing incisions extending beyond the mucogingival junction were given mesial to canine and distal to 2nd premolar. A full thickness mucoperiosteal

flap followed by sharp dissection in the apical area was done for coronal repositioning. (Figure 2A) At the first site, two vertical incisions and one horizontal incision in the apical most area of the soft tissue bed were given to elevate a periosteal membrane that was reverted back to cover the recession area. (Figure 2 B) On the contra-lateral site, the procedure for flap reflection (Figure 3A) was similar but a GTR membrane matching the dimensions of recipient bed was prepared and placed under the flap (Figure 3B). At both sites, mesial and distal papillae were de-epithelized and stabilized by sling sutures, while releasing incisions were approximated using simple interrupted sutures. (Figure 2C, 3C)



Figure 2a-After Flap Reflection; Figure 2b-After Revert Back of Periosteum; Figure 2c- Post Operative



Figure 3a-After Flap Reflection; Figure 3b-GTR Membrane Placed; Figure 3c-Post Operative

The patient was prescribed an analgesic and anti-inflammatory agent (aceclofenac 100 mg with Paracetamol 500 mg), antibiotics (amoxicillin with clavulanic acid, 625 mg and metronidazole 400 mg) for 5 days and mouth rinses (0.2% chlorhexidine, twice a day for 14 days), and postoperative instructions were given. The sutures were removed after 10 days. (Figure 4A, 4B) At the 1-month recall appointment, root coverage was observed on both the sides (Figure 5), with no dentin hypersensitivity and satisfactory esthetics. However, the extent of recession coverage and healing was better with respect to the periosteum technique.



Figure 4a, 4b- Post Operative After 10 Days



Figure 5- Post Operative After 1 Month

DISCUSSION

Gingival recession is defined as apical displacement of gingival margin and is commonly associated with cervical abrasion. Primary risk factors include traumatic brushing tooth crowding, high buccal or lingual frenum, plaque-induced gingivitis, ill-fitting restorations in the cervical region, causing gingival recession followed by dental abrasion.⁸

Poor esthetics will not only be resolved by the restoration of the defect because it results in an excessively long tooth. Similarly, mucogingival therapy used for root coverage alone cannot completely cover the abrasion; in consequence this may result in persistent dentinal hypersensitivity and plaque retention.⁹ Hence, a combined approach including both root coverage procedure and defect restoration would be ideal in such situations.

This case report presented a comparison of the coronally advanced flap with periosteum and GTR techniques for root coverage in teeth with cervical abrasion. It was observed that the periosteum technique was more effective in achieving sufficient and appealing root coverage.

To select one surgical technique over another primarily two factors should be considered, patient related factors and factors related to the defect. According to many

studies, gingival recession equal to or lesser than 3 mm has better prognosis for root coverage as compared to gingival recession more than 3 mm, therefore before selection of any case for treatment it should be essential to measure initial distance of gingival margin from the CEJ.⁹ Therefore in our case Miller's class I defects with thick biotype and adequate keratinized tissue were selected and a combined approach was used to treat the defects.

GTR membrane has an impressive nature and its use as a barrier membrane to promote periodontal regeneration in buccal gingival recession defects has gained popularity.⁷ However there are various disadvantages of GTR membrane i.e. its high cost, biodegradable rate that cannot be controlled, lack of stiffness which results into collapse of membrane and the most important its synthetic nature thus to overcome these disadvantages autogenous membrane has gained popularity.

The periosteum is a highly vascular connective tissue with massive regenerative potential. The use of periosteum as a membrane in the present case proved beneficial, since it displayed better quality of root coverage and better healing as compared to collagen membrane. These qualities make it a suitable autogenous graft.⁸ Better healing could be attributed to the release of VEGF by the periosteum. The main benefit of this technique is it requires only single surgical site, and single or multiple Miller Class I recessions, with adequate keratinized tissue width and thickness (at least 1mm) is suggested for the treatment.

Gingival recessions with deep cervical abrasions (> 1 mm), as in present case, require a restoration in combination with root coverage procedure as neither technique used alone would provide a satisfactory outcome. Root coverage without restoration alone may lead to poor aesthetics, soft tissue flap adaptation interference, reduced plaque control and sequential failure of the procedure.¹⁰

CONCLUSION

This case report indicates that the use of GIC resin to restore cervical abrasion with the coronally advanced flap with periosteum techniques achieves better aesthetics and root coverage when compared to the coronally positioned flap with GTR technique. Whereas to cover the teeth with receded gingiva both the techniques are considered appropriate or can be used to cover exposed root.

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How to cite this article: Jain S, Bhatia G, Krishna K M, Singhal D, Comparison of Periosteum Eversion Technique with GTR Membrane as a Graft with Coronally Advanced Flap in the Treatment of Miller's Class I Gingival Recession Defects, *TMU J Dent* 2019;6(1):29-31.