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# Guided tissue regeneration based root coverage with platelet rich fibrin

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**ABSTRACT**
The treatment of buccal gingival recession is a common requirement due to aesthetic concern or root sensitivity. The ultimate goal of a root coverage procedure is the complete coverage of the recession defect with good appearance related to adjacent soft tissues and minimal probing depth. The surgical techniques used for root coverage are based on tissue displacement, whether by translation (ie, pedicle flap procedure) or by grafting (i.e., free gingival or subepithelial connective tissue graft [SCTG] procedures). Grafting procedures have a major disadvantage due to need of a second surgical site, which increases patient discomfort. In this case a Miller Class I recession defect was treated using Platelet Rich Fibrin (PRF) applied underneath an absorbable barrier membrane in guided tissue regeneration (GTR)–based root coverage procedure covered by an coronally advanced flap.

**Keywords**: Gingival recession, Root coverage, Guided tissue regeneration, Platelet rich fibrin.

## INTRODUCTION

Gingival recession is a major esthetic problem if present on the buccal or labial surfaces of the teeth. It is associated with factors such as inflammatory periodontal disease, developmental anatomic abnormalities, toothbrush injury, tooth malposition, iatrogenic factors.[1] Recession results in a variety of complications such as root hypersensitivity, a higher incidence of root caries and diminished plaque control, thus necessitating treatment.

Over the years, multiple surgical techniques, for treating recession with predictable root coverage have been tried. The earliest techniques ranged from pedicle grafts and free auto grafts to combination of grafts (autografts or allografts) with the recent concepts of guided tissue regeneration (GTR) and involving growth factors by using platelet concentrates. The goals of treatment are to restore the tissue margin to the CEJ, establish an esthetic outcome while creating a normal gingival sulcus with functional attachment.[2]

In cases of anterior region with recession defects, pedicle grafts such as semilunar flap, coronally advanced flap (CAF) or lateral pedicle flap are still an ideal treatment modality, if there is sufficient with of keratinized gingiva at the site of defect. Amongst the other treatment modalities, subepithelial connective tissue graft (SCTG) is considered to be the gold standard. However, constrains with the amount of donor tissue, creating a second surgical site, post-operative discomfort and healing with a long junctional epithelium, mainly with limited connective tissue attachment.[3,4]

GTR with biodegradable collagen has been used to improve root coverage, gain in clinical attachment level and increase the width of keratinized gingiva.

The advantage lies in the fact that root coverage using GTR eliminates the need for a donor site and associated discomfort with no limitations on the supply of graft material.[5,6,7]

Platelet rich fibrin (PRF) is a second generation platelet concentrate and has been used widely to accelerate soft tissue and hard tissue healing. PRF affects cell biology activities on both the genetic and cellular levels.[8,9] Since the platelet concentrate has a higher number of platelets per millimeter, it should contain a higher concentration of growth factors to accelerate or enhance regeneration.[10] The combination of GTR and PRF have been widely used to treat Grade II furcation defects and infrabony pockets, which have shown predictable results. Hence in this case GTR and PRF were used with CAF to achieve root coverage.

## CASE REPORT

A 37 year old male patient reported with the complaint of hypersensitivity in the upper left teeth region. On examination, recession (Miller's Class I) in the upper left canine was seen (Fig.1).

Patient underwent oral prophylaxis. Since the patient's concern was esthetics, a treatment plan was established for correction of recession by surgical method.

Anesthesia was attained with 2% lignocaine HCl containing 1:80,000 adrenaline at the surgical site. A trapezoidal flap was raised with vertical incisions extending beyond the mucogingival junction. 3-4 mm apical to the crest of the osseous dehiscence, a partial-thickness flap was reflected which was continued as a full-thickness flap to enable the coronal displacement of the flap. Following this root biomodification was done using tetracycline and the mesial and distal interdental papillae were de-epithelized.

### Preparation of Platelet Rich Fibrin (PRF)

10 ml of blood was drawn intravenously from the antecubital vein of the patient and centrifuged for 12 minutes at 3200 rpm. The PRF clot was separated from the resultant product.

PRF was placed over the denuded root surface (Fig.2). The sterile biodegradable collagen membrane was trimmed and contoured as needed to cover the recipient site. The membrane was placed over the PRF, extending from 2-3 mm apical to the crest of the osseous dehiscence to 1 mm coronal to the CEJ. It was secured in position with 4-0 absorbable suture (Fig.3).

The flap was coronally advanced over the membrane to completely cover it and secured with sutures. Periodontal dressing was placed. Post-operative antibiotics and analgesics were prescribed. Post-operative instructions were given to the patient. Patient was recalled at regular intervals.

The patient presented with minimal postoperative edema and pain. The healing was uneventful and hypersensitivity subsided after two weeks. Three months later, the treated site presented with harmonious color match with the surrounding gingiva and complete coverage of gingiva in the recession defect (Fig.4).

## DISCUSSION

Surgical root coverage procedures are aiming to attain the best esthetic results while not only considering restoration of the tooth but also health and functionality of the periodontal soft tissues. Gingival recession is one of the most common esthetic and functional concerns associated with the periodontal tissues.[11] Root coverage is indicated to cover unaesthetic, painful, or exposed root surfaces and/or to prevent disease progression in areas where hygiene cannot be adequately maintained.[12]

Among the various prospects available for treatment of deep and narrow recession defects, CAF with GTR and PRF provide a good solution. The benefits of using a CAF for root coverage are single surgical site with sufficient blood supply and amiable color and texture matching the surrounding tissues all of which provide highly esthetic results.

GTR therapy stimulates new attachment formation over denuded root surfaces. GTR treated sites have also shown formation of new bone, new cementum, and new periodontal ligament.[13]

PRF provides growth factors that augment wound healing in periodontal tissues. PRF is also able to stimulate Type I collagen synthesis and since the platelet concentrate has a higher number of platelets per millimeter, it also contains a higher concentration of growth factors to accelerate or enhance regeneration.[10] When PRF is used with a membrane,



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need for a donor site is eliminated, making this technique less invasive. There is less postsurgical discomfort, more rapid soft tissue healing with less edema compared to the SCTG techniques, and a relatively unlimited source of graft material.

## CONCLUSION

The choice of surgical technique depends on several factors and the clinician should choose from among the different surgical protocols available, selecting the least traumatic to the patient with the best treatment outcome. The use of CAF with GTR and PRF may be an effective and less invasive way of treating gingival recession defects. Nevertheless, it is imperative that further clinical and histological studies are performed to study the effectiveness of this technique.

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## FIGURES & LEGENDS

**Figure 1:** Pre-operative (3mm recession defect measured using William's probe)

**Figure 2:** PRF placed over the defect

**Figure 3:** GTR membrane sutured

**Figure 4:** Post-operative 3 months



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