CASE REPORT

Management Of Multiple Gingival Recession Defect Using Coronally Advanced Flap Alone Or With PRF Membrane

Neetu Rani¹, Surendra Singh², Rachita Arora³, Nandlal⁴, Amitabh Srivastava⁵

¹ Senior Resident, Department of Periodontology, Faculty of Dental Sciences, King George’s Medical University, Lucknow, India.
² Resident, Department of Periodontology, Faculty of Dental Sciences, King George’s Medical University, Lucknow, India.
³ Private Practitioner, New Delhi.
⁴ Professor & Head, Department of Periodontology, Faculty of Dental Sciences, King George’s Medical University, Lucknow, India.
⁵ Professor & Head, Department of Periodontology, Sardar Patel Post Graduate Institute of Dental & Medical Sciences, Lucknow, India.

Abstract: Platelet Rich Fibrin (PRF), a second generation platelet concentrate is a recent innovation in dentistry. The growth factors present in PRF accelerate the wound healing and also are regarded as promoters in regeneration of hard and soft tissue. PRF membrane used in treatment of gingival recession provides enhanced early wound healing, acceptable clinical outcome and minimum patient discomfort. The aim of this report was to find out the clinical outcome of root coverage using coronally advanced flap with or without platelet rich fibrin (PRF) membrane.

Key words: Platelet rich fibrin, Gingival recession, Coronally advanced flap

Introduction

Gingival recession is defined as location of gingival margin apical to cemento-enamel junction (Glossary of Periodontology, 4th edi.).¹ Recession of marginal gingiva can be a rationale for various functional and esthetic problems.² Clinically, it has been related to root caries, attachment loss, hypersensitivity and esthetic concerns. The prevalence of gingival recession ranges from 20% to 100% in adults.³-⁶ Vigorous tooth brushing is considered to be one of the predominant causative factors for development of gingival recession. However, other factors, such as frenum pull, minimum attached gingival width, tooth brush trauma, inflammation related to plaque, soft tissue ablation, tooth mal position and iatrogenic factors are also responsible for the recession.⁷ Miller⁸ proposed a classification system in 1985 and probably is the most widely used for describing the gingival recession.
- **Class I** - Marginal tissue recession not extending to the mucogingival junction. No loss of interdental bone or soft tissue
- **Class II** - Marginal tissue recession extend to or beyond the mucogingival junction. No loss of interdental bone or soft tissue
- **Class III** - Marginal tissue recession extend to or beyond the mucogingival junction. Loss of interdental bone or soft tissue is apical to CEJ but coronal to the apical extent of marginal tissue recession
- **Class IV** - Marginal tissue recession extends beyond the mucogingival junction. Loss of interdental bone extends to level apical to the extent of marginal tissue recession

Gingival recession may be localised to a single tooth or may involve multiple teeth. In multiple adjacent recession type defects (MARTD) the root surface area exposed to the oral cavity is more extensive. Additionally, some anatomical considerations such as thin biotype, decreased keratinized tissue width (KTW), root prominence and root proximity make the choice of surgical treatment difficult as compared to localized gingival recession type defects.

Numerous periodontal plastic surgical procedures have been proposed in the treatment of gingival recession defects with varying degree of predictability and success rates. The laterally positioned flap technique, free gingival graft technique, connective tissue graft technique, coronally positioned flap technique and acellular dermal matrix technique have been used to enhance esthetics and reduce hypersensitivity of exposed root surface. Coronally advanced flap (CAF) introduced by Norberg(1926) is an easy and more
predictable esthetic surgical procedure for treating recession, and it also eliminates the need for second surgical site. The average root coverage achieved with this technique ranges from 75% to 82.7%, with 24% to 95% of sites achieving complete root coverage.\textsuperscript{12} Subsequently, various adjunctive agents have been applied to promote healing and further enhance clinical outcomes. So as to increase the effectiveness of the root coverage treatment and improve clinical outcomes, addition of various biomimetic agents have been introduced such as; enamel matrix derivative (EMD) (Ito et al. 2000, Pilloni et al. 2006); platelet rich plasma (Petrungaro 2001); platelet rich fibrin (PRF) (Aroca et al. 2009).\textsuperscript{13} **Platelet rich fibrin (PRF)** Platelet-rich fibrin, a second generation of platelet concentrates was first developed in France by Choukroun et al\textsuperscript{14} for specific use in oral and maxillofacial surgery. Unlike other platelet-rich products, this technique does not require an anticoagulant or bovine thrombin. PRF is an intimate congregation of cytokines, glycanic chains, and structural glycoproteins enmeshed within a fibrin network with synergetic effects on healing processes\textsuperscript{7}. PRF is an organized dense fibrin scaffold with a specific slow release of growth factors such as TGF-β1, PDGF-AB, and VEGF and glycoproteins such as thrombospondin over 7 days. Favourable effects of PRF have been studied in various procedures, such as facial plastic surgery, a sinus-lift procedure, multiple gingival recession with a coronally displaced flap and furcation defects & intra bony defect\textsuperscript{15,16}. This report presents two cases of multiple adjacent gingival recessions treated by CAF alone and combined CAF-PRF novel technique.

**Case report**-
Two male patient with mean age of 42 years, reported to the department of
periodontology, Faculty of Dental Sciences, King George’e Medical University, Lucknow, with chief complaint of receding gums and sensitivity to hot and cold in relation to upper anterior teeth. Clinical examination revealed a class I/II Miller’s defect in relation to multiple maxillary anterior teeth (fig 1 and 4). No relevant medical and dental history was reported. Patients were divided in two; case 1 and case 2 by flip of coin method. Case 1 was selected to be treated with CAF only and case 2 was treated with CAF with PRF membrane.

**Pre surgical therapy**

The surgical procedure was explained to the patient and a written informed consent was obtained. Presurgical preparation includes full mouth supra gingival and subgingival scaling and root planing and provision of oral hygiene instructions. Prior to surgical procedure, routine blood investigation was done in both the patients who came under the normal limits. Four weeks following Phase 1 therapy, a periodontal re-evaluation was performed to confirm the suitability of the site for periodontal surgical procedure.

**Surgical procedure:**

The facial skin all around oral cavity was scrubbed with povidine iodine solution and 0.2% chlorhexidine digluconate was used for intraoral antisepsis. Following local anesthesia by using 2% xylocaine with adrenaline, crevicular incisions were made and coronally advanced flap technique was performed at the surgical site. This site was delineated by two oblique releasing incisions at the mesial and distal aspects and sulcular incisions around the affected tooth. A full thickness flap was reflected beyond the mucogingival junction to expose at least 3 mm of the marginal bone apical to the dehiscence area. A horizontal releasing incision was made in the
periosteum at the base of the flap to facilitate tension free coronal advancement of the surgically created flap. The exposed root surfaces were scaled and root planed.

**In case 1** - The flap was coronally advanced to cover the denuded root surfaces and sutured (fig 2 & 3). The periodontal dressing was placed over the surgical area.

![Fig 1. Pre-operative in case I, gingival recession defect in 12 and 13.](image1)

![Fig 2. Surgical site delineated with two oblique releasing incisions at the mesial and distal aspects and sulcular incisions around the affected tooth and full thickness flap elevated.](image2)

In Case 2 - This case was treated with CAF technique in combination with PRF membrane.

**Preparation of Platelet Rich Fibrin membrane:** After the recipient site preparation was completed, the required quantity of blood was drawn from median cubital vein of right arm in a 15 ml test tube without an anticoagulant and centrifuged immediately using a table top centrifuge (Systonic Lab and Scientific Instruments, INDIA) for 12 minutes at 3000 rpm. The resultant product consisted of following three
layers: Top most layer of PPP (platelet poor plasma), PRF clot in the middle, RBC at the bottom. PRF clot was then taken out of the test tube and was separated from the RBC’s layer by cutting with the help of scissors. PRF was then obtained in form of membrane by squeezing it in between two sterilized gauze piece.

At the recipient site in case- 2, the PRF membrane was placed over the denuded root surfaces (fig.6) and then the flap was coronally advanced and sutured (fig 7). A periodontal dressing was placed over the surgical area.

Fig4. Pre-operative: Gingival recession in 22, 23 and 24 in Case II.

Fig5. Full thickness flap reflected to expose 3mm of the marginal bone apical to the dehiscence area.

Fig6. PRF membrane placed to cover recession defect.

Fig7. Flap was coronally positioned to cover the defect and suture placed.
Post operative care:
Subjects were prescribed with antibiotics and analgesic (Novamox LB 500 mg and Ibuprofen 400 mg 8 hourly for 5 days) along with 0.12% chlorhexidine gluconate mouthwash twice daily for 4 weeks. Patients were instructed to refrain from tooth brushing and interdental cleaning in the treated area and dressing and sutures were removed 15 days after surgery. Gentle brushing with a soft toothbrush was advised, and the patients were re-instructed for the maintenance of proper oral hygiene. At the end of 3 month, clinical examination was done. In both cases, the recession defects showed signs of satisfactory healing and complete root coverage was accomplished without any post-operative complication. Although improvement was better in case treated with CAF with PRF membrane (fig 8 and 9).

![Image](image8.png)

Fig8. Case I: clinical photograph at 3 month post-op.

![Image](image9.png)

Fig9. Case II: Post-operative clinical photograph at the end of 3 month.

Discussion-
The ultimate goal of muco-gingival plastic surgery is predictable and aesthetic root coverage. The main objective of using PRF as a membrane lies in the fact that the α-granules of platelets are a reservoir of many growth factors that are known to play a key role in regeneration of hard and soft tissue. Various
growth factors present in PRF are platelet-derived growth factors (PDGFs), transforming growth factor beta (TGF-â), vascular endothelial growth factor (VEGF), insulin like growth factor-1 (IGF-1) and epidermal growth factor (EGF). Platelet-derived growth factors shows chemotactic and mitogenic properties that promote and modulate cellular functions involved in tissue healing and regeneration, as well as cell proliferation mechanisms.\(^{19}\)

The outcome of this study showed that both technique, either CAF or CAF with PRF membrane, are effective for treatment of gingival recession defects. In case 1 gingival recession defect was treated with CAF and result of the study showed significant root coverage but an additional gain in gingival/ mucosal thickness was not reported when compared to case 2. In Case 2 multiple gingival recessions were treated with coronally advanced flap procedure with the combination of PRF and found the significant improvement during the early periodontal healing phase and complete root coverage, with a thick and stable final remodelled gingiva. Del Corso M et al evaluated the use of PRF in the treatment of multiple gingival recession defects with coronally advanced flap procedures and found significant improvement during the early periodontal healing phases with a thick and stable, final remodelled gingival.\(^{20}\) In the same year, Aroca S et al reported inferior root coverage of about 80.7% at the test site (CAF+ PRF) as compared to about 91.5% achieved at control site (CAF), but an additional gain in gingival/ mucosal thickness compared to conventional therapy\(^{13}\). An enhance in thickness of the keratinised gingival tissues as reported in case 2 may contribute to a long term stable clinical outcome with reduced
probability of recurrence of gingival recession.

**Conclusion**

This case report demonstrates that PRF membrane, in combination with a coronally repositioned flap procedure, is safe and effective biomaterial for coverage of multiple recession defects and has ability to increase the thickness of the keratinised gingival tissue.

**References:**


Corresponding author details:
Name: Dr. Neetu Rani
Email id: neeturani0283@gmail.com