



Platelet Rich Fibrin: A Propitious Approach for Root Coverage- A Report of Two Cases

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ABSTRACT

The aim of this case report was to indicate a proper treatment strategy such as employing of Platelet Rich Fibrin (PRF) membrane in association with a coronally positioned flap for the management of mucogingival defects like gingival recession. Ideal esthetic results with outstanding soft tissue contour and consistency were seen. However this technique of using PRF warrants further investigation.

Keywords: Coronally Advanced Flap, Platelet-derived growth factors, Platelet-rich Fibrin, Root coverage.

INTRODUCTION

Gingival recession and inadequate keratinized gingiva lead to major functional and esthetic difficulties like increased incidence of root caries, clinical attachment loss, dentinal hypersensitivity and smile-related problems. Etiological factors implied are alveolar bone dehiscences [1], quality and quantity of gingiva, frenal pull, [2] traumatic tooth brushing and malpositioned teeth. Among these, the last two causes are predominant for gingival recession. [3] Consequently, gingival recession is observed both as gingival as well as alveolar defect. It can be managed surgically by techniques such as translation (i.e., pedicle flap) or grafting (free gingival or connective tissue graft [CTG]). These two procedures can be altered by combining with regenerative tissue-engineered membranes. The goals of these techniques are to increase the thickness of

gingiva, achieve optimal color match, and near-perfect aesthetics.

Review of literature has shown that better results were obtained by using CTG rather than guided tissue regeneration (GTR). [4] Subepithelial CTG is nowadays considered as the most accountable technique to obtain root coverage, without hampering aesthetics. [5] However, this procedure has certain disadvantages like the need for additional surgical site, and its technical difficulty. [6] Hence, there always existed a need for suitable alternative.

Platelet-Rich Fibrin (PRF): PRF is an enhanced concentrate of platelets derived from centrifuged blood. It affects cellular activities at genetic and molecular levels. [7] The influence of growth factors found in PRF is complex in that they interact and regulate each other's effect. Platelet-derived growth

factors (PDGF) -AA and -BB are major mitogens for periodontal ligament cells. Transforming growth factor (TGF)- β has a significant action in mitogenic and immunogenic response. [8] Fibrin clot derived from PRF stimulates Type I collagen synthesis. PRF has more number of platelets per millilitre (mL) and so contains more concentration of growth factors to intensify regeneration. [8] When using PRF membrane, donor site is not required, thereby making this procedure minimally invasive. This procedure reduces postoperative discomfort, enhances soft tissue healing with decreased edema when compared with subepithelial CTG technique.

CASE REPORT 1:

A 44-year-old male patient visited our department with a complaint of sensitive tooth in the upper front region of his mouth. Intra-oral examination revealed Class I gingival recession in relation to the maxillary left canine with a probing depth of 2mm and attachment loss of 5mm (Figure-1). Adequacy of vestibular depth and keratinized tissue prompted the placement of PRF membrane (Figure-2) combined with a coronally advanced flap.

Surgical procedure: Following proper isolation, the operative site was anaesthetized using 2% Lignocaine hydrochloride with Adrenaline (1:200000). Two vertical incisions were given on either side of the recession defect, which were extended beyond mucogingival junction. A sulcular incision was given to connect the two incisions. A full thickness mucoperiosteal flap was reflected, which was followed by root planing of canine.

Preparation of PRF membrane: Required quantity of blood was drawn from patient's right antecubital vein, into 10mL test tubes. They were centrifuged immediately for 12min at 2,700 revolutions per minute. The resultant product consisted of following three layers: Top most layers consisting of serum, Fibrin clot in the middle, and RBCs at the bottom. The fluid inside fibrin clot was squeezed out to produce PRF membrane, which was gently placed underneath the full thickness mucoperiosteal flap (Figure-3). The flap was coronally repositioned and secured in place using direct interrupted sutures. Periodontal dressing was placed.

Post-operative care: After surgery, the patient was placed on Amoxicillin 500mg tid, Hifenac bid for 5

days and 0.12% of Chlorhexidine digluconate mouthrinse for 4 weeks. Post-surgical instructions were given. Periodontal dressing and sutures were removed 10 days after surgery. Post-operative review after one month revealed good color match and a gain in clinical attachment levels (Figure-4).

CASE REPORT 2:

A 19 year-old man reported to our department with a complaint of receding gums in the upper front tooth region. Intra oral examination showed 3mm of gingival recession on the labial aspect of maxillary left canine. Similar surgical technique was followed as in first case. Post operative review revealed a gain in clinical attachment levels with restoration of physiological gingival contour.

DISCUSSION:

The aim of periodontal therapy is regeneration of periodontal tissues. Though the bilaminar technique with subepithelial CTG provided exceptional results in root coverage, it histologically showed uncertain regeneration. This has led to investigations on techniques with more regenerative potential. A recent innovation in dentistry is PRF, a concentrated suspension of growth factors that are involved in wound healing, thereby promoting tissue regeneration. PRF is produced from autologous blood by a process called Plasmaphoresis. It was first developed in France by Choukroun et al. [9] Since it is both non-toxic and non-immunogenic, PRF can be used along with bone graft for improved gingival and alveolar regeneration. Placement of PRF membrane in recession defects restores functional and esthetic properties of labial gingiva of maxillary anterior teeth. [9]

PRF belongs to a recent generation of platelet concentrates with simplified processing. On centrifugation, degranulation of platelets occurs, leading to cytokine release. Slow fibrin polymerization while processing PRF gives rise to intrinsic incorporation of platelet cytokines and glycolic chains within fibrin meshes. This result hence showed that PRF would be able to accelerate release of cytokines during fibrin matrix remodelling, unlike other platelet concentrates. This mechanism explains healing properties of PRF. [10]

Regarding aforementioned case reports, total root coverage was obtained in a minimally invasive way.

CTG mandates graft harvesting from a different site, which requires proficiency and is time taking, whereas, PRF requires no second surgical site. The color, contour and texture of the recipient site are enhanced and blend gradually with the adjacent tissues.

CONCLUSION:

The two cases presented showed that the utilization of platelet concentrate has been an effective and minimally invasive way for the treatment of gingival recession in comparison with the traditional autogenous graft. Ideal esthetic results with an outstanding gingival soft tissue contour and texture were obtained in these cases. Future longitudinal studies should be conducted on the present technique to evaluate its short-term and long-term effectiveness.

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FIGURE LEGENDS:



Figure 1: Pre-operative picture showing gingival recession in maxillary left canine

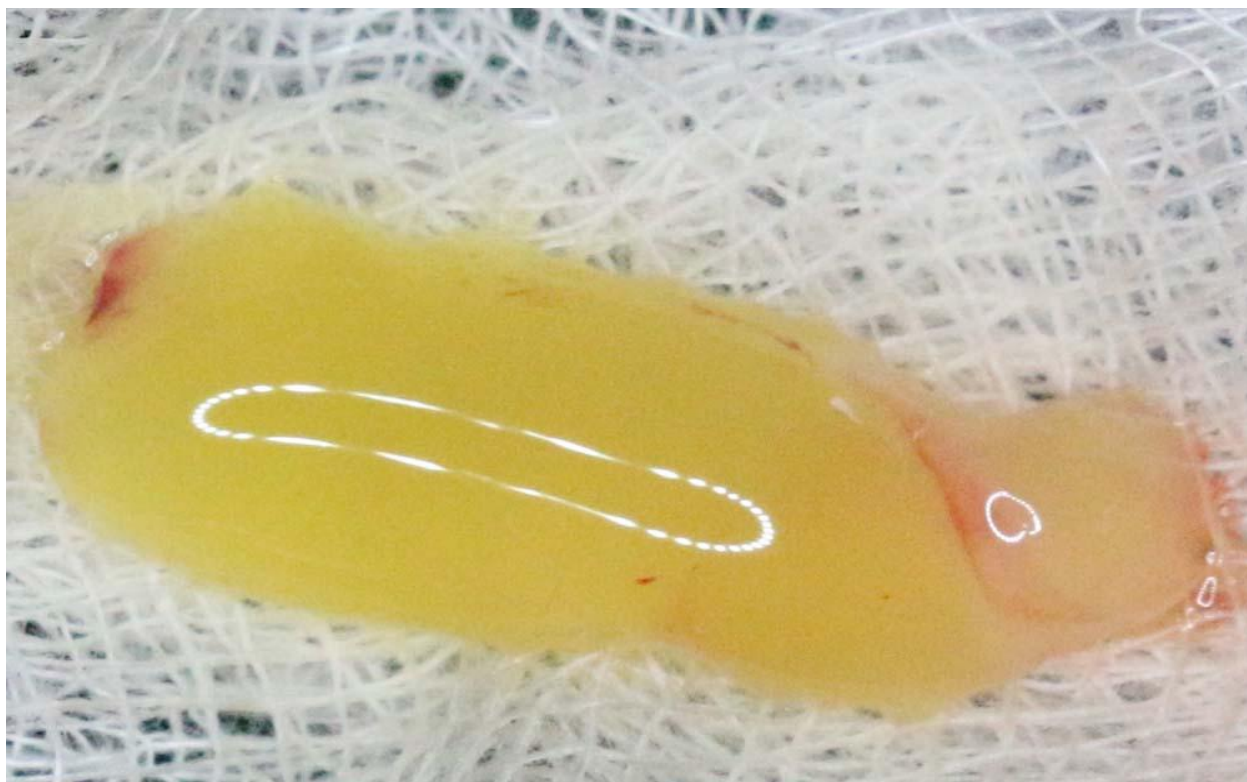


Figure 2: Platelet-rich Fibrin



Figure 3: Flap elevation and PRF placement



Figure 4: 10 days post-operative picture