

ROOT COVERAGE USING THE CORONALLY POSITIONED FLAP WITH OR WITHOUT PLATELET RICH FIBRIN

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ABSTRACT:

Root coverage procedures are usually indicated to achieve better esthetics. Many different surgical procedures have been used to achieve root coverage with varying degrees of success. This case report suggests that the Coronally positioned flap (CPF) when used in combination with regenerative materials like Platelet rich fibrin (PRF) can attain both regeneration of functional attachment apparatus and root coverage.

Key words: Esthetics, Coronally positioned flap, Platelet rich fibrin, Root coverage, Regeneration

INTRODUCTION:

Gingival recession is defined as the displacement of the marginal tissue apical to the cemento-enamel junction(1). Marginal tissue recession are at a higher risk of buccal tactile and thermal hypersensitivity, root abrasion and deterioration of smile aesthetics (2).

Several surgical modalities have been reported in literature for obtaining predictable root coverage. These procedures range from extensive procedures like free mucosal grafts (3) to simple procedures like coronally positioned flap (4,5,6). Coronally positioned flaps (CPF), in spite of having the benefits of predictable recession coverage with apparently satisfactory esthetic results (7, 8) have been found to be unstable on long term (9). Therefore CPF is frequently combined with various regenerative materials and biologic factors aiming to attain both regeneration of functional attachment apparatus and root coverage.

Platelet-rich fibrin (PRF) is a second generation platelet concentrate. PRF predominantly consists of a fibrin matrix rich in platelet and leukocyte cytokines such

as IL-1 β , -4, and -6, and growth factors such as TGF- β 1, PDGF-AB, and VEGF (10). The combination of fibrins and cytokines within PRF makes it a powerful bioscaffold with an integrated reservoir of growth factors for tissue regeneration (11).

In the case described in this article, the outcome of gingival recession therapy was compared using CPF alone or in conjunction with platelet rich derivative (PRF membrane) in a split-mouth design.

CASE REPORT:

A 32-year male reported to the Department of Periodontology, Faculty of Dental Sciences, KGMU with the chief complaint of unesthetic appearance in the maxillary front tooth region for 2 months. The patient was systemically healthy. He brushed twice daily with a soft toothbrush and toothpaste. Clinical examination revealed Miller's Class I recession in maxillary left lateral incisor, canine and premolar (test sites) and Miller's Class I recession in maxillary right lateral incisor, canine (control sites) [fig 1,2]. There was minimum amount of plaque seen and the gingiva was free of inflammation.

Initial therapy

Initial periodontal therapy consisted of oral hygiene instructions and thorough scaling and root planing. After 4 weeks the patient was recalled and taking into consideration the amount of vestibular depth and the presence of optimal quantity of keratinized tissue available, CPF and PRF membrane combined with CPF was considered as the treatment option at control and test sites respectively. The purpose and design of the procedure was explained to the patient and an informed consent form was signed.

Surgical procedure

Intraoral antisepsis was performed using 0.12% chlorhexidine rinse. Anesthesia was achieved with lidocaine 2.0% with 1:100,000 epinephrine. For the control sites, the flap was started with an intrasulcular incision at the vestibular aspect of the involved teeth and extended horizontally to the centre of the interdental gingiva, at CEJ level, mesial and distal to the defect. Two oblique apically divergent relaxing incision extending beyond the mucogingival junction complete the flap design.

A full thickness trapezoidal mucoperiosteal flap was elevated until the crest of marginal bone was reached on the midbuccal aspect of the tooth under treatment, then a split thickness flap was extended further apically to allow the flap to be positioned coronally at CEJ without tension.*[fig3]*

The vestibular epithelium of the interdental papillae was removed to provide a proper wound bed for healing. Then the flap was coronally advanced so that the tissue margin slightly covered the CEJ. Flap was now sutured passively into position using 4.0 silk sutures (Ethicon) *[fig 5,6]*. A piece of dry foil was placed over the sutures. Area was covered with a non-eugenol periodontal dressing (Coe-Pak)

For the test sites the procedure was identical to the one described, except for the addition of PRF .Prior to surgery, blood were drawn from the patient and placed in anticoagulant free test tube and was centrifuged. Blood was centrifuged using a tabletop centrifuge (Systonic Lab and Scientific Instruments,INDIA) for 12 minutes at 3,000 rpm. The PRF gel was compressed in order

to obtain membrane. The PRF membrane was placed over the denuded roots*[fig 4]* The primary flap was then advanced coronally over the membranes and sutured delicately.

Postoperative Protocol

Patient was prescribed antibiotics, amoxycillin 500 mg (Cap Novamox LB) one capsule three times a day for 5 days and analgesics, ibuprofen and paracetamol combination (Tab Combiflam) one tablet three times a day for 3days. The patient was put on chlorhexidine mouthwash 0.2% (Hexidine) for 2 weeks. Patient was instructed to abstain from brushing and flossing until suture removal. They were also instructed to avoid any mechanical trauma to the treated sites. Both the dressing and sutures were removed 10 days after surgery.

RESULTS:

Postoperative review of test sites at 6 weeks revealed complete root coverage on all three teeth with restoration of physiological gingival contour as compared to control sites. *[fig7,8]*

DISCUSSION:

The objective of root-coverage procedures consists in the complete resolution of the recession defect, with minimal probing depths after treatment, along with an aesthetic outcome which results in a complete blending of tissue colour and texture of the treated area with the adjacent soft tissues (12).There is extensive data in the literature which provides an insight into the various surgical modalities used for the treating gingival recession. But limitations of these procedures are lack of predictability, compromised blood supply, postoperative discomfort, and postoperative morbidity. CPF is easy, more predictable and reliable surgical procedure for treating recession (2,13,14) and it also eliminates the need for second surgical site. The aesthetic results are competitively better than free autogenous soft tissue grafts.

Graziani F et al(14) reported in the systematic review that the best treatment in terms of root coverage (recession reduction) was associated with the usage of CPF and a grafting procedure. Grafting may provide a scaffold to support wound healing and an increase of thickness of the wound area, favouring coverage (15). This specific feature influenced the decision to use platelet concentrates(PRF) as the grafting material of choice in this case report.

PRF is superior to other platelet concentrates like PRP due to its ease and inexpensive method of preparation and also it does not need any addition of exogenous compounds like bovine thrombin and calcium chloride. It is advantageous than autogenous graft also because an autograft requires a second surgical site and procedure. Platelet rich fibrin has been claimed to enhance soft tissue healing, promote initial stabilization, revascularization of flaps and grafts in root coverage (16,17).

Significant root coverage noted at sites treated with CPF in conjunction with PRF in this report could be attributed to the fibrin matrix of PRF which shows mechanical adhesive properties and biologic functions like fibrin glue: it maintains the flap in a high and stable position, enhances neoangiogenesis, reduces necrosis and shrinkage of the flap, and guarantees maximal root coverage(18). It also stimulates the gingival connective tissue on its entire surface with growth factors and impregnates the root surface with key matrix proteins for cell migration (fibronectin, vitronectin, and thrombospondin-1).

CONCLUSION:

PRF is significantly superior in treatment of gingival recession compared to Coronally positioned flap alone. It may also provide as a useful substitute for connective tissue graft procedures for root coverage.

Statement of Competing Interests:

The authors have no competing interests.

List of Abbreviations:

CPF : Coronally Positioned Flap

PRF: Platelet Rich Fibrin

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Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 8

Captions:

Figure 1: Pre-operative view (control sites)

Figure 2: Pre-operative view (test sites)

Figure 3: Intra-operative view (control sites)

Figure 4: PRF membrane placed over denuded roots (test sites)

Figure 5: Flap sutured (control sites)

Figure 6: Flap sutured (test sites)

Figure 7: Postoperative view after 6 weeks (control sites)

Figure 8: Postoperative view after 6 weeks (test sites) showing complete root coverage

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