

“I-PRF Incorporated Absorbable Collagen Membrane for GTR based Recession Coverage: A Case Report”

Abstract:

Introduction: Gingival recession defects in esthetic zone demands a concurrent correction of all the involved teeth in a single surgery. Wound healing is a complex phenomenon and the concurrent use of collagen membrane and Injectable Platelet rich fibrin (I-PRF) will greatly enhance the process. Thus the aim of this case report is to evaluate the effectiveness of Coronally advanced flap (CAF) with collagen and I-PRF in the management of gingival recession management. There was 90% mean root coverage and good patient esthetic satisfaction. Thus CAF with collagen and PRF is an effective treatment modality in the management of multiple gingival recession.

Case presentation: A 45-year-old man was referred to the department of periodontics for the treatment of Miller's Class II recession. The root coverage procedure was performed by a coronally advanced flap combined with collagen membrane and I-PRF. The case was followed up for 6 months.

Conclusion: The technique of CAF with collagen and I-PRF is feasible and useful method for treating several deep recessions.

Key-words: guided tissue regeneration

Introduction:

Gingival recession (GR) with root surface exposure is a substantial therapeutic issue for clinicians and must frequently be rectified if an aesthetic smile ought to be obtained. In addition, the proportion of avascular area to also be covered in these sorts of abnormalities is significantly greater, further confounding the situation.[1] As a result, periodontal plastic surgeries that treat recession problems at same time are now the clinician's preferred choice. Among the several surgical alternative possibilities, coronally advanced flap (CAF) is a commonly utilised approach, particularly in the treatment of GR.[2] Along with the surgical approaches, growth factors (GFs) plays a very crucial role in regeneration.

Plateletrich plasma (PRP) is a plasma fraction that contains a high concentration of growth factors such as platelet derived

GF, transforming GF- β , and vascular endothelial Gfs.

Platelet rich fibrin (PRF) has found to emit more GFs over longer time span. Initially PRF preparations had inadequate liquid protein concentrates, as standardized PRF includes bulk of GFs concentration trapped within fibrin matrix.[3] As a result, significant improvements and breakthroughs have

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recently been undertaken with goal of establishing a liquid form of PRF i.e (I-PRF).[4] Recent research has shown that, despite minor increase in blood cell and growth factors concentration; I-PRF was able to induce high cellular migration, m-RNA expressions of TGFβ-, PDGF, osteocalcin s well as considerable increase in collagen (type I) when compared with PRP, as an outcome, it acts as a dynamic gel with increased growth factor release for up to ten days.[5]

Furthermore, collagen membrane is an excellent bio-healing material that mimics natural repairing. In periodontal recession therapy, the notion of guided tissue regeneration (GTR) has given clinicians hope for complete regeneration.[6]

To our knowledge, no data on treatment of Miller's Class I or II recession using collagen membrane and I-PRF with CAF has ever been published. The present study includes a case report of gingival recession treated with CAF with collagen membrane and I-PRF.

Material and Methods:

A 45-year-old male patient underwent to the Periodontics department for normal tooth cleaning. The patient showed Miller's Class II gingival recession defects in the maxillary right canine (13) and premolar (14) (Fig. 1. a) on examination. A periodontal probe was used to assess recession depth (RD) from apical region of the gingival edge to cemento-enamel junction. The gingival recession was induced by the patient's incorrect tooth cleaning, since he had a history of brushing his teeth with a firm brush in a horizontal direction. The patient was a systemically healthy and non-smoker.

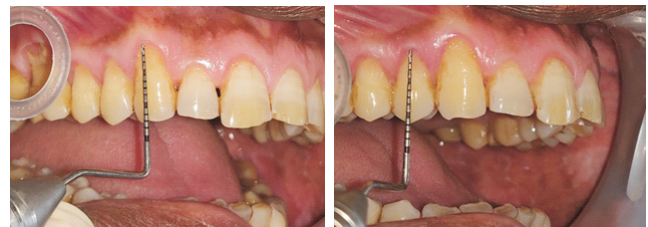
After phase I treatment, patient was educated regarding proper brushing technique along with other oral hygiene measures. CAF was planned for repair of gingival recession in respect to 13 and 14. The clinical process was described to patient and an informed consent was taken. Under local anesthesia, two vertical incisions were made starting from adjacent teeth on both sides which extended beyond the mucogingival junctions. The diseased pocket wall was then removed by making an internal bevel incision from gingival edge to bottom of the pocket and sharp dissection was used to elevate the flap. Curettes were used for root surface debridement, which was then irrigated with sterile saline solution. Before placing collagen membrane to defect areas,

blood sample was collected in 10ml tube without anticoagulant and promptly centrifuged at 700 rpm for 3 minutes in centrifugal machine. The top layer was retrieved as I-PRF (Miron et al. 2017). The collagen membrane (Heali guide) was then cut to match the defect location and immersed in I-PRF liquid for 15 minutes (Fig. 1. b). Finally, the I-PRF clot enclosed collagen membrane, as a scaffold, was adapted (Fig. 1. c) and sutured coronally to the recipient site and Coe Pak placed (Fig. 1. d, 1. e).

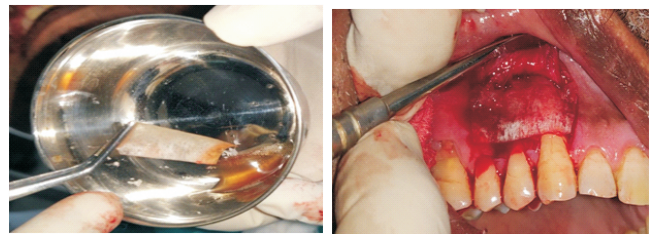
Results:

The sutures were removed after 15 days and healing was found to be satisfactory. 6 months postoperative review examination revealed complete coverage in relation to 13 and 14 (Fig. 1. f).

CAF WITH I-PRF & GTR MEMBRANE



Pre-operative Miller's class II recession defect in 13 and 14



Suture placed

Coe Pak Placed



Collagen membrane soaked in I-PRF

Placement of collagen membrane with I-PR



Before (left) and after (right) 6 months post surgery

Discussion:

Gingival recession correction has now become extremely important because to increased aesthetic demands and additional patient-centered problems such as hypersensitivity due to exposed roots, food lodgment, and plaque deposits. The surgical approach chosen should be very predictable and cause least patient morbidity. The flap thickness is a key variable in predicting the likelihood of total root coverage, and minimum 0.8 mm of thickness is advised.[7] As a result, the complete thickness elevation above recession defects produces a more predictable result in the CAF. Connective tissue grafting (CTG) is the gold standard procedure for recession coverage due to its better color match and inevitable result. It is, however, accompanied with problems such as higher patient discomfort and inadequate tissue accessibility. GTR appears to be a potential regeneration alternative for recession coverage with no statistically significant difference in result when compared to CTG.[8]The resorbable barrier collagen membrane contributes in space availability, integrity, compartmentalization and angiogenesis. PRF offers several benefits over CTG as a soft tissues grafting agent. A research comparing CTG with PRF found that PRF group had earlier wound vascularization.[9] However, the advantages of PRF remain debatable, and there is no data on the use of the I-PRF formulation in GR treatment. The I-PRF factors containing liquid concentrations of protein, hastens the endothelial cells integrity, encouraging the fast creation of a well organized capillaries as well as revascularization while avoiding the drawbacks of a fibrin matrix based PRF applications.[10] When I-PRF gel is used as a 3-dimensional scaffold for collagen membrane, it may promote fibroblast and epithelial cell mitosis and speed up the construction of connective tissue attachment and extended junctional epithelium.[11] As a result, the primary goal of this study was to assess the effects of adjunctive I-PRF application as a scaffold for collagen membrane in conjunction with CAF on the height and thickness of keratinized tissue as well as root coverage achieved for single Miller Class I&II recession defects. The present report demonstrates that CAF with I-PRF and collagen membrane, both of which have tissue healing characteristics, provides an extra advantage in addressing these confounding deficiencies. The limitation of study is inadequate plaque control and oral hygiene measures that might jeopardize the outcome before and after the surgical procedure.

Conclusion:

To the best of our knowledge, there are no other cases in the literature combining collagen membrane and I-PRF with CAF for Miller Class-I &II recessions.I-PRF used with collagen are the key factors for root coverage as they provide better wound healing as well as regeneration.

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