Case Report

Third Generation Platelet Concentrate in Esthetic Management: A Case Report

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ABSTRACT

Gingival recession is the most common problem affecting mostly the middle and older age patients to some degree. It may affect the healthy persons with good oral hygiene status as well as the persons with untreated periodontitis. Gingival recession can cause dental hypersensitivity, root caries, and unesthetic appearance. Various periodontal surgical procedures are available which includes coronally advanced flap (CAF), and this procedure having some advantages and disadvantages. To enhance the clinical outcome of such surgical procedures, different regenerative materials have been combined with it. In the present case report, we aimed for the root coverage in Miller's Class II gingival recession by means of CAF along with titanium platelet-rich fibrin membrane.

Keywords: Gingival recession, Root coverage, Coronally advanced flap, Titanium platelet-rich fibrin membrane

INTRODUCTION

Gingival recession is an apical migration of the gingival marginal tissue relative to the cementoenamel junction characterized by the root surface exposure. There are several factors that are responsible for the marginal tissue recession including faulty tooth brushing, occlusal trauma, gingival inflammation, tooth alignment, overhanging restorations, and high frenal attachment.[1] The treatment of the facial gingival recession is the most common requirement for esthetic concern and root hypersensitivity.

There are several treatment modalities for the root coverage such as pedicle flaps, free soft-tissue grafts, or the combinations of the above with/without barrier membranes.[2] The coronally advanced flap (CAF) is one of the most predictable approaches for the root coverage when there is sufficient amount of keratinized tissue present just apical to the gingival recession defect. This procedure is based on the coronal movement of the gingival tissues on the exposed root surface.[3] Despite having several advantages, CAF alone has shown unstable results caused due to the formation of the long junctional epithelium which will cause recession in the future.

To improve the results, various regenerative materials are used with the CAF which will enhance the root coverage. Titanium platelet-rich fibrin (T-PRF) is one such modality which is used to eliminate the potential carcinogenic effect of silica from the dry glass tube which was used to make leukocyte platelet-rich fibrin.[4] T-PRF is a 3rd generation autologous platelet concentrate in which there is a polymerized matrix which consists of platelet, cytokines, leukocytes, and various growth factors that are entrapped and act as a resorbable membrane. The growth factors with in the T-PRF upregulate the cellular activity and effective in the enhancement of early wound healing and are promoters of periodontal tissue regeneration. Because of various inherent factors present in autologous platelet concentrate which helps in the bone regeneration and also accelerate wound healing, so the gingival recession shown in this case report, was treated using autologous T-PRF membrane combined with CAF.

CASE REPORT

A 40-year-old male patient came to the department of periodontology and implantology with the chief complaint of hypersensitivity in upper front tooth region. Oral examination revealed Miller's Class II gingival recession in the left upper central and lateral incisor [Figure 1]. Due to the presence of sufficient attached gingiva apical to recession, CAF along with T-PRF was planned.

T-PRF preparation

The T-PRF preparation was done according to Tunali's protocol.[5] Briefly, 10 ml blood was collected by

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venipuncture in titanium tubes which were centrifuged at 2800 rpm for 12 min. With the help of sterile tweezer, fibrin clot was split from the RBC base [Figure 2] and then kept in a sterile dappen dish. Prior to use, PRF was slightly squeezed between the two gauze pieces to remove its serum content.

Surgical phase

The surgical area was anesthetized by giving 2% lignocaine. CAF was done according to de Sanctis and Zucchelli's CAF technique.[6] In this technique, two vertical incisions were made on mesial and distal side to the affected area and are joined by giving a sulcular incision [Figure 3] and a full-thickness flap is reflected beyond the mucogingival junction followed by the partial thickness flap at the mucogingival junction. After the reflection of the flap, the exposed root surface is debrided by the curettes. T-PRF membrane was placed over the root surface [Figure 4]. Flap was coronally positioned to cover the membrane and the recession defect and sling sutures were given using non-resorbable silk suture [Figure 5]. Periodontal dressing was applied to protect the surgical area. Post-surgical medication was prescribed along with the proper post-operative instruction Patient recalled after 6 month for reevaluation [Figure 6].

DISCUSSION

The present case report is aimed to treat Miller's Class II gingival recession with the autologous T-PRF membrane along with CAF. CAF gives the most predictable results due to its various advantages such as it does not require a separate surgical site to obtain a graft, high color matching with the adjacent area and does not require any extended surgical or healing time. With these advantages, CAF alone can be used to successfully treat the sites but sometimes recurrence occurs as healing in CAF occurs by the formation of long junctional epithelium. T-PRF is a new platelet concentrate, the method of preparation of which is based on the hypothesis that

Figure 2: Prepared titanium platelet-rich fibrin

Figure 3: Incision

Figure 1: Pre-operative view

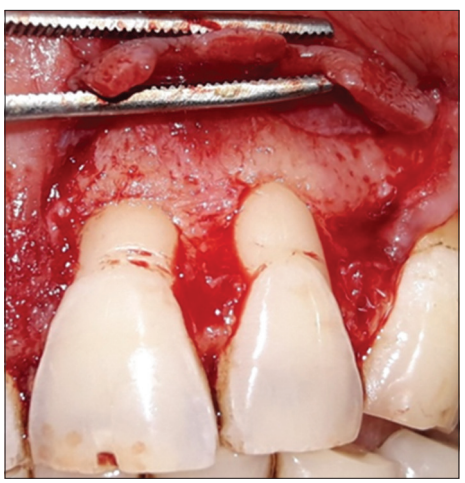

Figure 4: Titanium platelet-rich fibrin placed over the tooth surface

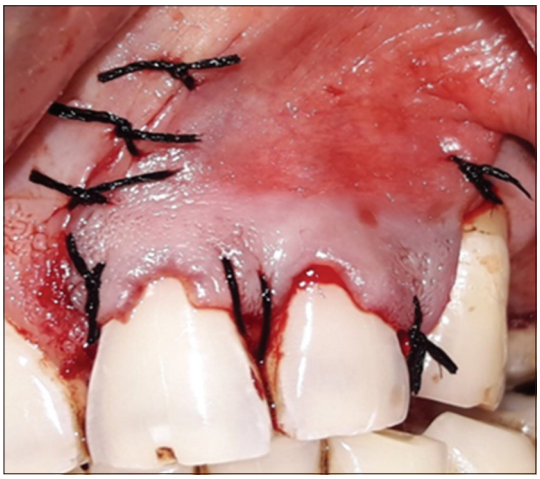

Figure 5: Suture placed

Figure 6: Six months post-operative view

titanium tubes may be more effective at activating platelets than the glass tubes. This material is used to avoid any adverse effects in the short or long term, or both, of dry glass or glass-coated plastic tubes and to eliminate any speculations about silica. In initial trials, it was found that titanium-induced platelet aggregation similar to that in glass tubes, and the clot produced in titanium tubes was clinically identical to that produced in glass tubes. However, the activation of platelets with titanium compared with activation with silica particles provides the distinctive characteristics of T-PRF, including its increased biocompatibility.[7] In the human study of T-PRF, it was confirmed that the basic histological structure of T-PRF is similar to L-PRF; however, the fibrin of T-PRF seemed more tightly woven and thicker than that of the classic L-PRF. This difference may be due to a better hemocompatibility of titanium compared to glass, which could have potentially led to the formation of a more polymerized fibrin.[8] Due to this structure, we can hypothesize that T-PRF may remain for a longer time in the tissue. T-PRF also promotes regeneration by the various growth factors which was liberated from platelets and leukocytes within the membrane. T-PRF also stimulates angiogenesis through fibroblast growth factor and vascular endothelial growth fact. It has the property of reduced necrosis and shrinkage of the flap and contains thrombin which polymerizes fibrinogen into fibrin that favors wound healing. There are various factors which will determine treatment outcome such as root prominence, tooth position, vestibular depth, high frenal pull, gingival thickness and faulty brushing technique. Thus, proper examination of the recession site is very important for successful treatment.

CONCLUSION

The use of autologous platelet concentrates, such as T-PRF membrane, helps in the regeneration of the lost tissue by the local delivery of growth factors enhancing wound healing primarily by angiogenesis. This case report reflects the success of T-PRF for coverage of recession defects. However, long-term clinical and histological findings are required to state the nature of the attachment formed and success of the treatment outcome.

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