

Autologous Growth Factors – A Paradigm in Treatment of Gingival Recession: A Case Report¹Dr. Vijila K., ²Dr. Jacob Raja S.A., ³Dr. Johnson Raja J., ⁴Dr. Tamil Selvan Kumar¹⁻⁴Rajas Dental College and Hospital, Kavalkinaru, Tamil Nadu 627105**Corresponding Author:** Dr. Vijila K., Rajas Dental College and Hospital, Kavalkinaru, Tamil Nadu 627105**Citation of this Article:** Dr. Vijila K., Dr. Jacob Raja S.A., Dr. Johnson Raja J., Dr. Tamil Selvan Kumar, “Autologous Growth Factors – A Paradigm in Treatment of Gingival Recession: A Case Report”, IJDSIR- February - 2021, Vol. – 4, Issue - 1, P. No. 102 – 106.**Copyright:** © 2021, Dr. Vijila K., et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.**Type of Publication:** Case Report**Conflicts of Interest:** Nil**Introduction**

Gingival recession is the exposure of root surface due to the displacement of soft tissue margin apical to the cement-enamel junction.¹ The primary goal of periodontal treatment is to achieve and maintain the natural dentition in good health, comfortable function and aesthetics. To be more specific, the ultimate goal of periodontal therapy or any other oral reconstructive procedure is to achieve complete wound healing and the regeneration of the tissues destroyed as a result of disease. Among the various root coverage procedures available for treating gingival recession, coronally advanced flap (CAF) is the most widely used procedure. Various regenerative material have been tried with CAF. Reconstructive dental surgeons are constantly looking for quick healing process to maximize predictability as well as the volume of regenerated bone.

Eventhough the ultimate goal of periodontal therapy is regeneration, most of the regenerative techniques commonly employed results in repair of tissues rather than regeneration. Various biological approaches have been

used for the promotion of periodontal tissue regeneration. GFs play an essential role in the repair and regeneration of jeopardized periodontal tissues. Growth factors (GFs) have long been believed to have the potential to accelerate the healing process and therefore, enhance tissue regeneration in challenging clinical scenarios. GFs are natural biological mediators that regulate the key cellular events in the process of tissue repair and regeneration.² They have a critical role in cell migration, cell proliferation and angiogenesis for tissue re-generation.³ The effect of each GF is regulated through a complex system of feedback loops, which involve other GFs, enzymes and binding proteins. Recent advances in the areas of cellular and molecular biology allowed better understanding of the functions of GFs and their participation in the different phases of wound healing. *In vitro* and *in vivo* studies have confirmed that GFs can enhance the capacity of tissues to regenerate by regulating cell chemoattraction, differentiation and proliferation.^{4,5} Platelets play a fundamental role in hemostasis and are a natural source of growth factors and various cytokines.

Growth factors within the platelet granules, includes Platelet Derived Growth Factor (PDGF), Insulin like Growth Factor (IGF), Vascular Endothelial Growth Factor (VEGF), Transforming Growth Factor Beta (TGF- β) and Platelet Derived Angiogenic Factor (PDAF). These growth factors play a very important role in wound healing and regeneration of tissues - both soft tissue and hard tissue regeneration.⁶ There are only few studies demonstrating the role of growth factors in treating gingival recession. Hence the aim of the present case report is to evaluate the effectiveness of platelet rich fibrin along with a modification of coronally advanced flap (Zucchelli's Technique) to treat gingival recession.

Case History

A 31 year old male patient reported to the department of periodontology in Rajas Dental College, Tirunelveli with the chief complaint of teeth sensitivity during intake of hot and cold drinks in maxillary left posterior region for past 1 year. No relevant medical history was noted. On clinical examination, Miller's class-I gingival recession, measured by calculating the distance between the cemento-enamel junction (CEJ) and the gingival margin was noticed in relation to 24,25,26 (Fig 1). Shallow Probing depth along with slight bleeding on probing, thick gingival biotype and adequate width of attached gingiva was observed. In order to correct the gingival recession defect Zucchelli's Technique procedure along with the placement of PRF was planned to carry out. Before commencement of the surgical procedure, the whole surgical procedure was explained to the patient and written informed consent was obtained. Complete blood investigations were carried out. Non surgical periodontal therapy such as scaling and root planning was done. Oral hygiene instructions were given. Three weeks after the phase I therapy, the periodontal examination was done and the surgical procedure was decided to carry out.

Surgical Procedure

Prior to surgical procedure, PRF was prepared using Choukron's protocol.⁷ A 10 ml of venous blood was drawn in test tubes without anticoagulant and centrifuged immediately at 3000 revolutions/min for 10 minutes. The final product obtained consists of three layers, the topmost layer consisted of platelet poor plasma, platelet rich fibrin at the middle, and red blood corpuscles (RBC) at the bottom. The fibrin clot was separated from the RBC base (preserving a small RBC layers) by using sterile surgical scissors or tweezers as shown in Fig 2.⁸ Then it was placed in a sterile petridish and was slightly squeezed with the gauze piece to remove its serum content. After giving profound local anaesthesia, an oblique vertical incisions were given from CEJ towards the gingival margin 3mm from the anatomic papilla and two vertical incisions using blade number 15 starting from its distal extremities i.e. from distal line angle of 23 and 26 and given extending beyond the mucogingival junction as shown in Fig 3. A split full split thickness flap was elevated till mucogingival junction (Fig 4). The flap ends were passively coronally advanced after the placement of PRF membrane (Fig 5) and secured with continuous sling suture. Periosteal sutures in apical extension of mesial and distal releasing incision were done using 4-0 vicryl sutures (Fig 6). Post-operative instructions were given and patient was recalled after 10 days for suture removal (Fig 7). Complete root coverage was noticed at the time of post operative examination with uneventful wound healing. Follow-up recorded 3 months post operatively shows 100% root coverage (Fig 8).

Discussion

The treatment of gingival recession plays an important role in the field of clinical periodontology. The surgical procedures with a very high percent of complete root coverage should be included in the mucogingival plastic

surgical techniques. The aim of the present study is to treat multiple Miller's Class-I gingival recessions with Modification of coronally advanced flap (Zucchelli's technique) and platelet rich fibrin. Choukroun's PRF, a second-generation platelet concentrate is defined as an autologous leukocyte and PRF biomaterial. PRF was developed in France by Choukroun *et al.* in 2001.⁹ The application of PRF is, it slows down the blood activation process which could induce an increased leukocyte degranulation and cytokine release from proinflammatory mediators.¹⁰ Growth factors trapped in PRF mesh are platelet-derived growth factors (PDGFs), transforming growth factor beta (TGF- β), vascular endothelial growth factor (VEGF), and epidermal growth factor (EGF), insulin like growth factor-1 (IGF-1). Platelet growth factors exhibit chemotactic and mitogenic properties. As a healing material, PRF stimulates the gingival connective tissue on its entire surface with growth factors and impregnates the root surface with key matrix proteins for cell migration. It maintains the flap in a high and stable position, enhances neoangiogenesis, reduces necrosis, shrinkage of the flap and promotes maximal root coverage.¹¹

The advantages of CAF includes its ability to treat multiple areas of gingival recession with no necessary for the involvement of adjacent teeth, high degree of success rate and even if the procedure does not work, it does not increase the existing problem.[12] The only disadvantage of this technique is that CRC is not obtained in all the sites and the gingival recession tends to relapse in a few sites after some years. The modification of coronally advanced flap technique used in this study for multiple gingival recession defects was described by De Sanctis and Zucchelli in 2007.¹³

The result from the present case report are in accordance with the studies conducted by Sonam et al and Elif et

al.^{14,15} These studies have confirmed the successful use of PRF membranes in the management of both single and multiple gingival recession defects. Thus, in the present study, addition of PRF to modification of CAF (Zucchelli's technique) is done. The outcome of the present case is successful. However, for assessing the type of healing no histologic evaluation was done. Therefore, the effect of PRF on the establishment of a connective tissue attachment remains to be determined. Further evaluation of PRF to CAF is necessary to find out the type of healing histologically. Long term follow up of the clinical case is needed. Other limitations may be a split-mouth design would have been done so as to know the patient's individual objective reactions and healing. Secondly, the percentage of root coverage was also not established in the study which could have been a contributing factor if taken into consideration. This study is not compared with other guided regenerative techniques such as collagen membrane, connective tissue graft and amniotic membrane etc.

Conclusion

Periodontal regeneration and rapid healing effects have made the use of PRF in various surgical procedures in periodontics. In the present case report use of PRF along with Zuchelli's technique provided complete root coverage.

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Legend Figures



Fig 1: Pre-operative View

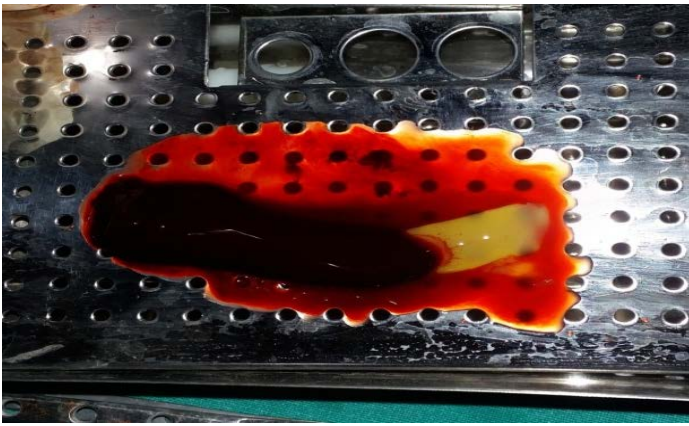


Fig 2: PRF



Fig 3: Placement of Oblique and Vertical Releasing Incision



Fig 4: Split-Full-Split Thickness Flap Reflected



Fig 5: PRF Placed



Fig 6: VICRYL MATERIAL SUTURING DONE



Fig 7: 2-Week Postoperative



Fig 8: 3 Month Postoperative View