Case Report

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Platelet Rich Fibrin-Novel Source for Root Coverage: A Case Report

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ABSTRACT

Background: Apical migration of gingival margin, gingival recession, is mainly due to improper oral hygiene measures and periodontal diseases. Treatment of gingival recession has become an important cosmetic and therapeutic issue. The aim of periodontal regenerative surgeries is to achieve complete wound healing and regeneration of the periodontal unit. A recent innovation in dentistry is the preparation and use of platelet rich fibrin, a concentrated suspension of the growth factors, found in platelets. These growth factors involved in wound healing are postulated as promoters of tissue regeneration.

Keywords: Gingival recession, Periodontal regeneration, Growth factors, Wound healing.

INTRODUCTION

Exposure of the tooth by apical migration of the gingiva is called gingival recession/ atrophy. Gingival recession is defined as the displacement of the gingival margin apical to the cementoenamel junction. The primary causes of recession are periodontal disease and improper oral hygiene measures.[1] The term marginal tissue recession is used rather than gingival recession since marginal tissue recession covers both gingival recession and alveolar mucosal recession.[2] The first attempt to classify gingival recession according to its amenability of being covered using mucogingival surgical procedures was published by Sullivan and Atkins.[3] The basis for their gingival recession classification was the depth and width of the defect. The four were deep wide, shallow wide, deep narrow and shallow narrow. Later, Miller proposed a classification based on according to the height of the interproximal papillae adjacent to the defect area.

CASE REPORT

A 24 year old female patient who complained of sensitivity and receding gums in lower front teeth region. On local examination of the site, the gingiva in relation to 41 was erythematous and soft. Millers grade I mobility was observed with class IV gingival recession (Fig 1). On radiographic examination alveolar bone loss was observed in 31and 41 region with improper root canal treated teeth (Fig 2). Patient was not willing for extraction of the involved teeth

Surgical procedure

Thorough scaling and root planing and re-endodontic therapy due to earlier improper obturation was done and followed by coronoplasty and splinting.

After anesthetizing the area, the recipient bed was prepared by horizontal incisions which were given at the level of the cementoenamel junction in the two interdental papillae adjacent to

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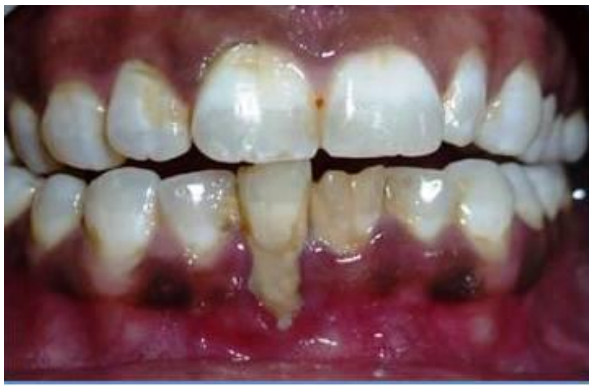

Fig 1: Intra Oral Preoperative Photograph.

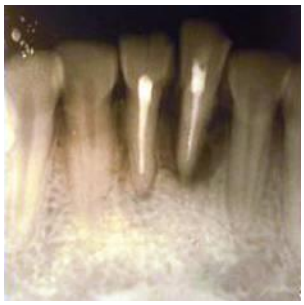

Fig 2: IOPA

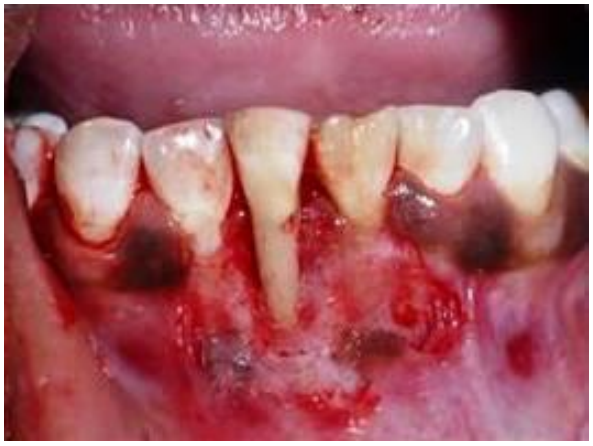

Fig 3: Intraoperative Photograph.

the recession area to be covered. Two flared vertical incisions are then placed at the distal ends of the horizontal incisions and are extended beyond the mucogingival line. Using sharp lateral dissection, a split thickness flap is elevated to the level of the apical end of the vertical incisions. Using a metal foil template on the donor site free gingival graft was obtained (Fig 3).

Platelet rich fibrin (PRF) autologous graft was prepared by collection of patient's blood sample without adding anticoagulant in 10 ml tubes which is immediately subjected to centrifugation at 3000 rpm for 10 minutes. After centrifugation, the test tube contained 3 layers of which, upper most layer is platelet poor plasma and middle layer is platelet rich fibrin and the lower one is the red blood cell corpuscles. The PRF gel which was obtained from patient's blood through centrifugation is separated from RBC layer to get autologous PRF graft.

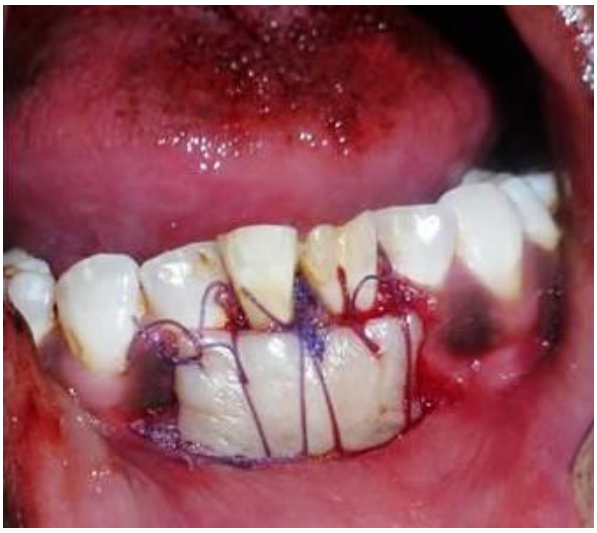

Fig 4: PRF graft with sutures.

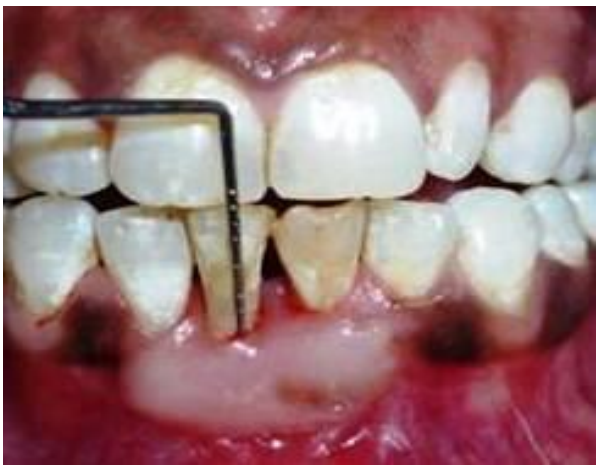

Fig 5: Post operative follow up.

The PRF graft which was obtained from patients blood through centrifugation, was placed on the recipient site and then the free gingival graft was placed and secured with sutures (Fig 4). Postoperative follow up was done after 10 days, 3 months, 6 months and 9 months. Postoperative follow up revealed improved root coverage.

DISCUSSION

Treatment of gingival recession has become an important therapeutic issue due to increasing aesthetic demand. A recent innovation in dentistry is the preparation and use of PRF, a concentrated suspension of the Growth Factors (CGF), found in platelets of the patient blood. 4 PRF was first developed in France by Choukroun for specific use in oral and maxillofacial surgery. This technique requires neither anticoagulant nor bovine thrombin (nor any other gelling agent). It is nothing more than centrifuged blood without any addition of anticoagulants.[5]Two most important growth factors that are present in PRF are Platelet-derived growth factor (PDGF), and transforming growth factor-β (TGF-β).[5, 6]

PGDF is a chemotactic factor for polymorphonucleocytes, macrophages, fibroblasts and smooth muscle cells and it also stimulates cell replication of important stem cells for fibroblasts and endothelial cells PDGF also stimulate the production of fibronectin, a cell adhesion molecule used in cellular proliferation and migration during healing, including osteoconduction. TGF-β stimulates fibroblast chemotaxis and the production of collagen and fibronectin by cells, while inhibiting collagen degradation by decreasing proteases and increasing protease inhibitors, all of which favour for fibrogenesis.[6]

Angiogenesis consists of the formation of new blood vessels inside the wound. Angiogenesis soluble factors such as fibroblast growth factor basic (FGFb), vascular endothelial growth factor (VEGF), and platelet-derived growth factor (PDGF) are included in fibrin gel.[7] Fibrin, fibronectin, PDGF, and transforming growth factors (TGF-b) are essential to modulate integrin expression, fibroblast proliferation, and their migration inside the wound.[8]

PRF has to be considered as a fibrin biomaterial. Its molecular structure with low thrombin concentration is an optimal matrix for migration of endothelial cells and fibroblasts. It permits a rapid angiogenesis and an easier remodeling of fibrin in a more resistant connective tissue.[9]

Incorporating the PRF along with free tissue grafting procedures using regenerative membranes to obtain root coverage has been demonstrated to enhance the healing and soft tissue regeneration process in root coverage procedures.[10] We could achieve improved root coverage by using this procedure and recomend to use PRF in many such cases to exactly know the outcome of using PRF.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Loe H, Anerud A and Boysen H. The natural history of periodontal disease in man: prevalanc, sevearity, extent of gingival recession. J periodontol 1992;63:489-495.

2. Maynard JG, Wilson RD. Physiologic dimensions of the Periodontium significant to the restorative dentist. J Periodontol 1979; 50: 170–174

3. Sullivan HC, Atkins JH. Free autogenous gingival grafts and utilization of grafts in the treatment of gingival recession. Periodontics 1968:6: 152–160.

4. New technique: The use of PRF membrane for dental root coverage by Michel Jazzar Last Updated (Sep 20, 2010 at 09:59 PM).

5. Choukroun J, Adda F, Schoeffler C, Vervelle A. Unique opportunity in periodontologyImplantodonite.2000;42:55-62.

6. Townsend CM. The biological basis of modern surgical practice. 16th ed. Philadelphia: Saunders; 2001:1375.

7. Dvorak HF, Harvey VS, Estrella P, Brown LF, McDonagh J, Dvorak AM. Fibrin containing gels induce angiogenesis. Implications for tumor stroma generation and wound healing. Lab Invest 1987; 57:673-86.

8. Gray AJ, Bishop JE, Reeves JT, Laurent GJ. Alpha and Beta chains of fibrinogen stimulate proliferation of human fibroblasts. J Cell Sci 1993; 104(2):409-413.

9. Anitua E, Sanchez M, Nurden AT, Nurden P Orive G and Andia I New Insight into novel application for platelet fibrin therapies. Trends in biotechnology 2006; 24; 5; 227-234.

10. Dohan MS, Joseph C, Antoine D, Dohan SL, Dohan AJ and Mouhyi J et al. Platelet-rich fibrin (PRF): A second-generation platelet concentrate.Part I: Technological concepts and evolution. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006;101:E37-44.