

**CASE REPORT****PLATELET RICH FIBRIN (PRF) AND  $\beta$ -TRICALCIUM PHOSPHATE WITH CORONALLY ADVANCED FLAP FOR THE MANAGEMENT OF GRADE-II FURCATION DEFECT****Jain Sambhav<sup>1</sup>, Rai Rohit<sup>1</sup>, Mohan Ranjana<sup>1</sup>, Mehrotra Shalabh<sup>1</sup>****ABSTRACT**

**BACKGROUND:** *Multirrooted teeth offer unique and challenging problems due to the furcation area, creates situations in which routine periodontal procedures are somewhat limited and special procedures are generally required.*

**CASE DETAIL:** *The present case was showing the management of grade II furcation defect by platelet rich fibrin (PRF) and  $\beta$ -Tricalcium phosphate with coronally advanced flap.*

**CONCLUSION:** *Platelet rich fibrin and  $\beta$ -Tricalcium phosphate with coronally advanced flap have been shown to be a promising and successful approach for the treatment of furcation defect. Its gaining clinical attachment significantly manages both the gingival recession and furcation involvement simultaneously.*

**KEY WORDS:**  *$\beta$ -Tricalcium Phosphate, Coronally Advanced Flap, Furcation Involvement, Platelet Rich Fibrin.*

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**INTRODUCTION**

Periodontal tissue is destroyed in the course of Periodontitis by disproportionate immunologic responses to a triggering agent, such as bacteria in biofilm (1). It has been reported that molars with furcation involvement caused by periodontitis, have a higher rate of periodontal breakdown and respond less favorably to periodontal therapy than molars without furcation involvement or single-rooted teeth (2-4).

Multirrooted teeth offer unique and challenging problems for the periodontist. The furcation area, because of the interrelationships between the size and shape of the teeth, the roots and their alveolar housing, and the varied nature and pattern of periodontal destruction create situations in which routine periodontal procedures are somewhat limited and special procedures are generally required. It has been shown that the best chance for success lies in early recognition and treatment of furcation involvement (5). Grade II furcation is any

involvement of the interradicular bone without a through-and-through ability to probe (6). Various materials have been used to resolve furcation defect including autografts (7-11), demineralised freeze-dried bone allografts (DFDBAs) (12-13), bovine-derived xenografts, barrier membranes and combinations of membranes and bone grafts. Although these regenerative materials are being used today, the introduction of biomimetic agents such as enamel matrix derivatives (13), platelet rich plasma (PRP) (14), platelet-derived growth factor and bone morphogenetic proteins (13) have shown better outcomes in furcation treatment.

Platelet-rich fibrin (PRF) developed in France by Choukroun et al (14) is a second generation platelet concentrate. Its advantages over the better known platelet-rich plasma (PRP) include ease of preparation/application, minimal expense and lack of biochemical modification (no bovine thrombin or anticoagulant is required).

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PRF is a strictly autologous fibrin matrix containing a large quantity of platelet and leukocyte cytokines (13-18).

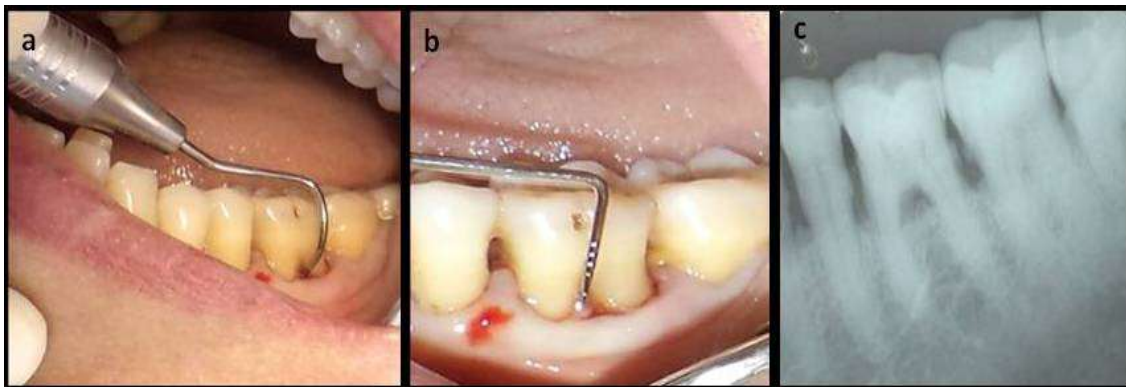
Resorbable tissue replacement (R.T.R) is a biocompatible synthetic alloplast material of the highest purity. RTR granules have a  $\beta$ -Tricalcium phosphate crystalline ( $\beta$  TCP) structure. It is extremely hydrophilic, so it is drawn into the surgical site and can be easily contoured to fill any bony void. This makes RTR ideal for the treatment of periodontal defects, ridge augmentations, and extraction socket therapy (post-extraction ridge preservation).

The coronally advanced flap is a simple pedicle flap that can be utilized for root coverage, and does not require graft harvesting. A potential limitation of the coronally advanced flap is the limited gain in the apico-coronal dimension of the keratinized tissue which is an important parameter in preventing the recurrence

of gingival recession (19). This case report shows the effectiveness of PRF along with bone graft to manage grade-II furcation defect.

## CASE REPORT

A 45 year old female reported to the Department Of Periodontology, Teerthankar Mahaveer Dental College and Research Centre with a chief complaint of severe sensitivity, bleeding and food lodgment in the lower left back region since last 3 months. On clinical and radiographic examination, advanced grade-II buccal furcation involvement and recession with 36 were diagnosed. There was no attachment loss on lingual surface of 36 (Figure 1). Ethical clearance was obtained from the ethical board of the Teerthankar Mahaveer University. Informed consent was also secured from the patient for the procedure and use of her record for publication.



**Figure 1:** (a) 9 mm loss of horizontal clinical attachment when measure with Naber's probe, (b) 7mm loss of Buccally vertical attachment when measured with William's probe, (c) Radiographic image

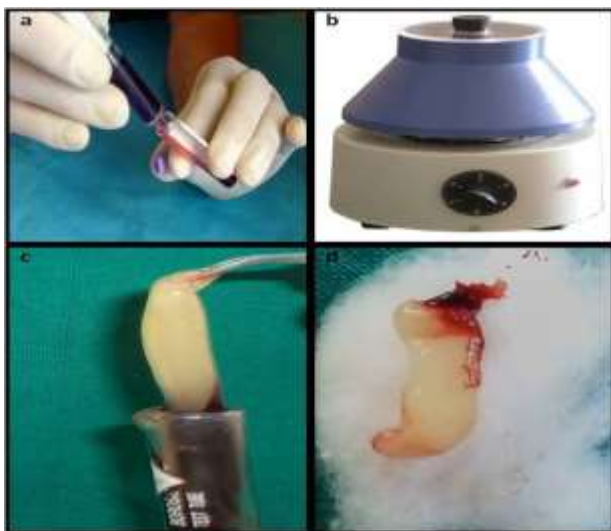
## Pre-Surgical Therapy

That patient underwent Scaling and Root Planning by ultrasonic dental unit (Densply Cavitron Bobcat Pro) and Gracey curettes (Hu-Friedy) under local anaesthesia. The patient received special training on brushing her teeth twice daily using the modified Bass technique and flossing. Patient's oral hygiene was acceptable before the surgery.

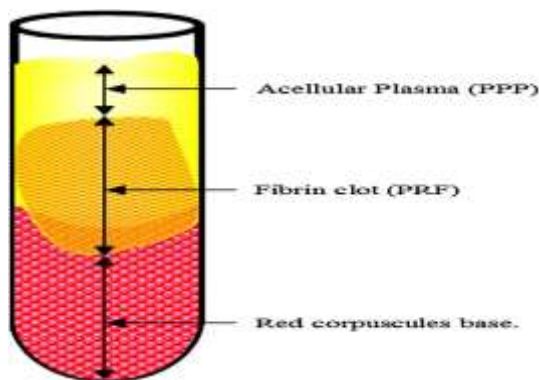
For the preparation of platelet rich fibrin centrifugation machine, 5ml syringe and 9ml blood collection tubes were used. Five milliliter

blood was collected from the same patient. Then, the blood was drawn into the tube without anticoagulant. The blood was transferred to centrifugation machine within 1-2 minutes after collection and it centrifuged for 15 minutes at 3000rpm. Absence of anticoagulant allows activating the majority of the platelets contained in the sample which triggers a coagulation cascade. Fibrinogen initially concentrates in the upper part of the tube; until the effect of the circulating thrombin transforms it into a fibrin network (Figure 2 & 3). The PRF was collected

from centrifuge tube with tweezers and placed on a sterile gauze piece.



**Figure 2:** (a) Blood drawn into the tube without anticoagulant, (b) Blood centrifuged for 15 min at 3000rpm, (c) Pliers inserted into the tube to gently grab the fibrin clot with attached RBC's, (d) platelet rich fibrin



**Figure 3:** Different layer in centrifuged blood

### Surgical Procedure

The surgical site was isolated and anaesthetized with 2% xylocaine hydrochloride with adrenaline (1:200000). Two vertical incisions were made, one on the mesial line angle of the second molar and the other on the distal line angle of the second pre-molar beyond the mucogingival junction.

Crevicular incision was made from the mesial vertical incision to the distal vertical incision. The full thickness flap was then raised beyond the mucogingival junction. The furcation area was debrided thoroughly, and granulation

tissue was removed through scaling and root planning. After scaling and root planning R.T.R granules were placed in the furcation defect area. After the RTR granules were placed, PRF membrane was placed to cover the site and the osseous graft (Figure 4). The patient was evaluated at 1,3, 6 and 9 months with a positive result when grade-II furcation defect was treated with PRF and beta-Tricalcium phosphate.



**Figure 4:** (a) Full thickness flap raised, (b) R.T.R granules placed in the furcation defect area, (c) PRF membrane placed to cover the site and the osseous graft, (d) 1 month post-operative

### DISCUSSION

Platelet-rich fibrin (PRF), developed in France by Choukroun et al (14), is a second generation platelet concentrate widely used to accelerate soft and hard tissue healing. Although PRF has been used for several procedures such as ridge augmentation, the furcation defect is mostly managed by bone graft and *Guided Tissue Regeneration Membrane*. But, very few studies have been conducted to evaluate the effect of PRF in treatment of furcation defects. Although PRF has been used for several procedures such as ridge augmentation, very few studies have been conducted to evaluate the effect of PRF in treatment of furcation defects.

Platelet rich fibrin and  $\beta$ -Tricalcium phosphate with coronally advanced flap has been shown to be a promising and successful approach for the treatment of furcation defect. Its gaining clinical attachment significantly manages

both the gingival recession and furcation involvement simultaneously.

This case report suggests that the combined treatment approach i.e. with PRF and beta-tricalcium phosphate was effective in treating the furcation defect. The placement of beta-tricalcium phosphate along with platelet rich fibrin gel is still a young field in which many discoveries are yet to be made. The primary goal of the study was to manage grade-II furcation defect with the help of platelet rich fibrin and beta tricalcium phosphate which showed promising results.

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