

Platelet rich fibrin: a panacea for lost interdental papilla

Shivanand Aspalli¹, Nagappa G², Aditi S. Jain³

ABSTRACT

¹Prof. & Head of the Department,
²Reader, ³Post graduate Student,
Department of Periodontics & Oral
Implantology, A.M.E's Dental College
& Hospital, Bijangera road, Raichur -
584103

Address for Correspondence

Dr. Aditi S. Jain
Post graduate Student
Department of Periodontics & Oral
Implantology, A.M.E's Dental College
& Hospital, Bijangera road,
Raichur - 584103
Email: draditisj@gmail.com

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Introduction: Loss of interdental papilla marks phonetics, functional and esthetic problem. Surgical techniques are diverse, but none have given predictable results.

Aim: The purpose of this case report is to present reconstruction of papilla by using platelet rich fibrin membrane in maxillary anterior region.

Methodology: 30yr old male patient reported with an unesthetic smile due to loss of interdental papilla in the maxillary left central and lateral incisor region since 6 months. The treatment was planned for reconstruction of lost interdental papilla using PRF. A pouch was created with a semilunar incision, PRF was prepared and inserted into the pouch and the entire gingivopapillary unit was displaced coronally.

Conclusion: Optimal fill was noted at 1, 3 and 6 months postoperatively with excellent esthetic outcome. Use of PRF and proper technique may thus be the panacea for interdental papilla augmentation.

Keywords: PRF, Interdental papilla, Esthetics, Maxillary anterior, Black triangle

INTRODUCTION

From the time known, dentistry has just been a restricted field but now dentistry has expanded its horizons. Today as we head towards modernization and urbanization esthetic demands in dentistry have increased rapidly, driven by an enhanced awareness of beauty and esthetics. The ultimate goal in modern dentistry is to achieve “white” and “pink” esthetics. “White esthetics” are the natural dentition or the restoration of dental hard tissues with suitable materials. “Pink esthetics” refers to the surrounding hard and soft tissues, which can enhance or diminish the esthetic result.

Today, in majority of the adult population with a history of periodontal disease, open gingival embrasures are a common problem resulting in “black triangles”. A black triangle or an open gingival embrasure occurs as a result of a deficiency or loss of papilla beneath the contact point. Periodontists have attempted to reconstruct this lost papilla by numerous surgical methods like free gingival grafting, coronally positioning of the papilla from the palatal side, subepithelial connective tissue graft with apically positioning of the papilla.

A recent innovation in dentistry is the preparation and use of platelet-rich fibrin (PRF), a concentrated suspension of the growth factors found in platelets derived from centrifuged blood. Platelet rich fibrin (PRF) is a type of platelet gel; a matrix of autologous fibrin, which has scored over platelet rich plasma by virtue of its properties, easier preparation, and cost effectiveness. It promotes wound healing, wound sealing and hemostasis.¹ The purpose of this case report is to present the use of platelet rich fibrin (PRF) in the reconstruction of papilla in the maxillary anterior region of a 30 years old man.

CASE REPORT

A 30 year old male patient reported to the Department of Periodontics, A.M.E's dental college & hospital with a chief complaint of gap and black appearance in upper front teeth. On Clinical examination it was observed that class 1 papillary loss (Fig. 1). The distance between the contact point to the bone crest was 6 mm. No facial recession was evident on 11, 12, and 21. The distance between the contact point of adjacent teeth and the existing papilla was 4 mm. The surgical procedure was explained and informed consent was obtained.

Preparation of PRF: Before the start of the surgery the preparation of PRF was carried out as per the protocol developed by Choukron *et al.* in milliliter of intravenous blood (antecubital site) was collected in sterile 10 ml tubes without the addition of an anticoagulant and centrifuged at 3000 revolutions ($\approx 400 \times g$) per minute for 10 minutes. PRF settles down between the platelet poor plasma (PPP) at the top and the red blood cells (RBC) at the bottom of the

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tube. Platelet rich fibrin at the center with platelet poor plasma at the top and red blood cells at the bottom of the test tube.²

SURGICAL PROCEDURE

Intraoral antiseptis was performed by rinsing with 0.2% chlorhexidine digluconate for 30 seconds. Adequate local anesthesia was achieved with 2% lignocaine hydrochloride (HCL). A split thickness semilunar incision was given about 1 mm coronal to the mucogingival junction in the interdental region of 21,22(Fig. 2).³ Through the semilunar incision towards the interdental papillae, the split thickness flap was continued to create a pouch in the interdental area (Fig. 2). The prepared PRF was removed using sterile tweezers and trimmed with scissors and transferred on to sterile gauze (Fig. 3). A thick fibrin membrane was obtained by squeezing the serum out of the PRF clot. A curette was used around the necks of 21 and 22 to free the tissue attachment from the root surface, facilitating the displacement of gingivopa-pillary unit coronally.⁴ This membrane was eased in to the pouch and pushed coronally, enabling to fill the bulk of the interdental papillae (Fig. 4). The incisions were secured with 4-0 non-resorbable sutures (Fig. 5). The surgical area was protected with a light cured periodontal dressing. Analgesics were prescribed along with chlorhexidine digluconate (0.2%) rinse twice daily for 10 days. Patient was abstained from brushing at the surgical area and was asked to clean the tooth surface with the cotton pellet dipped in the 0.2% chlorhexidine mouthwash for 10 days. Postoperative healing was uneventful with minimal pain. Review of the patient on 10th day revealed partial fill of the interdental region. The patient was then evaluated for 1 month, 3 months & 6 months (Fig. 6).



Fig. 2: Semilunar incision taken 1 mm coronal to mucogingival junction & pouch created through the semilunar incision



Fig. 3: Prepared PRF



Fig. 1: pre-operative picture of lost interdental papilla irt 21 and 22



Fig. 4: coronally displaced pouch with PRF



Fig. 5: sutures placed



Fig. 6: post-operative view after 6 months

DISCUSSION

The loss of gingival embrasures occurs due to several factors including periodontal disease, length of embrasure area, root angulations, interproximal contact position, changes in papilla during orthodontic alignment and triangular-shaped crowns. Also deficiency of the papillae might be a consequence of post periodontal surgery.

An assortment of surgical procedures has been tried out in papilla reconstruction. Shapiro et al. advocated use of repeated curettage to stimulate the regrowth of interdental papillae in necrotizing ulcerative gingivitis.⁵ The roll technique and the use of pedicle graft with coronal displacement of the gingivopapillary unit and subepithelial connective tissue grafting has been presented.^{6,7} Interpositional subepithelial connective tissue grafting and use of buccal and palatal split thickness have been tried out.⁸ Interdental papilla augmentation along with reconstruction of interdental bone to create appropriate support for gingival papilla has been reported.⁹

This technique using PRF flap offers a reliable solution as PRF membrane has both mechanical adhesive properties and biologic functions like fibrin glue; it maintains the flap in stable position, enhances neoangiogenesis, reduces the necrosis and shrinkage of the flap and stabilization of the gingival flap in the highest covering position.¹⁰ The PRF is easy to procure, not expensive and can be prepared in few minutes. PRF provides ideal healing properties. This fibrin matrix inclusive of its platelets, leucocytes, and cytokines allow remodeling of interdental papilla to occur. It has been found PRF organized as a dense fibrin scaffold with a specific release of growth factors (TGF-1 β , PDGF-AB, and vascular endothelial growth factor (VEGF) and glycoproteins (thrombospondin -1) during ≥ 7 days, is critical for the “take” of the grafted PRF membrane.¹¹

Platelet cytokines, platelet derived growth factors (PDGF)- α and (PDGF)- β , transforming growth factor beta (TGF)- β and insulin-like growth factor-1 (IGF-1) are gradually released, aiding the process of healing. Advantages of using PRF is that the need for donor site is eliminated, making the technique less invasive, lessens postsurgical discomfort, promotes rapid soft tissue healing with less edema compared to connective tissue graft and enamel matrix derivative technique. Thus, it is easy to prepare and lacks biochemical handling of blood, which makes this preparation strictly autologous.

CONCLUSION

The reconstructed papilla was examined at 1, 3 & 6 months post-operatively (Fig.8,9,10). Clinically it shows the coverage of the defect (Fig. 11,12). By this it can be concluded that this technique improves the esthetics of the patient and it is one of the simple and easy procedure for the reconstruction of the lost papilla. However, studies with a longer duration are required to determine the success rate and predictability of this procedure.

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