CASE REPORT

Papilla augmentation using platelet rich fibrin - A case report

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ABSTRACT: Interdental papilla plays a vital role in determining aesthetics. Loss of interdental papilla is seen as unaesthetic black triangles in the interdental space. To regenerate the lost papilla, various techniques have been tried. In most of the techniques, connective tissue grafts are used to fill the space. This case report presents augmentation of interdental papilla using Han & Takei method with use of platelet rich fibrin. The advantage of using PRF is that there is no secondary surgical site involvement and patient acceptability & comfort is much greater.

Key Words: Papilla augmentation, platelet rich fibrin, periodontal plastic surgery, micro surgical technique.

INTRODUCTION

A successful aesthetic dentistry involves not only the restoration of lost teeth and their hard tissues, but increasing the management and reconstruction of encasing gingiva.⁽¹⁾ Aesthetics of soft tissue depend on morphology and color of the soft tissues. When morphology is concerned, Interdental papilla plays a vital role in determining the aesthetics.⁽²⁾ Absence of papilla presents as black triangles in the interdental region and is associated with both aesthetic and functional problems. Loss of papilla is often a consequence of periodontal disease, which due to inflammation causes interproximal bone resorption.⁽³⁾

Various surgical techniques have been practiced for augmentation of the lost interdental papilla. Most of these techniques employ the use of connective tissue graft to fill the papilla space. Though this has the advantages of good color match and better predictability, the major disadvantage is that the procurement of connective tissue graft is technique sensitive and it involves second surgical site.⁽⁴⁾

This case report provides an alternative of using Platelet Rich Fibrin (PRF), a second generation platelet concentrate for papilla augmentation in maxillary anterior region.

CASE REPORT

A 45 year systemically healthy non smoking male patient reported to the department of Periodontology, Indira Gandhi institute of dental sciences with the chief complaint of unaesthetic appearance of his gums in the upper front teeth region. Clinical examination revealed esthetically compromising black triangles between 11 and 12 (Fig 1). The gingiva was clinically healthy, with no obvious signs of inflammation. As a routine procedure, scaling was done and OHI was given.

Fig - 1

According to Nordland and Tarnow classification if the distance from the contact point to the tip of the papilla was ≤ 5 mm, papilla space will be filled completely. So radiographs were taken and the distance from crest of bone and contact point was measured and it was 4 mm (Fig 2).

Fig - 2

Since the case was ideal, papilla reconstruction with Han & Takei surgical technique with the use of PRF was planned. The surgery was done with microsurgical instruments: microscalpel (crescent /tunnel blade 2mm: manufacturers Appadent) and compound loupes with magnification of 3.5x.

PLATELET RICH FIBRIN PREPARATION

Before the start of procedure, blood collection for PRF was done. The preparation of PRF was carried out as per the protocol developed Choukron et al wherein 10 ml of intravenous blood was collected from antecubital vein under aseptic conditions and dispensed into a sterile 10 ml tubes without any anti coagulant and centrifuged at 3000 revolutions per minute (RPM) for 10 minutes. The resultant supernatant will have three layers. (Fig-3)

Fig - 3

PRF settles down between the platelet poor plasma (PPP) at the top and the red blood cells at the bottom of the tube.⁽⁵⁾ This clot is removed from the tube and the attached red blood cells scraped off and discarded. The PRF clot is squeezed in wet gauze. This produces an inexpensive autologous fibrin membrane. (Fig 4)

Fig - 4

SURGICAL PROCEDURE:

The site was anaesthetized using 2% Lignocaine hydrochloride. The recipient site was prepared using Han & Takei technique.⁽⁶⁾ A split thickness semilunar incision was given about 1mm coronal to the mucogingival junction in the interdental region of 11 & 12. (Fig:5) A 3-5mm semilunar incision was given with no.11 blade 2mm coronal to mucogingival junction. Through the semilunar incision towards

the interdental papilla, the split thickness flap was continued to create a pouch in the interdental area, following which intra crevicular incision over the teeth neighbouring the defect extending from buccal aspect to palatal aspect keeping the existing papilla preserved. Through the semilunar incision the gingivopapillary unit was freed from underlying bone using a orban knife extending to palate. Thus a buccal void (dead space) could be established between the soft tissue and bone structure. (Fig - 6)

Fig - 5 & 6

To maintain the whole gingivopapillary unit coronally the dead space was filled with PRF. (Fig- 7) The prepared PRF was removed using sterile tweezers and transferred to sterile gauze. A thick fibrin membrane was obtained by squeezing the serum out of the PRF clot. This membrane was placed into the pouch and pushed coronally enabling to fill the bulk of interdental papilla. Absorbable sutures 5-0 vicryl was used to secure the incised margins. (Fig-8) Finally to protect the surgical site, periodontal dressing was given.

Fig - 7 & 8

POST OPERATIVE INSTRUCTIONS

Patient was advised to take Analgesics (Paracetamol 500 mg S-O-S) Amoxycillin 500 mg tid for 3 days along with Chlorhexidine digluconate (0.12%) rinse twice daily for 10 days and not to brush aggressively in the operated area.

Post surgical follow up

All the patients were recalled after 24 h to assess

any postoperative complication such as bleeding, pain, swelling and hematoma etc. After an interval of 10 d, patients were recalled for the removal of the periodontal dressing, sutures from the donor site and appraisal of the healing response. The area was irrigated and patients were kept on a postsurgical follow up for 1 week. Clinical parameters were evaluated during follow up visits at 1 month, 3

Fig - 9 & 10

months and at 6 months interval .(Fig -9) (Fig- 10) Postoperative healing was uneventful with minimal pain. Patient was reviewed post operatively first week, second week and third week for wound healing index. ⁽⁷⁾

RESULTS: The patient was followed up for 3months and 6 months post-operatively and the distance from the contact point to the tip of the papilla was measured. It reduced to 0 mm from 4 mm at the baseline indicating complete papillary fill. (Table 1). Wound healing index was also measured

Table 1: Comparision of the tissue fill in the interdental papilla

Distance from tip of papilla to the contact point	Pre – operative	3 months post operative	6 months post operative
	4mm	1mm	0 mm (complete fill)

Table 2: Comparison of wound healing index

Time interval	1 week post-op	2 week post-op	3 week post-op
Wound healing index	3	4	5

at 1 week, 2 week and 3 week post operatively and the scores were 3 on 1 week post-operatively and changed to score 5 on 3 week post-operatively.(Table 2).

DISCUSSION

The interdental space is the physical space present between two adjacent teeth, and its shape and volume are determined by the morphology of the teeth. This space is filled by the interdental papilla. The interdental papilla is the gingival tissue that fills this space and is formed by dense connective tissue covered by oral epithelium. The factors which influence the presence or absence of papilla are crestal alveolar bone height, dimension of interproximal space, soft tissue appearance (thick or thin biotype) minimal buccal plate thickness, type of contact area(triangular versus square) and the biologic width.⁽²⁾ Absence of interdental papilla clinically presents as black triangle. The most common reason for black triangle in the adult population is plaque associated loss of periodontal support as well abnormal tooth shape or traumatic oral hygiene.⁽⁸⁾

The classical study conducted by Tarnow *et al.* correlated the presence or absence of interdentalpapilla with the distance between the bone crest and the contact point. The presence of the papilla was observed in almost 100% of the cases in which the distance was less than or equal to 5 mm, in 56% of cases in which the distance was 6 mm, and only 27% of cases in which the distance was 7 mm or more. Since in this case the distance was 4 mm, it was considered ideal for papilla augmentation. Various surgical procedures have been proposed for papillary augmentation. In 1985, Shapiro studied the possibility of regeneration of interdental papillae using periodic curettage. He stated that repeated scaling, root planning, and curettage of the papillary tissue every 15 days for 3 months may induce a proliferative hyperplastic inflammatory reaction of the papilla and may be used to reconstruct papillae destroyed by acute necrotizing ulcerative gingivitis.⁽⁹⁾ Han and Takie, proposed a technique wherein a semilunar incision is given on the base of the papilla and the entire papillary gingival unit is freed and pushed incisally with incorporation of connective tissue graft. They postulated that The semilunar incision allows

the coronal displacement without creating tension and prevents the gingiva from rebounding back to its original position.⁽⁶⁾

Beagle (1992) proposed a roll technique, but the disadvantage with this technique is that there is risk of damage to the incisive nerves and vessels. More over chances of incorporation of fat beneath the flap might interfere with vascularization. Furthermore, obtaining a uniform thickness of the flap from the palate and retention of periodontal dressing is difficult.⁽¹⁰⁾

In this case we have used Han and Takie technique for papilla augmentation. Instead of connective tissue PRF was used. Platelet rich fibrin has the advantage over the standard connective tissue graft as a secondary surgical site is avoided, it is easier to procure and. In addition, it has mechanical adhesive properties and biological functions like fibrin glue, that enhances neoangiogenesis, reduce the necrosis and shrinkage of flap.⁽¹¹⁾

The dense fibrin matrix will be stable enough to fill the papillary space. The release of growth factors like platelet-derived growth factor (PDGF), transforming growth factor-beta (TGF-b), insulin-like growth factor Fibroblast growth factor (FGF), Epidermal growth factor (EGF).are very favourable for regeneration. ⁽¹²⁾Moreover with PRF there is a consistent release of these growth factors for minimum of 7 days.

In a study conducted by Alka kaushik et al using Han and Taeki technique with connective tissue graft. There was a mean decrease in the papilla presence index score and distance from the contact to the gingival margin, but it was statistically not significant. also , there is increase in the width of the keratinized gingiva which is statistically highly significant⁽¹³⁾

In this case with use of PRF there was significant increase in the soft tissue height at 3 and 6 months and by 6th months post op complete papillary fill was obtained. A similar report by Tanjore et al showed that by 10th day post op, there was partial fill and by 6 months papilla filled the interproximal embrasure to the same level as in the proximal

teeth evident by conversion of PIS from 1 to 3 ⁽¹⁴⁾

The wound healing was satisfactory and complete healing seen 3 week post operatively. The use of PRF in this study presented a favourable esthetic result. There was excellent color match with the adjacent tissues post operatively after healing. This was very similar to the results achieved by use of connective tissue grafts.⁽⁷⁾

However long time follow ups of the case is required to determine the stability and consistency of the results.

CONCLUSION:

Though lot of studies have shown that use of connective tissue grafts have produced esthetically pleasing, consistent predictable results, this report shows vary similar results are obtained with the use of PRF. From this case it is evident that PRF is a simple and good alternative biomaterial for effective augmentation of lost interdental papilla.

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