

Case Report

A novel surgical procedure for papilla reconstruction using connective tissue graft and platelet rich fibrin: A case report

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Abstract

If the search for beauty is timeless, then having the perfect smile is always in style. One of the techniques to achieve that is regaining the lost interdental papilla. There has been a definitive void in the dental arena pertaining to papilla esthetic. Loss of interdental papilla prompts to phonetic, functional, and esthetic problems. Surgical techniques are multifarious, but are perplexing and very erratic. The refurbishment of the lost papilla is elusive. Previous attempts have been made to augment the interdental papilla using displaced flaps, connective tissue grafts and repeated inflammatory stimulation with diverse results. This clinical study was aimed to reconstruct the lost or blunted interdental papillae with connective tissue graft and plasma rich fibrin for esthetic purpose and for maintaining oral health with the objective to determine the extent to which the procedure can revert the maxillary esthetic.

Key words

Aesthetics, Connective tissue graft, PRF, Maxilla, Papilla.

Introduction

Esthetic awareness has improved vastly in the last decade. The advent of periodontal plastic surgery has made it possible to address the common esthetic concern of receded gingiva.

However, till date, the most challenging scenario lies in the enhancement of lost inter dental papillae in the maxillary anterior region. Loss of inter dental papilla causes not only an esthetic and phonetic dilemma but also a functional

impairment as it predispose to food accumulation [1].

The inter dental papilla of the incisor region is usually pyramidal in shape. Factors which influence the presence or absence of inter dental papilla are crestal alveolar bone height, dimensions of the inter proximal space, soft tissue appearance (thick or thin biotype), minimal buccal plate thickness, type of contact area (triangular versus square), and the biologic width [2].

The papillary form and the corresponding inter proximal embrasure share a special and intricate relationship. An ideal embrasure will house the entire papillae without impinging it with a pointed end extending to the top of the contact point, leaving no space in between the two, thus not favouring food entrapment or being aesthetically displeasing [1].

Classification of the Loss of Interdental Papilla

A classification for the loss of papilla height was proposed by Nordland and Tarnow. This classification is based on three anatomic landmarks: interdental contact point, facial apical extent of the CEJ, and interproximal coronal extent of the CEJ. Four classes were identified [3]:

- **Normal:** Inter dental papilla fills the embrasure to the apical extent of the inter dental contact point area.
- **Class I:** The tip of the interdental papilla lies between the interdental contact point and the most coronal extent of the inter proximal CEJ
- **Class II:** The tip of the inter dental papilla lies at or apical to the inter proximal CEJ but coronal to the apical extent of the facial CEJ
- **Class III:** The tip of the inter dental papilla lies level with or apical to the facial CEJ

Inter dental papilla functions in two ways: By acting as a biological barrier, it protects the

periodontium and also have an important role in esthetics [4]. Various non-surgical and surgical techniques have been used over years for the reconstruction of the inter dental papilla.

Case report

A 30-year-old female patient reported to the Department of Periodontics, D J College of Dental sciences and Research, Modinagar, with the chief complaint of loss of gums between the upper front teeth. On examination, there was a loss of papilla between 11 and 21 (**Figure - 1**). A detailed medical and dental case history was recorded followed by scaling and root planning. After phase I therapy, surgical reconstruction of interdental papilla was performed followed by use of connective tissue graft and platelet rich fibrin.

Figure - 1: Pre-operative photograph.



Surgical procedure

Local infiltration anesthesia was administered, and an incision was given as in a pouch and tunnel technique (**Figure - 2**). Sulcular incisions were given with a number 15 blade. Care was taken not to extend the incisions till the tip of the inter dental papilla. A full thickness mucoperiosteal flap was reflected, extending beyond the mucogingival junction. This was done so as to reduce the tension on the flap to facilitate coronal displacement following placement of the graft (**Figure - 3**). Each pedicle was undermined gently, without detaching it completely to prepare a tunnel. The undermining of tissues to prepare the tunnel was done by extending it laterally about 3-5 mm. The connective tissue graft was harvested from the

palatal region and used to cover the embrasure. PRF was prepared and used along with the connective tissue graft (**Figure - 4, 5**).

Figure - 2: Pouch and tunnel technique.



Figure - 3: Gingiva pulled down.



Figure - 4: Connective tissue graft placed.



Figure - 5: PRF placed.



The free end of the flap was sutured with the adjacent gingiva with 4-0 silk sutures so as to suspend the papilla between adjacent teeth (**Figure - 6**). Periodontal dressing was applied to the labial aspect of the surgical site (**Figure - 7**). Antibiotics and analgesics were administered. The dressing and the sutures were removed after 2 weeks, and oral hygiene instructions were given and healing was found uneventful.

Figure - 6: Suture Placed.



Figure - 7: Periodontal dressing given.



Figure - 8: Post-operative photograph.



Preparation of platelet-rich fibrin (PRF)

The PRF preparation protocol is very simple. Around 5 ml of whole venous blood is collected in each of the two sterile vacutainer tubes of 6 ml capacity without anticoagulant. The vacutainer

tubes are then placed in a centrifugal machine (**Figure - 6**) at 3000 revolutions per minute (rpm) for 10 minutes, after which it settles into the following layers: red lower fraction containing red blood cells, upper straw coloured cellular plasma and the middle fraction containing the fibrin clot (**Figure - 7**). The upper straw coloured layer is then removed and middle fraction is collected, 2 mm below lower dividing line, which is the PRF (**Figure - 8**). A fibrin clot is then obtained in the middle of the tube, just between the red corpuscles at the bottom and acellular plasma at top. Platelets are trapped massively in the fibrin meshes (**Figure - 9 to 12**).

Figure - 9: Laboratory centrifuge.



Figure - 10: Blood in the vacutainer tubes.



Figure - 11: Isolated Platelet-rich fibrin by separating the middle fraction from the centrifuged blood.



Figure - 12: Platelet-rich fibrin ready for use.



Discussion

Several reasons contribute to the loss of interdental papillae and the appearance of “black triangles” between teeth. The surgical reconstruction of the papilla is a perplexing task because the only source of blood supply of the interdental papilla originates from the base of the papilla. The arterioles arising from the crest of the alveolar bone, the periodontal ligament and the gingival tissue all anastomose and form a plexus at the interdental papillae [5, 6].

Beagle in 1992 attempted to reconstruct the lost interdental papilla by using displaced flaps [7]. Han and Takei in 1996 were the first to propose papillary reconstruction using soft tissue grafts [5]. They used two incisions to mobilize the gingivo-papillary unit, the first one being the semilunar incision apical to the mucogingival

junction and the second one being the crestal incision. They then inserted in CTG and sutured the site. Pellegrine modified Takei's technique by folding the CTG to provide adequate thickness of the attached gingiva [8]. Azzi in 1988 proposed a surgical technique in which a partial thickness flap is reflected in the labial and palatal region and the graft procured from the tuberosity is placed and sutured under the labial and palatal flaps [9]. Azzi in 1999 proposed another technique for the management of recession and lost interdental papilla in which a semilunar flap was elevated followed by split thickness elevation in the buccal flap and full thickness in the papilla attached to the palatal flap [10].

The modification projected in this case report provides satisfactory results. However, an ideal patient selection and meticulous oral hygiene procedures instigated by the patient are of utmost importance for the success of the treatment.

Conclusion

The absence or loss of the interdental papilla is one of the most important aspects in the decision-making process of clinicians. With the increasing cosmetic demands of patients, dental procedures like papillary reconstruction are under constant modification. The present case report can resolve the problem and impart better results.

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