Simultaneous Surgical Excision of Localized Gingival Overgrowth and Papilla Reconstruction with Subepithelial Connective Tissue Graft; a Case Report.
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INTRODUCTION
Periodontal plastic surgery is an important part of periodontal therapy. One of the goals of periodontal plastic surgery is the reconstruction of interdental papilla that has been lost from either periodontal disease or previous pocket eradication therapy. Numerous clinicians have proposed, interdental papilla reconstruction techniques, with varying degrees of success. Han and Takei (1996) described a technique consisting of a pedicle graft using a semilunar incision and the coronal displacement of the entire gingival papillary unit. A subepithelial connective tissue graft is placed beneath the coronally positioned interdental tissue. Azzi et al. (1998) described an envelope split thickness flap, elevated buccally and palatally to place connective tissue graft harvested from the tuberosity area. The buccal and palatal flaps are then sutured with connective tissue graft underneath. Azzi et al. (1999) performed a surgery to achieve root coverage and papilla reconstruction in a patient with class IV recession. A subepithelial connective tissue graft harvested from the tuberosity area is positioned in an envelope flap elevated with an incision performed at the level of mucogingival junction. The connective tissue and coronal displacement of the flap allow simultaneous treatment of gingival recession and interproximal missing papilla.

The aforementioned techniques differ mainly in the type of incisions, flap design, the manner in which graft is harvested, predictability and quality of outcome. Predictable root coverage procedures focus on enhancement of blood supply at the recipient site, which promotes the survival of donor tissue.

The purpose of this paper is to describe a case of complete papilla reconstruction using an alternative technique involving placement of subepithelial connective tissue graft, and to discuss the factors that have influenced the results.

CASE DESCRIPTION
A healthy female patient aged 55 years reported to department of Periodontics, H.K.E Society’s S. Nijalingappa institute of dental sciences and research, Gulbarga, Karnataka with the complaints of bleeding and swelling in gum in lower left posterior region of mouth, since 4 months. The lesion was of negligible size when the patient first noticed it (4 months ago), but had grown slowly over the past 4 months to attain the present size.

Clinical examination revealed a discrete spherical tumor-like sessile lesion that measured 8mm in diameter located interproximally between left mandibular first and second molar involving the interdental papilla and part of attached gingiva. Enlarged gingiva was bright red, soft, friable and...
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had smooth shiny surface (Fig. 1).

**Figure 1**
Fig. 1- Localized gingival overgrowth

Bleeding occurred on slight provocation. The periodontal pocket depth was measured to the nearest millimeter using a manual periodontal probe (Hu Friedy ® William’s graduated probe). There was a 7mm deep suprabony pocket. In addition, the simplified oral hygiene index score was 3.8, which showed that the patient had poor oral hygiene. Intraoral periapical radiograph of that region showed mild horizontal bone loss (Fig. 2). Based on the overall clinical findings it was diagnosed as nonspecific conditioned gingival enlargement (pyogenic granuloma) and mild chronic localized periodontitis involving mandibular first and second molar.

**Figure 2**
Fig. 2- Intra Oral Periapical radiograph showing mild horizontal bone loss in interdental region between first and second molar

**SURGICAL TECHNIQUE**

Preparation of the patient included careful scaling, root planing, and oral hygiene instructions. Routine blood tests (i.e. Hemoglobin percentage, Total leukocyte count, Differential leukocyte count, Bleeding time, clotting time) were advised to the patient (as the patient had to undergo a surgical procedure.) The blood tests’ results were normal. Immediately prior to the surgical procedure, the patient was instructed to rinse her mouth for 30 seconds with 0.2% chlorhexidine gluconate solution. The surgery was performed under local anaesthesia with 2% lignocaine containing epinephrine at concentration of 1:80,000.

Surgical excision of the pyogenic granuloma was done. The specimen was sent for histopathological examination. As the lesion involved interdental papilla and part of attached gingiva, total surgical excision led to interdental papilla loss, eradication of suprabony periodontal pocket and loss of part of attached gingiva, which exposed underlying interproximal bone.

The exposed root surface was thoroughly planed. An intrasulcular incision was performed using No. 15 blade around the facial surface of the mandibular left first and second molar. A full thickness envelope flap was elevated buccally well beyond the mucogingival line. A vertical releasing incision was given creating triangular flap (Fig. 3), buccal to left mandibular second premolar and incision was extended to mucogingival line. Care was taken not to perforate the flap and damage the mental nerve.

**Figure 3**
Fig. 3- Excision of gingival overgrowth and vertical incision to prepare recipient site.

The donor site was located on the palate (Fig. 4). The size of subepithelial connective tissue graft was determined based
on the depth and width of the defect created by surgical excision of pyogenic granuloma.

**Figure 4**  
Fig.4- Donor site

The donor connective tissue without an epithelial collar was harvested after raising a partial thickness flap in the bicuspid area with no.15 blade (Fig. 5).

**Figure 5**  
Fig. 5- Connective tissue graft

The epithelial layer at donor site was kept intact to facilitate healing by primary intention. After the graft was separated, the loose tissue tabs from the undersurface were removed and the epithelium was trimmed. The submucosa in the posterior region is thick and fatty and hence it was trimmed to avoid interference with vascularization. The donor site was sutured using No. 4/0 black braided silk (Fig. 6).

**Figure 6**  
Fig. 6- Sutures placed at donor site

The connective tissue graft was placed on the buccal aspect of first and second molar covering the interproximal bone (Fig. 7).

**Figure 7**  
Fig. 7- Connective tissue graft at recipient site

Pressure was applied with sterile gauze soaked in saline for 2 minutes to reduce the dead space and prevent formation of blood clot. The subepithelial connective tissue graft was stabilized with sling suture using No. 5/0 vicryl suture material. Triangular flap was coronally repositioned to cover all but, 1 to 2 mm of tip of the connective tissue graft and sling suture was placed using No. 4/0 black braided silk (Fig. 8).
The surgical area was protected by periodontal dressing for 7 days (Fig. 9).

Figure 8
Fig. 8- Recipient site with sutures placed

The patient was instructed to apply cold compresses on the face over the surgical area during the first few hours postoperatively. The following medications were prescribed: amoxicillin (500 mg three times a day for 5 days) and Ibuprofen (500 mg twice a day for 3 days). The patient was instructed to rinse twice a day with 0.2% chlorhexidine gluconate and not to use any mechanical plaque control device in the surgical site for 2 weeks. This would include use of a toothbrush, dental floss, and any interdental cleaning device. The postoperative period was uneventful, with no pain or hemorrhage. Silk sutures were removed 8 days after surgery; at that time, advanced healing was observed at both the recipient and donor sites. Plaque control was checked and oral hygiene reinforced at every postoperative visit. After 2 weeks, mechanical plaque control was advised using an ultra soft toothbrush.

Patient was recalled after one, three and six months. Six months after surgery, the palate appeared normal; the previously exposed root surface was covered with healthy gingival tissue and there was reconstruction of interdental papilla, which remained stable (Fig. 10, 11 and 12).

Figure 9
Fig. 9- Periodontal dressing

Figure 10
Fig. 10- Recipient site after 1 month

Figure 11
Fig. 11- Recipient site after 6 months
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DISCUSSION
In the oral cavity, pyogenic granulomas show a striking predilection for the gingiva, with interdental papillae being the most common site in 70% of the cases. The diagnosis of the lesion was done clinically and histopathologically. Histopathologically pyogenic granuloma appears as mass of granulation tissue with chronic inflammatory cell infiltration. Endothelial cell proliferation and formation of numerous vascular spaces could be seen (Fig: 13 and 14).

Treatment consists of removal of lesion plus the elimination of irritating local factors, plaque and calculus. In this case, excision of the pyogenic granuloma resulted in complete interdental papilla loss and part of attached gingiva. The need to restore structural integrity of the keratinized attached gingiva as well as reconstruction of interdental papilla presented a technically challenging situation.

Subepithelial connective tissue graft was used because numerous studies show predictable results using subepithelial connective tissue grafts for the correction of denuded root surface and a few case reports on papilla reconstruction. Subepithelial connective tissue graft is also predictable source of increasing the zone of keratinized gingiva.

Full thickness flap/ subepithelial connective tissue grafting for root coverage has been reported. Nelson’s technique and Muller’s technique both used a full thickness flap with vertical releasing incision at the recipient site. There is rapid capillary proliferation from the periosteal surface of the overlying full thickness flap approximating the outer surface of the connective tissue graft. The previous techniques were used mainly for coverage of denuded roots.

The techniques that have been proposed to reconstruct the interdental tissue used mainly split thickness flaps with or without releasing incisions. Some used full thickness flap like, Azzi et al. performed a surgery using full thickness envelope flap with an incision performed at the level of mucogingival junction. Tinti et al. performed a buccal
dislodgment of full thickness flap raised from a site slightly more palatal with respect to implants. The techniques discussed above described full thickness envelope flaps used in maxillary anterior sextants.

The triangular flap is formed by horizontal, intrasulcular incision and one vertical releasing incision, usually placed at the mesial end of the prospective flap. The triangular flap is mainly indicated for treatment of cervical resorptions, perforations, and resections of short roots. The main advantages of this flap design are that it affords good healing, which is a result of minimal disruption of the vascular blood supply to the flapped tissues and ease of flap re-approximation with a minimal number of sutures required. It also decreases the flap tension. It is the only recommended flap design that can be used for mandibular posterior teeth because of anatomical structures.

In this case, we used subepithelial connective tissue graft with full thickness triangular flap, which was coronally repositioned. The mobility of the overlying flap was achieved by extending the blunt dissection beyond the mucogingival line and giving a vertical incision creating a triangular flap. A single vertical incision was used to minimize interruption of the superficial and intramural vascularization and lateral and apical blood supplies to the submerged connective tissue graft. The additional blood supply comes from the intimate contact of connective tissue to the overlying full thickness flap.

The small dimension of the interproximal space hinders predictable results of papilla reconstruction. The recipient site of the interdental space borders the non-vascularized tooth surfaces, providing a small surface area for grafting. In this case, there was horizontal bone loss interproximally between the first and second molar leaving a broad base of interdental bone. A positive aspect of having a large interdental area is that it provides the support and adaptability for overlying connective tissue graft and a source of blood supply from the flap to the graft.

The width of the keratinized tissue was restored and thickness of gingiva at the recipient site was increased. Connective tissue underneath the alveolar mucosa would form a base and function as masticatory mucosa.

The positive association between recession reduction and thickness of the flap was shown by Baldi et al. Complete root coverage at sites with Miller’s class I and class II recessions was obtained only when the flap thickness was 0.8 mm. In this case, the thickness of the flap was adequate to provide sufficient blood supply to the underlying connective tissue.

Blood clots, even small ones, might compromise immediate blood supply to the graft and therefore induce partial necrosis of the transplanted tissue. In this case, the harvested graft was placed in the recipient site and pressure was applied with sterile gauze soaked in saline for 2 minutes to prevent the development of blood clot between bone and grafted connective tissue.

**CONCLUSION**

This case has shown that surgical technique using subepithelial connective tissue graft with full thickness triangular flap, which was coronally repositioned, can regenerate lost interdental papilla and restore adequacy of width of attached gingiva. The reconstructed papilla remained stable and without any clinical signs of inflammation for 6 months after surgery. Clinical studies using large sample sizes are necessary to determine the long-term success rate and predictability of this surgical technique.

Atraumatic management of the tissues, respect for the blood supply, avoiding tension and pressure, and adequate dimension of interdental space are critical for the viability of the tissues and success of the procedure.

**CLINICAL SIGNIFICANCE**

Loss of periodontal papilla can occur as a result of periodontal disease or periodontal surgical procedures aimed at removal of gingival enlargements. Reconstruction of interdental papilla is always a quest for skillful periodontist. The surgical technique described above predictably increases the width of the attached gingiva and reconstructs the lost papilla by providing maximum blood supply and intimate donor tissue contact, thus ensuring good result.

**References**

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