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Surgical Reconstruction of Interdental Papilla Using Interposed Subepithelial Connective Tissue Graft- A Case Report

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Abstract

Periodontal plastic surgery enables enhanced esthetics in the anterior maxillary region. Reconstruction of the interdental papilla is one of the most challenging and least predictable of treatments. Several surgical and nonsurgical procedures to rebuild lost papillae have been presented; however, good results have been elusive. A case report is presented here to demonstrate a technique by which a collapsed interdental papilla can be surgically reconstructed by a novel surgical procedure based on an advanced papillary flap combined with a connective tissue graft intended to augment the soft tissue in the interdental area.

Keywords: Papilla reconstruction, black triangle, connective tissue graft.

Introduction

The responsibility of current surgical procedures for papilla reconstruction has been a matter of concern for periodontists and patients. Opening of the interproximal spaces can produce: a) Severe esthetic and functional abnormalities b) phonetic problems c) As a consequential need, soft tissue augmentation procedures are being developed to regenerate lost interdental papillae. d) One of the major esthetic challenges in periodontal plastic surgery is related to the ability of rebuilding lost papillae in the maxillary anterior segment. **Tarnow et al (1990)** have demonstrated that the most significant factor in determining the presence of interdental papilla is the distance from contact point to crest of bone. When the distance is 5mm or less, the papilla is almost always present and when distance is 7mm or more the papilla is usually missing. Interdental papillae can be lost as a result of distinct clinical situations**:** a) Naturally occurring midline diastema. b) Diverging roots in presence of interproximal space when the contact point between two clinical crowns is situated too incisal. c) If a clinical crown is triangular in shape because of accentuated discrepancy in the mesiodistal width at the incisal edge

and gingival line. d) Tooth extraction. e) As a result of certain periodontal surgical procedures Surgical techniques aiming at correcting black triangle have been used mainly with: a) Free gingival grafts b) Repeated interproximal curettage c) Displacement of the interproximal palatal tissue in the buccal direction. The major limiting factor for the complete and predictable survival of graft tissues is lack of a minimal source of blood supply. Several surgical procedures that rebuild lost papilla have also been presented. Principles of papilla preservation combined with roll techniques have been reported[1,2]. A pedicle graft using a buccal semilunar incision with coronal displacement of the gingivopapillary unit and subepithelial connective tissue graft has also been applied[3]. Surgical reconstruction of interdental papilla with buccal and palatal thickness flap and a connective tissue graft has also been presented[4].

This case report presents a case in which the semilunar coronally repositioned papilla with connective tissue graft was used to surgically reconstruct lost papilla.

Case Report

- A 24-year-old non-smoking male reported to Dept. of Periodontics, Himachal Dental College, Sundernagar complaining of spacing in gums in relation to left front tooth region. The patient was then undergoing Orthodontic correction for deep bite.

Figure 1

Clinical examination of the patient revealed a class-II papillary loss between the teeth with complete destruction in the buccal and palatal direction.

- The left central and lateral incisors presented.
- 2mm recession on the straight buccal surfaces
- The distance from the gingival margin to bone was 5mm
- There was a 3mm width in the interproximal space at the level of the existing gingival tissue
- 6mm of keratinized tissue was present

Surgical Technique

- Under local anesthesia, a semilunar incision was performed 3mm apical to the mucogingival junction.
- Intra sulcular incisions were made with no 15 blade around the necks of maxillary left central and lateral incisor.

Figure 2

- The donor tissue consisting of 2mm thick palatal connective tissue was harvested and was shaped to fit the interproximal area at the recipient site.

Figure 3

- The flap was undermined and Orban's knife was passed through the sulcular incision to evaluate the extent of reflection.

Figure 4

- The connective tissue graft was tucked in and was pushed coronally to provide more bulk in papillary region allowing for coronal displacement of papillary unit.

Figure 5

Figure 6

- Graft was stabilized in place using a 4.0 suture.
- Post-operative care consisted of 0.12% chlorhexidine rinses two times a day for 2 weeks with no mechanical cleaning of the interproximal area.

Figure 7

Figure 8

Preoperative

6 months post-operative

Results

- The interproximal space was completely filled
- The height and volume of the reconstructed papilla has been maintained
- The buccal recessions were covered around the maxillary left central and lateral incisors
- The keratinized tissue increased to 3 mm

Advantages

- It provides a better source of blood supply from the flap to the graft.
- Maintains papillary integrity and avoids flap necrosis.

Limitations

- Multiple surgical procedures may be required.
- Integrity of interproximal tissue may be lost.

Discussion

There may be several reasons for loss of papilla height and the establishment of black triangles between teeth. The most common reason in the adult individual is loss of periodontal support due to plaque-associated lesions. However, abnormal tooth shape, improper contours of prosthetic restorations and traumatic oral hygiene procedures may also negatively influence the outline of the interdental soft tissues[4]. The case presented here comes under class I of Nordland and Tarnow (1998) classification[5]. Since the distance between bone crest and contact point was ≤5mm and papilla height was less than 4mm, surgical intervention was proposed to increase the volume of the papilla[6]. Harvesting of the graft was performed just before the surgical detachment of the papilla to prevent the displacement of a blood clot between the bone and grafted connective tissue. Blood clots, even small ones might compromise immediate blood supply to the graft and therefore induce partial necrosis of the transplanted tissue[7]. The most predictable soft tissue grafting is achieved by the use of pedicle grafts because the blood supply is derived directly from the base of the mobilized flap. The pedicle flap along with submerged grafted tissue and the primary closure of the recipient site provides an environment of maximum blood supply to the grafted tissues. These factors, as well as the meticulous and careful management of the soft tissues, are important surgical considerations for a predictable and successful result[8]. Since the graft receives nourishment from all directions, flow of plasma and in growth of capillaries from surrounding tissues can be achieved. Depending on the extent of success following the procedure, it can be repeated after several months of healing. The present procedure can be combined with reshaping of the proximal contour of adjacent teeth to enhance results.

Conclusion

This case has shown that surgical technique using an interposed subepithelial connective tissue graft can regenerate lost interdental papilla and the reconstructed papilla remained stable and without any signs of clinical inflammation after surgery.

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