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SURGICAL RECONSTRUCTION OF INTERDENTAL PAPILLA USING AN 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

Periodontal plastic surgery enables enhanced esthetics in the anterior maxillary region where minor surgical procedures can improve gingival contour. One goal of periodontal plastic surgery is the reconstruction of the interdental papilla that has been lost¹.

Several surgical and nonsurgical approaches have been suggested to solve this esthetical problem. Orthodontic approximation can be combined with apical positioning of the contact point through stripping² and in certain cases, change of the tooth contact area can also be achieved with appropriate restorative techniques. Periodic curettage stimulates the regrowth of interdental papilla³.

Several surgical procedures that rebuild lost papilla have also been presented. Principles of papilla preservation combined with roll techniques have been reported^{4&5}.

A pedicle graft using a buccal semilunar incision with coronal displacement of the

gingivopapillary unit and subepithelial connective tissue graft has also been applied⁶.

Surgical reconstruction of interdental papilla with buccal and palatal thickness flap and a connective tissue graft has also been presented⁷.

Insufficient blood supply is the major limiting factor in all the surgical papilla reconstructive and regeneration techniques. The recipient site of the interdental space borders the nonvascularized tooth surfaces, providing small surface area for grafting. Therefore techniques using pedicle or advanced flaps clearly shows better results than those with free grafts⁸.

This case report presents a case in which the semilunar coronally repositioned papilla with connective tissue graft⁶ was used to surgically reconstruct lost papilla.

CASE REPORT

Case description

A 22 year old male presented with chief c/o spacing in his upper front tooth region. The

patient was not medically compromised. Intra-oral examination revealed, class I papilla loss [Fig 1], in 11,21 region according to Nordland and Tarnow classification⁹. The treatment plan was to complete phase I therapy and after re-evaluation, to proceed with surgical therapy. Informed consent was obtained from the patient. Ethical committee clearance was obtained for the same.

Phase I therapy was completed for the patient. The site was re-evaluated after a period of 4 weeks. It was decided to proceed with the surgical phase. After administration of local anaesthesia, 1.8 ml of 2% xylocaine with adrenaline by infiltration, a semilunar incision is made between the mesial line angle of the teeth [11,21] in the alveolar mucosa with no.15 blade and a pouch-like preparation is performed into the interdental area [Fig 2].

Intrasulcular incisions are made with no.15 blade around the mesial and distal half of 11 and 21, to free the flap from the root surfaces and allow coronal displacement of the gingival-papillary unit. The gingival-papillary unit was relieved using an Orban knife [Fig 3 and 4]. The soft tissue was completely released from the root and bone, and the whole flap became mobile, allowing for the coronal displacement of the papillary unit.

A buccal or palatal void could be seen between the soft tissue and the bone. To maintain the whole unit coronally, the dead space was filled with connective tissue graft. A connective tissue graft [Fig 5], procured from the palate by trap door approach was placed into the pouch [Fig 6] to support the coronally positioned interdental tissue. Suturing of the semilunar incision was initiated with 4-0 black silk suture and primary closure was obtained [Fig 7]. Later the palatal donor site was sutured [Fig 8].

No periodontal dressing was used nor was antibiotic therapy recommended. The post operative care consisted of 0.12% chlorhexidine

rinses 3 times a day for 4 weeks, with no mechanical cleansing of the interproximal area.

Follow-Up

Suture removal was done on the 10th post-operative day. Healing was uneventful. Six months after the procedure, the interproximal space was still completely filled and the height and volume of the reconstructed papilla had been maintained [Fig 9].

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 tissues¹⁰.

The case presented here comes under class I of Nordland and Tarnow (1998) classification⁹. Since the distance between bone crest and contact point was ≤ 5 mm and papilla height was less than 4mm, surgical intervention was proposed to increase the volume of the papilla¹¹.

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 tissue¹².

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 result¹³.

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 report has shown that the surgical technique using an interposed subepithelial connective tissue graft can regenerate a lost interdental papilla. The reconstructed papilla remained stable and without any signs of clinical inflammation 6 months after the surgery.

Clinical studies using large sample sizes are necessary to determine the success rate and probability of this surgical technique. We hope that this case-report would become part of a meta-analysis in the future to help plan an evidence-based treatment.

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Fig 1- Pre-operative view



Fig 2 - Semilunar incision



Fig 3 - Recipient site prepared



Fig 4- Recipient site prepared



Fig 5 - Connective tissue graft procured



Fig 6- CTG placed into pouch



Fig 7 - Recipient site sutured



Fig 8: Donor site sutured



Fig 9 - 6 months post-operative view

