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A novel incision design for interdental papilla reconstruction

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Abstract

The loss of interdental papilla poses a challenging situation following excision of sessile growth in the interdental papillae. In such a scenario connective tissue graft (CTG) is considered the gold standard for reconstruction of papilla. In this case report a novel incision design was performed immediately after excision of a sessile mass buccally, preserving the marginal gingiva of adjacent tooth.

Gradual surgical healing with minimal postoperative morbidity and very slight discomfort was observed at 1 week. The clinical observation at 4 weeks revealed complete healing, alongwith the reconstructed interdental papilla.

The result seem to suggest that the novel incision design alongwith with CTG can provide a valid treatment procedure in reconstruction of interdental papilla.

Keywords: interdental papilla, connective tissue graft, gingival margin sparing incision

Introduction

Dental aesthetic awareness among the patients has improved vastly over the last decade. With the advent of periodontal plastic surgery, the common esthetic concerns of receded gums, loss of gingival contour and appearance of unsightly black triangles could be addressed to some extent, if not completely. However, till date, the most challenging scenario lies in enhancement of lost interdental papillae in the maxillary anterior region. Loss of Interdental papilla (IDP) causes not only an esthetic and phonetic dilemma but also a functional impairment as it predispose to food accumulation, leading to the initiation of both caries and periodontal diseases.

The interdental papilla of the incisor region is usually pyramidal in shape. Factors which influence the presence or absence of interdental papilla are crestal alveolar bone height, dimensions of the interproximal space, soft tissue appearance (Thick or thin biotype), minimal buccal plate thickness, type of contact area (triangular versus square), and the biologic width^[1]. Considering hard and soft tissue synergy, interdental papillae behave differently than the facial gingival margin. The free gingival margin averaged 2-3 mm above underlying facial bone, whereas the tip of the papillae is about 4.5-5 mm above the interproximal bone^[2].

In this regard, Tarnow *et al.* in 1992, found that the interdental papillae filled the space when the distance between the contact point and the crest of interdental bone is ≤ 5 mm. When the contact was 6 mm and 7 mm from bone, only 56% and 37% of the papillae could fill the space respectively^[3].

Interdental area is the main site where dental caries and periodontitis can occur. The complex anatomy combined with the vascular supply allows for periodontal disease to progress rapidly and is the most common cause for appearance of black triangles.

Iatrogenically, surgical reflection of interproximal tissues in areas where the distance between the contact and interdental bone is ≥ 5 mm, results in partial loss of interdental papillae. Also it has been seen that surgical excision of growth occurring at the interdental papilla also results in loss of papilla.

This article will describe such a case of surgical management of excision of growth at the interdental papilla along with the reconstruction of papilla in the same surgical seating.

Case report

A 24 year old healthy, non-smoking male patient presented to a private clinic, with the chief

complaint of fear of cancer and of unaesthetic appearance of his gums due to a swelling in the upper front teeth region.

- Clinical examination revealed, a erythematous sessile mass of 4mm x 4mm in the interdental papilla in between #22 and #23 which was non-tender, non pulsatile, non-hemorrhagic, and smooth surface. {Fig. 1, Fig. 2, Fig. 3}
- The soft tissues appeared to be healthy without overt inflammation.
- Scaling and root planing was done and Oral Hygiene Instructions (OHI) was employed.
- After 1 month of non-surgical periodontal therapy, surgical management of the growth through excision followed by reconstruction of papilla with connective tissue graft was planned.
- An informed consent was obtained from the patient before the surgery.



Fig 1: Pre-operative view showing erythematous sessile mass



Fig 2: Horizontal dimension of the growth: 4mm



Fig 3: Vertical dimension of the growth: 4mm

Surgical Procedure

- a. Intraoral antisepsis was performed by rinsing with 0.2% chlorhexidine digluconate for 30 seconds.
- b. Adequate local anesthesia was achieved with 2% lignocaine hydrochloride (epinephrine-1: 1,00,000) through local infiltration technique.
- c. The growth was excised in-toto by giving external bevel incision around it including a healthy tissue margin along with. {Fig. 4}
- d. The excised tissue was preserved in formalin for histopathological examination.
- e. The surgically exposed interdental area was then curetted with Gracey curettes to remove any diseased tissue. {Fig. 5}
- f. It was followed by a gingival margin sparing incision connected by two widely separated vertical releasing incisions. {Fig. 6}
- g. Following which a full thickness mucoperiosteal flap was raised till mucogingival junction (MGJ). Beyond MGJ, a periosteal releasing incision was placed to get adequate mobility for coronal displacement of the flap. {Fig. 7}
- h. In the meantime connective tissue graft of the desired dimension was harvested from the palate using a single incision technique. {Fig. 8}
- i. The CTG was then sutured to the adjacent gingival margins with a 6-0 absorbable suture. {Fig. 9}
- j. The flap was then advanced coronally over the stabilized CTG and a sling suture was placed with a 5-0 silk suture at the tip of the surgical papilla. {Fig. 10}
- k. The vertical releasing incisions were closed with interrupted silk sutures adequately.
- l. No periodontal pack was given.

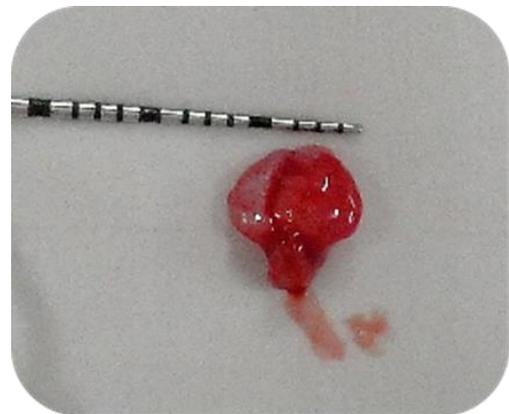


Fig 4: Excised growth



Fig 5: curettage with Gracey curettes to remove any diseased tissue



Fig 6: Gingival margin sparing incision

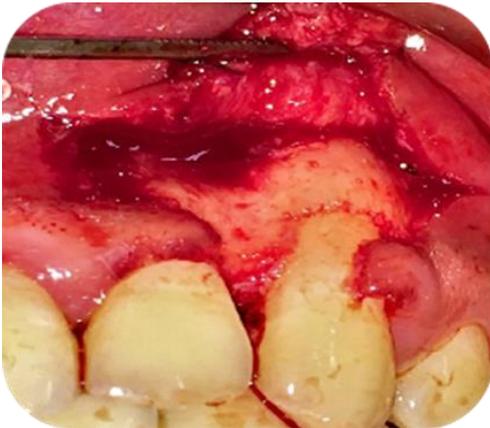


Fig 7: Full thickness flap raised till MGJ



Fig 8: Harvesting of CTG by single incision technique



Fig 9: CTG stabilised to the adjacent gingival margin with absorbable suture



Fig 10: Flap coronally advanced & stabilised with 5-0 silk suture

Postoperative Instructions

Postoperative instructions included

- i. Application of ice-packs over the facial skin for 4-5 hrs (applied for 10 minutes, then removed for 20 minutes (1:2 ratio).
- ii. Patient was advised to take antibiotics (Amoxicillin 500mg tds) for 5 days postoperatively.
- iii. Use of a chlorhexidine gluconate 0.2% oral rinse was advised twice daily for 2 weeks post-operatively.
- iv. Avoidance of brushing at the surgical site for 6 weeks was advocated.
- v. The patient was advised to refrain away from sports activity or any heavy physical work for 1 week.
- vi. Lukewarm or cold semifluid diet on the day of procedure, along with easy-to-chew soft food with no sharp edges for 2 weeks was also advised.

Recall

- Patient was further checked at 2, 6 weeks and 3 months post-operatively.
- Sutures were removed after 2 weeks.
- Light debridement was done at each follow-up appointment as necessary.
- At the sixth week, patient was instructed on the roll brushing technique using an extra-soft toothbrush.
- Thereafter, patient was re-assessed at every periodontal maintenance appointment, which was generally every 3 months.

Result

- On recall examination 4 weeks post-operatively, the surgical site showed complete healing, along with the reconstructed interdental papilla. {Fig. 11}
- The histopathological report of the excised growth gave the diagnosis of a fibroma.
- The patient was followed up after 3 months also, which showed complete soft tissue healing.



Fig 11: Complete papilla reconstruction 4 weeks post-operatively

Discussion

A sea of surgical procedures has been tried out in papilla reconstruction throughout the literature. Shapiro *et al.* advocated use of repeated curettage to stimulate the regrowth of interdental papillae in necrotizing ulcerative gingivitis [4]. The roll technique and the use of pedicle graft with coronal displacement of the gingivopapillary unit and subepithelial connective tissue grafting has been presented [5,6].

However, even with these different surgical techniques with different flap designs, results are elusive, not predictable and long-term stability are lacking.

The case presented here described the use of a gingival margin sparing incision along with CTG to reconstruct the interdental papilla. The flap design proposed in this case report served a couple of advantages:

- i. Preservation of adjacent gingival margin.
- ii. Wide base of the flap ensured good blood supply for uneventful healing.

The periosteal releasing incision given beyond the MGJ helped in achieving adequate coronal advancement of the flap as well reduced its shrinkage during early healing period [7].

Additionally, harvesting CTG by a single incision technique also reduced much post-operative discomfort of the patient thereby increasing patient compliance [8].

In this case the CTG was sutured to the adjacent gingival margins. The author proposes another technique of stabilizing the CTG by directly suturing it to the under surface of the flap with an absorbable suture.

Conclusion

In conclusion, the case report shows a novel surgical procedure using a gingival margin sparing incision and CTG to regenerate a surgically lost interdental papilla due to the excision of growth. The reconstructed papilla in the new position was stable when reviewed at 3 and 6 months postoperatively.

However, studies with a longer study period are required to determine the success rate and the predictability of this procedure.

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