Surgical Reconstruction of Interdental Papilla in Mandibular Anterior Region : A Case Report

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Abstract

The loss of interproximal dental papilla may cause functional, phonetic, and esthetic problems. Complete and predictable restoration of lost interdental papilla remains one of the biggest challenges in periodontal reconstructive surgery. Non-surgical approaches (orthodontic, prosthetic and res torative procedures) modify the interproximal space, thereby inducing modifications to the soft tissues. The surgical techniques aim to recontour, preserve and reconstruct the soft tissue between the teeth. This case report demonstrates reconstruction of the papilla in the mandibular anterior region using connective tissue graft obtained from the palate with 6 months follow-up.

Key words: Interdental papilla, Papilla reconstruction, Connective tissue grafting.

Introduction

Reconstruction of interdental papilla has been considered as a challenging task and often complete refill of the missing interdental papilla is elusive. The treatment of a missing interdental papilla is based upon the etiology which can be improper root angulation, deficient tooth size, or true loss of interdental papilla due to periodontal disease1. Diastema occurring due to divergent roots can result in an interproximal space with the contact point situated too incisally. Orthodontics can correct such clinical situation by aligning the roots and squeezing the interdental papilla2. An open interproximal space due to triangular shaped crowns can be corrected by restorative procedures3. There are a select group of cases where the tooth dimensions, the position of the contact point and the angulations of the teeth are normal, in which surgical treatment approach is indicated.

The biggest challenge for reconstructing the interdental papilla surgically has been the small recipient site of the interdental space where papilla has to be created , with its limited blood supply. Use of techniques such as free gingival grafting poses a potential risk of failure, since the surface area for blood supply to the donor tissue is minimal in the restricted interdental space4.The healing principle on which subepithelial connective tissue graft for root coverage 5 and ridge augumentation are based (double blood supply) has also been applied to the reconstruction of the interdental papilla, thus increasing both success rate and predictability.

The article describes a case report in which the interdental papilla was surgically reconstructed using sub epithelial connective tissue grafting.

Case Report

A 20yr old female patient was referred following orthodontic therapy for the management of the lost interdental papilla in mandibular central incisor region. Soft tissue examination in this area revealed a good gingival health, absence of any clinical signs of inflammation and a deficient papilla in between 31 and 41 region, with sulcus depth not exceeding 2mm. Aberrant multiple frena were present in relation to the labial aspect of 31 and 41, about 3-5mm below the gingival margin (figure 1). Pre orthodontic records demonstrated crowding in the mandibular anterior region. As the teeth were uprighted, the interdental papilla collapsed creating a 'black triangle'.

Preliminary phase included oral prophylaxis and oral hygiene instructions. The interdental papilla between 31 and 41 and the adjoining area was anesthetized by i nfiltration. Periodontal probe measurements were made from the existing gingival crest to the contact point. There was 5mm interproximal distance vertically from the contact point to the soft tissue interface (figure 1) and 3mm distance from the crest of the existing papilla to the crest of the bone. There was 2.5mm width measured in the interproximal space at the level of the existing gingival tissues (figure 2).

Surgical Procedure

The frenum was relieved in the first step surgery and allowed to heal for 2 weeks (figure 3). In the second step surgery a split thickness semilunar incision was performed from the disto labial aspect of 31 to the distolabial aspect of 41, starting 2mm from the gingival margin and apically extending 3mm beyond the mucogingival junction, using No.15 blade (figure 4). Intrasulcular incisions were then made around the necks of the teeth 31 and 42 both labially and lingually. The existing papilla was fully preserved. The gingivo papillary unit in the area was released from the underlying tissues using a split thickness flap (figure 5). Care was taken to avoid damage to the interproximal papilla. Immediately after this procedure, the donor

tissue consisting of connective tissue from the palate was harvested from premolar-molar region (figure 6). It was then shaped to fit the interproximal area (figure 7).

After the whole flap was mobilised from the underlying tissues, the connective tissue graft was placed beneath the flap. It was stabilized in place using 5-0 resorbable suture. The overlying flap was closed without any tension using 4-0 non resorbable suture. A non-eugenol pack was placed over the surgical site. Patient was advised to use 0.2% chlorhexidine 2 times for 7 days for the oral hygiene maintenance. Sutures and dressings were removed after 10 days. Healing proceeded uneventfully and oral hygiene maintainence using a toothbrush was demonstrated 4 week post operatively (figure 8).

A similar surgical procedure using connective tissue grafting from the palate with identical protocol was performed in the same area after 8 weeks. Healing following the two surgical procedures was uneventful .

Discussion

The literature on papilla reconstruction is limited to case reports[6, 7]. The success of this procedure is dependent on number of factors such as subepithelial connective tissue, which supports the coronally positioned papilia. The space between the bone and coronally positioned papilla is completely filled with connective tissue, which should be well stabilized during suturing. Primary closure of the coronally displaced flap is another important factor. Azzi et al have demonstrated the use of autogenous bone grafts in conjunction with connective tissue grafts to reconstruct lost papillae in periodontally involved teeth[7].

It is clinically well documented that any form of pedicle grafting is much more predictable than free grafts if proper donor tissue is found adjacent to the recipient site, since there is good blood supply from the base of the pedicle[4]. The sub epithelial connective tissue graft for root coverage proposed by Langer and Langer combined a coronally positioned flap with connective tissue grafting[8]. Tarnow used semilunar coronally repositioned flap with success to cover denuded root surfaces[9]. These procedures have a high predictability as they maximize the blood supply to the donor tissue thereby facilitating the “take” of the graft[4].

In the present case, collapse of interdental papilla following orthodontic therapy resulted in esthetic disappointment for both the patient and the orthodontist. Since proportional size of the crowns were present and in this case there was no scope for further improvement in root angulations as per the orthodontist's view, surgical reconstruction was considered. The amount of papilla reconstruction was considerable and the gingiva in the surgical area was thin which necessitated incremental graft placement using two surgical interventions The flap design allowed for maximum papillary preservation and its blood supply thereby enhancing the graft placement and stabilization. Additional improvements in cosmetics could be created by restoring the contact point with tooth colored restorative material.

Conclusion

The case has shown that surgical technique using an interposed sub epithelial connective tissue graft can regenerate a lost interdental papilla. The reconstructed papilla remained stable even after 6 months of surgery (figure 9). Clinical studies using large sample size should be conducted to determine the predictability of the surgical technique.

References

1. Kokich VG. Esthetics: the orthodontic-periodontic restorative connection. Semin Orthod 1996 Mar;2(1):21-30
2. Nanda R, Torres dias MA. Orthodontic space closure. Dent Clin North Am 1981; 16: 231-39
3. McGuire MK, Miller L. Maintaining esthetic restorations in the periodontal practice.Int Periodontics Restorative Dent. 1996 Jun; 16(3): 230-9.
4. Han TJ, Takei HH.Progress in gingival papilla reconstruction. Periodontol 2000. 1996 Jun;11:65-8.
5. Raetzke PB. Covering localized areas of root exposure employing the "envelope" technique. J Periodontol. 1985 Jul;56(7):397-402.
6. Surgical reconstruction of the interdental papilla. Azzi R, Etienne D, Carranza F. Int J Periodontics Restorative Dent. 1998 Oct;18(5):466-73.
7. Root coverage and papilla reconstruction using autogenous osseous and connective tissue grafts. Azzi R, Takei HH, Etienne D, Carranza FA. Int J Periodontics Restorative Dent. 2001 Apr; 21(2):141-7
8. Langer B, Langer L. Subepithelial connective tissue graft technique for root coverage.J Periodontol. 1985 Dec;56(12):715-20.
9. Tarnow DP. Semilunar coronally repositioned flap. J Clin Periodontol. 1986 Mar;13(3):182-5

Legends

Fig. 1: Vertical height from contact point to soft tissues
Fig. 2: Horizontal width of the interdental space
Fig. 3: Frenotomy procedure
Fig. 4: Semilunar incision
Fig. 5: Release of gingivo-papillary unit using split thickness flap
Fig. 6: Harvested connective tissue graft
Fig. 7: Graft in place
Fig. 8: After first step of papillary augmentation
Fig. 9: After 6 months of second stage of papillary augmentation


Fig. 1


Fig. 2


Fig. 3


Fig. 4


Fig. 5


Fig. 6


Fig. 7


Fig. 8


Fig. 9