



FRENECTOMY WITH UNILATERAL DISPLACED PEDICLE FLAP: A CASE REPORT

Periodontology

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ABSTRACT

Maxillary labial frenum is capable of creating a diastema and recession, affecting aesthetics. Archer's classical frenectomy technique is an extensive procedure which causes scarring and loss of interdental papilla. This leads towards the conservative approaches like Edward's frenectomy, frenum relocation by Z-plasty and free gingival graft. Since the procedure of frenectomy was first proposed, a number of modifications have been developed to solve the problem caused by an abnormal labial frenum. A better approach to make a primary closure in midline and to avoid anesthetic scar by creating a zone of attached gingiva, frenectomy is assisted with lateral pedicle graft. The interdental papilla is left surgically undisturbed and healing takes place by primary intention. Miller, in his study on 27 subjects, suggested that the newly created zone of attached gingiva might have bracing effect inhibiting reopening of diastema. A case series of this technique with its distinct advantages is presented.

KEYWORDS

Aberrant frenum, frenectomy, lateral pedicle graft

INTRODUCTION:

A frenum is an anatomic structure formed by a fold of mucous membrane and connective tissue, sometimes muscle fibres. The superior labial frenum is triangular in shape and attaches the lip to the alveolar mucosa and/or gingiva. It extends over the alveolar process in infants and forms a raphe that reaches the palatal papilla. Through the growth of alveolar process as the teeth erupt, this attachment generally changes to assume the adult configuration^[1].

Placek et al^[2] in 1974 have classified the labial frenal attachments as

1. Mucosal – fibres attached up to mucogingival junction.
2. Gingival – fibres inserted within attached gingiva.
3. Papillary – fibres extending into interdental papilla
4. Papilla penetrating – the frenal fibres cross the alveolar process and extend up to palatine papilla.

Clinically, papillary and papilla penetrating frenum are considered as pathological and have been found to be associated with loss of papilla, recession, diastema and plaque accumulation^[3,4]. Abnormal or aberrant frena are detected visually, by applying tension over it to see the movement of papillary tip or blanch produced due to ischemia of the region^[5]. Miller has recommended that the frenum should be characterised as pathogenic when it is unusually wide or there is no apparent zone of attached gingiva along the midline or the interdental papilla shifts when the frenum is extended^[6]. In such cases, it is necessary to perform a frenectomy for aesthetic, psychological and functional reasons.

In the "classical frenectomy" by Archer^[7] and Kruger^[8] the frenum, interdental tissue and palatine papilla are completely excised leading to exposure of underlying alveolar bone and thus leading to scarring. This technique resulted into an unesthetic scar, but this approach was advocated to assure removal of muscle fibres, supposedly connecting the orbicularis oris with the palatine papilla. It was thought that if this was not done, the diastema would reopen.

Edward^[9], evaluating 308 patients who demonstrated either a diastema or an abnormal frenum or a combination of both, advocated a "conservative surgical procedure". His method consisted of three procedures:

1. Apically repositioning of the frenum with denudation of alveolar bone.
2. Destruction of the trans-septal fibres between the approximating

central incisors.

3. Gingivoplasty of any excess labial and/or palatal tissue in the interdental area.

One of the characteristics of Edward's technique was the esthetic maintenance of the interdental papilla. But the healed scar in the midline appeared unesthetic to the subjects.

Coleton^[10] and Lawrence^[11] have used free gingival graft combined with frenectomy. This procedure avoids the scar but a mismatched gingival colour in midline and need of a second surgical site to achieve donor tissue complicate the technique. Laser has been used by various clinicians which has its relative advantages and disadvantages.

In many cases it is necessary to perform a frenectomy to prevent reopening of a midline diastema following closure by orthodontic therapy. Often the loss of the interdental papilla between the maxillary incisors during the classic frenectomy creates an unacceptable esthetic result. A better approach to make a primary closure in midline and to avoid anesthetic scar by creating a zone of attached gingiva, frenectomy is assisted with lateral pedicle graft.

Miller^[6] in 1985 presented a surgical technique combining the frenectomy with a laterally positioned pedicle graft. Esthetically acceptable attached gingiva across the midline was attained by laterally positioned gingiva and healing by primary intention. No attempt was made to dissect the transeptal fibres and hence, interdental papilla remained undisturbed. Esthetically and functionally better results were obtained. So, in the following case-series this technique has been attempted and results are presented.

CASE-SERIES

The present surgical technique was undertaken at Rajah Muthiah Dental College and Hospital, Tamil Nadu. The subjects underwent frenectomy for functional, aesthetic, periodontal or orthodontic reasons. A frenum was judged abnormal if it was unusually broad and there was no apparent attached gingiva in the midline and the interdental papilla could be stretched by the frenum.

CASE REPORT

Case 1

A 16-year-old female patient was referred from Department of

Orthodontics for frenectomy. On clinical examination, a gingival upper mid frenum was found [Figure 1a]. After local anesthesia, a horizontal incision was taken to separate the frenum from the base of interdental papilla. This incision was extended apically up to the vestibular depth to completely separate the frenum from alveolar mucosa. Any remnant of frenal tissue in the mid line and on the under surface of lip was excised [Figure 1b]. A vertical parallel incision was taken on the mesial side of lateral incisor, 2-3 mm apical to marginal gingiva, up to vestibular depth. The gingiva and alveolar mucosa in between these two incisions were undermined by partial dissection to raise the flap [Figure 1c]. A horizontal incision was then given 1-2 mm apical to gingival sulcus in the attached gingiva connecting the coronal ends of the two vertical incisions. Flap was raised, mobilized mesially, and sutured to obtain primary closure across the midline [Figure 1d]. No attempt was made to dissect trans-septal fibers between approximating central incisors. Gingivoplasty of any excess labial and/or palatal tissue in the interdental area was done, preserving the integrity of the interdental papilla. The surgical area was dressed with Zinc- oxide eugenol pack. Dressing and the sutures were removed one week later [Figure 1f]. A healing zone of attached gingiva was clearly visible with no loss of interdental papilla [Figure 1g].

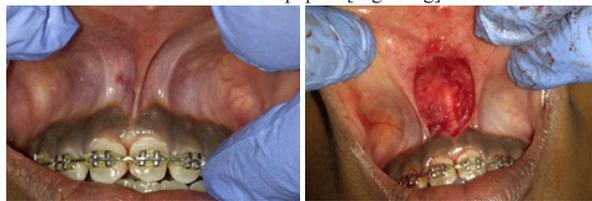


Figure 1a- Preoperative view Figure 1b- Resected frenum site



Figure 1c- Vertical incision mesial to lateral incisor and undermining the pedicle Figure 1d- Displaced and suturing of the pedicle



Figure 1e- Periodontal dressing given Figure 1f- 1 week- Postoperative view



Figure 1g- 1 month- Postoperative view

Case 2

A 18 year old male patient was referred from Department of Orthodontics for frenectomy. On examination there was papillary penetrating frenum attachment (Figure 2a). The case was treated surgically by lateral pedicle graft method (Figure 2b-2e). One month post-operative view is shown in (Figure 2f)



Figure 2a- Preoperative view Figure 2b- Resected frenum site



Figure 2c- Vertical incision mesial to lateral incisor and undermining the pedicle Figure 2d- Displaced and suturing of the pedicle



Figure 2e- Periodontal dressing Figure 2f- 1 month-Postoperative view

RESULTS

The outcome of this surgical procedure shows this technique produced a pleasing aesthetic result. Scar formation in the midline could be avoided. On healing, a wider zone of attached gingiva was obtained. It was color matched with adjacent tissue. Healing was obtained by primary intention. No loss of interdental papilla was observed. No complication was noted during healing period. Patient's compliance was also very good. Case 2 was associated with papillary penetrating frenum attachment. This technique was limited in processing lateral pedicle graft because of anatomical constrains. Hence an attempt was made to closure the defect to the extent of soft tissue available and leaving the apical area of wound to heal by secondary intention.

DISCUSSION:

The concept of management of abnormal frenal attachment started from Classical frenectomy technique by Archer^[7] to modern concepts by Edwards. To evade the formation of scar and to facilitate healing, application of laser and soft tissue grafts helped in evolving the newer frenectomy procedures.

Nirwal Anubh et al^[12] performed frenectomy using laterally displaced pedicle graft achieved esthetically pleasing result without scar formation in the midline and there was no loss of interdental papilla. In the case of our patient too we could achieve the same with good colour match.

Krishna Chaubey et al^[13] also evaluated the frenectomy procedure using lateral pedicle graft also showed the same result with a scar free esthetic zone without loss of interdental papilla was similar to our present study.

Ameet Mani et al^[14] and Devishree et al^[15] in their studies using lateral pedicle frenectomy also observed that healing by primary intention did not cause scarring after healing in the midline.

Hungund S et al^[16] in his study compared the classic frenectomy procedure with unilateral and bilateral displaced flap and concluded that the classic frenectomy failed to provide pleasing esthetic result whereas laterally displaced pedicle flap achieved the same with no scar formation and without loss of interdental papilla .

In Miller's technique during healing, there is a continuous band of gingiva across the midline rather than unaesthetic scar and transeptal fibers are not disrupted surgically. This avoids trauma to interdental papilla. But Miller suggested that frenectomy with laterally positioned

pedicle flap was to be performed after the closure of the diastema^[6].

CONCLUSION:

The present case report combining frenectomy with a lateral pedicle graft has certain distinct advantages.

1. Healing takes place by primary intention.
2. A zone of attached gingiva, matching with adjacent tissue, forms in midline which is pleasing to the individual.
3. No unesthetic scar formation.
4. No recession of interdental papilla occurs because the transseptal fibres are not severed out.

Hence the above technique can be used as an effective means to eliminate the pathological frenum and also maintain an esthetic outcome.

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