



Perio-Esthetics: Frenectomy With Lateral Pedicle Graft

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ABSTRACT

Smile is an expression that exhibits a feeling of joy, success, sensuality, affection, and reveals self-confidence and kindness. The harmony of the smile is determined not only by the shape, the position, and the color of the teeth, but also by the gingival tissues. In case the gingival tissues do not exhibit harmony with that of smile the individual loses self-confidence. The maintenance of esthetics in the anterior zone is important and especially if the patient is female the importance increases. The present case report, highlights the importance of perio-esthetics in maintaining the harmony of the gingival tissues.

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Introduction

A frenum is an anatomic structure formed by a fold of mucous membrane which is triangular in shape and attaches the lip to the alveolar mucosa, gingiva and underlying periosteum. Their primary function is to provide stability of the upper and lower lip and the tongue.¹

Great controversy and confusion existed in initial days about its makeup. *Knox* and *Young*² histologically studied the frenulum, and they found both elastic and muscle fibres³ in their sections. The entire controversy was laid to rest by *Henry et al*³ who studied thoroughly the histological constituents of frenum and found considerably dense collagenous tissue, loose connective tissue, and elastic fibers, but no muscle fibers.

Based on the extension of attachment of fibers, frena have been classified as:⁴

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

Apart from these variations may appear in the appearance of frena which include:⁵

- Simple frenum with a nodule
- Simple frenum with appendix
- Simple frenum with nichum
- Bifid labial frenum
- Persistent tectolabial frenum
- Double frenum
- Wider frenum

A frenulum was judged "abnormal" if the frenulum was unusually broad, and there was no apparent attached gingiva in the midline and the interdental papilla could be moved by stretching the frenulum.

An abnormal upper labial frenum is capable of retracting the gingival margin, creating a diastema, limiting lip

movement, and in cases of a high smile line, affecting esthetics also. The frena may also jeopardize the gingival health by causing a gingival recession when they are attached too closely to the gingival margin, either because of an interference with the proper placement of a toothbrush or through the opening of the gingival crevice because of a muscle pull. Frenal attachment that encroach on the marginal gingiva distend the gingival sulcus, fostering plaque accumulation, increasing the rate of progression of periodontal recession and thereby leading to recurrence after treatment.

When an abnormal frenum is present, frenectomy is advised. In classic frenectomy by *Archer and Kruger*, the frenulum, interdental tissue and palatine papilla are completely excised. This approach was advocated to assure removal of muscle fibers supposedly connecting the orbicularis oris with the palatine papilla.

Often the loss of the interdental papilla between the maxillary incisors during the classic frenectomy creates an unacceptable esthetic result. To overcome this drawback, this technique has been modified in many ways. But in most of the techniques the zone of attached gingiva and esthetics are not considered. This case report highlights a new technique of frenectomy that results in good esthetics, excellent colour match, gain in attached gingiva, and healing by primary intention at the site of the thick, extensive abnormal frenum.

Case Report

A 12-year-old patient reported to the Department of Periodontics and Implantology, Kothiwal Dental College and Research Centre, Moradabad with the chief complaint of bleeding from gums in the upper front tooth region. Patient's medical history did not reveal any systemic diseases. Intra-oral examination revealed presence of high frenal attachment and midline spacing between maxillary central incisors. There was inflammation in upper anterior tooth.

A heavy band of tissue with a broad, fanlike base was attached to the palatine papillae (Figure 1). After obtaining informed written consent from the parents, decision was made to remove high frenal attachment by a surgical technique.



Figure 1

After local anesthesia, a vertical 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 2). A vertical parallel incision was taken on the mesial side of lateral incisor, 2-3 mm apical to marginal gingiva, up to vestibular depth (Figure 3). The gingiva and alveolar mucosa in between these two incisions were undermined by partial dissection to raise the flap (Figure 4).



Figure 2

Figure 3

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 (Figure 5,6).



Figure 4



Figure 5



Figure 6

Flap was raised, mobilized mesially, rotated so that the distal end of the flap was at the tip of interdental papilla and sutured to obtain primary closure across the midline (Figure 7,8).

The surgical area was dressed with COE PAK™ (GC America Inc., Alsip, IL, 60803, U.S.A.). Dressing and the sutures were removed ten days later (Figure 9).



Figure 7



Figure 8



Figure 9



Figure 10

Result

Healing was obtained by primary intention. Two weeks post-operative view shows a healing zone of attached gingiva in midline with no loss of interdental papilla (Figure 9). The zone of attached gingiva was increased and the colour was comparable to the adjacent tissue. The healing was uneventful even at eight months follow-up (Figure 10).

Discussion

One of the more interesting yet often misunderstood anatomic structures in the oral cavity is the frenum- a mucosal attachment of a loose part to a more rigid part.

Miller has recommended that the frenum should be characterized 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.

The low attachment of fleshy maxillary labial frenum has the following characteristics:-

1. A frenum, which is unsightly, being visible as a pendulous tissue in the midline of the upper lip.
2. Its presence precludes maintenance of good oral hygiene.
3. Where there is a direct attachment of the frenum at the gingival margin, it might increase the rate of periodontal destruction in the presence of pre-existing periodontal disease. This was confirmed by positive indication of the blanching test.¹

In the present case, frenum attachment was pathogenic as it was hampering proper oral hygiene and was responsible for inflammation in the upper anterior region. Hence it was necessary to perform a frenectomy for functional reasons to remove the interference.

There are numerous surgical techniques for the removal of labial frenum. Since the conventional procedure of frenectomy was first proposed, a number of modifications of the various surgical techniques like the Miller's technique, V-Y plasty and Z-plasty have been developed to solve the problems which are caused by an abnormal labial frenum. Coletton and Lawrence have used free gingival graft combined with frenectomy. Laser has been used by various clinicians which has its relative advantages and disadvantages.⁵

In the era of periodontal plastic surgery, more conservative and precise techniques are being adopted to create more functional and aesthetic results. In this context, Miller's technique combined with a laterally positioned pedicle graft was attempted in this case.

This technique offers two distinct advantages. First, on healing, there is a continuous band of gingiva across the midline rather than unesthetic scar. The second advantage is that trans-septal fibers are not disrupted surgically to avoid any trauma to interdental papilla. This prevents loss of interdental papilla. The purpose of elevating a partial thickness of gingival tissue for lateral displacement is to achieve a healing with primary union that heals rapidly with minimal edema, no local infection or serous discharge, no separation of wound edges, and no scar formation. The end result of the surgery as seen in the post-operative follow-up validates selection of the surgical technique. There was wide zone of attached gingiva in the midline apical to the papilla with excellent colour match with neighboring tissues. This simple

procedure resolved the initial problem where patient can maintain right oral hygiene with superb esthetics.

Another important clinical finding in the present case was the presence of diastema between the central incisors. There are number of etiological factor responsible for this condition but in the present scenario the low frenum attachment was the culprit. Generally abnormal frenal attachment is removed either before orthodontic treatment or at the end of active treatment. If the surgery is performed before the orthodontic procedure, the scar tissue might impede the closure of diastema. This situation was avoided by the selection of the right surgical technique. Moreover we went ahead with the elimination of the frenum in spite others clamming that diastema closure was prerequisite before frenectomy was attempted. This is because there is going to be mesial migration during active stage of canine eruption. Thus in our case, an attempt was made to remove the aetiology, even though the patient was only 12 years old, considering the fact that there will be maximum active mesial movement of tooth during eruption and permanent canine had yet to erupt.

Conclusion

Correct evaluation of the situation, selection of the appropriate technique for its resolution not only helped in dealing with the problem but created an environment where nature can also play an active role in further improving the condition.

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