Frenectomy with laterally displaced flap: a Case Report

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Abstract

An aberrant frenum gives rise to aesthetic and functional problems and needs to be eliminated. Various procedures were introduced to eliminate the aberrant frenum which led to delayed healing, loss of interdental papilla and unesthetic scar. This led to more conservative approaches with their technical and esthetic limitations. An alternative approach for primary closure in midline and to avoid unesthetic scar by creating a zone of attached gingival is frenectomy with laterally displaced flap. The interdental papilla is left surgically undisturbed and healing takes place by primary intention. A case report of frenectomy with laterally displaced flap is presented.

Key words: aberrant frenum, frenectomy, laterally displaced flap

Introduction

A frenum is an anatomic structure formed by a membranous 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. This attachment generally changes as the alveolar process grows to assume the adult configuration1. Taylor has observed that a midline diastema is normal in about 98% children between 6 and 7 years of age but the incidence decreases to only 7 % in persons 12-18 yrs old2. But in some instances the infantile arrangement is retained. Depending upon the extension of attachment of fibres, frena have been classified 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 frena are considered as pathological and have been found to be associated with loss of papilla, recession, diastema, difficulty in brushing, alignment of teeth4. 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. In such cases, it is necessary to perform a frenectomy for esthetic, psychological and functional reasons. Aberrant frena are detected visually, by applying tension to see the movement of papillary tip or blanch produced due to ischemia of the region. There are numerous surgical techniques for the removal of labial frenum. In the “classical frenectomy” by Archer and Kruger 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. Henry et al. in his study of histological constituents of frenum found dense collagenous tissue, loose connective tissue and elastic fibres but no muscle fibres. So Edward, 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 and Lawrence have used free gingival graft combined with frenectomy. This procedure avoids the scar and increases the attached gingival in midline, but a mismatched gingival colour in midline and need of a second surgical site to achieve donor tissue complicated the technique. Laser has been used by various clinicians which has its relative advantages and disadvantages.

Miller 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 transseptal fibres and hence, interdental papilla remained undisturbed. Esthetically and functionally better results were obtained. So, in the following case this technique has been attempted and post-operative results evaluated.

Surgical technique

A 30 year old male came to the department of periodontology with chief complaint of spacing between the front teeth. On clinical examination it was found that patient had a type III frenal attachment. The situation was explained to the patient and was advised to undergo a frenectomy procedure. After local anaesthesia, 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. A vertical parallel incision was taken on the mesial side of lateral incisor, 2-3mm 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. 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, mobilised mesially and sutured to obtain primary closure across the midline. The surgical area was dressed with COE PAK (GC America Inc., USA). Dressing and the sutures were removed 1 week later. A healing zone of attached gingiva was clearly visible with no loss of interdental papilla.
Results
The healing of the surgical procedure was uneventful. Scar formation in the midline could be avoided. On healing a wider zone of attached gingiva was obtained in the midline. It was colour matched with adjacent tissue. Healing was obtained by primary intention. No loss of interdental papilla was observed. No complication was noted during healing period.

Discussion
In the era of periodontal plastic surgery, more conservative and precise techniques are being adopted to create more functional and esthetic results. The technique for management of aberrant frenum has undergone changes from Archer's\textsuperscript{8} and Kruger's\textsuperscript{9} “classical techniques” of total frenectomy to Edward’s\textsuperscript{10} more conservative approach. Recent techniques added frenal relocation by Z-plasty\textsuperscript{15}, frenectomy with soft-tissue graft\textsuperscript{11, 12} and Laser\textsuperscript{13, 14} applications to avoid typical diamond shaped scar and facilitate healing. A frenum is evaluated in relation to vestibular depth, zone of attached gingiva, interdental papilla and diastema. A zone of attached gingiva is considered to prevent recession and it also gives an aesthetically pleasant appearance. Miller’s technique combined with a laterally positioned pedicle graft\textsuperscript{7} 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 fibres are not disrupted surgically, to avoid any trauma to interdental papilla. This prevents loss of interdental papilla. Miller, in his study observed that interdental papillae were maintained in all 27 cases surgically treated by this method.

Conclusions
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.

References