# Frenectomy: A literature review

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**ABSTRACT**

A frenum is a triangle shaped mucous membrane fold that attaches the lip and the cheek to the gingiva, the alveolar mucosa and the underlying periosteum. The gingival health may get compromised if the frenum is attached too closely to the gingival margin either due to muscle pull or due to hinderance in the plaque control. The maxillary frenum may present aesthetic problems or compromise the orthodontic result in the midline diastema cases, thus causing a recurrence after the treatment. Frenectomy is performed to manage such an aberrant frenum.

This article is a compilation of a concise overview related to frenum primarily focussing on the frenal attachments, their association with various syndromes, indications, contraindications, advantages and the disadvantages of various techniques of frenectomy such as Miller's technique, Z-plasty, V-Y plasty modified frenectomy technique, frenectomy by using electrocautery and LASERS.

**Keywords**: Frenum, frenal attachments, frenectomy, mucogingival techniques.

## INTRODUCTION

The soft and hard tissues of the oral cavity, not only helps in mastication but also helps in speech, aesthetics, swallowing and oral movement. Any abnormality in the attachment of tissues and muscles would lead to improper functioning and poor aesthetics. In recent times aesthetics concerns primarily with the purpose of achieving perfect smile have led to increase demand for dental treatment.

The presence of aberrant frenum may compromise the gingival health by causing a gingival recession. Midline diastema may be caused by maxillary frenum jeopardising the orthodontic result leading to aesthetic problems[1]. The aberrant frenum can either be treated by frenectomy or frenotomy.

## FRENUM AND ITS MUSCULAR ANATOMY

Derived from Latin word frenum - A frena are triangular shaped folds found in maxillary and mandibular alveolar mucosa, and are located between the central incisors, canine and premolar area. The maxillary labial frenum, the

mandibular labial frenum, and the lingual frenum are the most common one.

Histologically, Knox and Young have reported both muscle and elastic fibres (orbicularis oris- horizontal bands and oblique fibres) According to Henry, Levin and Tsakins frenulum consists of dense collagenous tissue and elastic fibres but no muscle fibres.

The size, shape and position of frenum are subjected to variations during different stages of growth and development. It tends to diminish in size with growth. Usually wide and thick in young children, becomes thinner and smaller with growth.

Function – Prime function is to provide stability of tongue, upper and lower lip.

## ATEIOLOGY OF HIGH FRENAL ATTACHMENT

The maxillary labial frenum develops as a post-eruptive remnant of the ectolabial bands which connect the tubercle of the upper lip to the palatine papilla. No bone is deposited inferior to the frenum when the two central incisors erupt widely separated resulting in V-shaped bony defect which leads to aberrant frenum attachment. The mandibular frenum is considered as abnormal when it is associated with a decreased vestibular depth and an inadequate width of the attached gingiva.

## CLASSIFICATION OF FRENAL ATTACHMENT

I-Depending on attachment level frena can be classified by Placek et al(1974):[5]

- Mucosal- here frenal fibres are attached upto the mucogingival junction.
- Gingival- here fibres are inserted within the attached gingiva.
- Papillary- the fibres extend into the interdental papilla.
- Papilla penetrating- the frenal fibres cross the alveolar process and extends up to the palatine papilla.

II-According to Sewerin (1976) frenal attachment can be classified as:[5]

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

III-Depending on morphology:

- Long and thin
- Short and broad

**Pathogenic Frenum:** The papilla and papillary penetrating frena are considered as pathological. This is found to be related with loss of papilla, diastema, recession, malaligned teeth and difficulty in brushing and improper denture fit.

If tension from the lip movement pulls the gingival margin away from the tooth, frenum can become significant.

Frenal attachment on encroaching the marginal gingiva can distend the gingival sulcus, fastening plaque accumulation which results in increasing the rate of progression of periodontal progression therefore leading to recurrence after treatment.

**Syndromes associated with frenal attachment:** Each syndrome shows distinct frenal abnormality which includes hypoplastic, hyperplastic or absence of frenum.

1. **Ehler-Danlos Syndrome:** Genetic disorder with hyper extensive skin and hyper mobile joints, no gender

prediliction. Inferior labial and lingual frenum is absent in this syndrome.

2. **Holoprosencephaly:** An autosomal dominant condition with brain malformation. Labial maxillary frenum is absent.[4]
3. **Infantile hypertrophic pyloric stenosis:** Mostly occurs in males. Absence of mandibular frenum helps as a diagnostic tool.
4. **Oro-facial Digital syndrome:** X-linked dominant inheritance which includes abnormal supernumerary frenula, malaligned teeth, enamel hypoplasia, hypertrophied lingual frenum which is incompletely differentiated from the floor of the mouth.
5. **Ellis-van Creveld Syndrome:** An autosomal recessive disorder which affects the ectodermal components such as enamel, nail and hair. Presence of abnormal supernumerary frena which extends from buccal mucosa to alveolar ridge helps as a diagnostic tool.

## DIAGNOSIS

Detected visually by applying tension over the frenum to see the movement of the papillary tip or blanching which is produced due to ischemia in the region. Characterized as pathogenic when it is unusually wide or when no apparent zone of the attached gingiva is present along the midline or the interdental papilla shifts when the frenum is extended.

## INDICATIONS FOR FRENAL REMOVAL

- Presence of midline diastema due to aberrant frenal attachment.
- Presence of gingival recession due to flattened papilla with frenum closely attached to gingival margin.
- Presence of inadequate attached gingiva due to aberrant frenum.
- When oral hygiene is hindered by shallow vestibule due to high frenal attachment.
- When speech is hindered due to lingual frenum.

## MANAGEMENT

There are two procedures by which abnormal frenal attachment can be managed.

1. FRENECTOMY
2. FRENOTOMY

Frenectomy is the procedure of complete removal of frenum including its attachment to the underlying bone.

Frenotomy is the procedure of incision and relocation of the frenal attachment.

Frenectomy and frenotomy are usually done along with other periodontal procedures but at times are done as separate procedures.

The labial surface between maxillary and mandibular central incisors, canine and premolar areas are most often affected. Lingual surface of the mandible are less affected.

Frenectomy can either be achieved by routine scalpel technique, electro surgery or lasers.

Electrocautery probe can also be used due to its efficacy and safety, mild bleeding and absence of postoperative complications.[6] Risk of burns, explosion, if combustible gases are used is some of the complications which can be avoided by using Argon Beam Coagulation.

Along with the conventional technique of frenectomy there are modifications of various tecniques available for the management of frenectomy.

Various methods used for frenectomy are:

1. **Conventional (classical) frenectomy-** This technique was invented by Archer (1961) and Kruger (1974). It is an excision type of frenectomy which includes the interdental tissues along with palatine papilla and the frenulum. Indicated in midline diastema with an abnormal frenum. It is easy to perform but relapse rate is high.[8]
2. **Miller's technique-** This was introduced by Miller PD in 1985. Usually performed in post orthodontic diastema cases. Care must be taken to perform surgery once the orthodontic movement is complete. Requires minimum surgical intervention and aesthetically better to perform.[10]
3. **V-Y Plasty-** Used for lengthening the localised area especially broad frenum area like premolar-molar area. Indicated in papilla type of frenal attachment. Unsatisfactory aesthetics results in case of thick papilla.
4. **Z Plasty-** This method is used in case of hypertrophied frenum with low insertion and also in case of short vestibule. Using this method, removal of fibrous band as well as vertical lengthening of the vestibule is achieved.[9]
5. **Modified frenectomy technique by Bagga et al, 2006-** Indicated in wide thick and hypertrophied frenum where primary concern is aesthetics. It provides gain in attached gingiva, excellent color match, healing by primary intention with minimal scar formation.[7]
6. **Frenectomy by electrocautery-** Preferred in cases with bleeding disorder, suturing is not requied. Care must be taken around implants.

## DICUSSIONS

The classical technique is still the most widely followed procedure inspite of many modifications available. But it leaves scarring resulting in unaesthetic appearances.

The electrocautery procedure has the advantage of bloodless field during surgery with no requirement of sutures. V-rhomboplasty fails to provide good aesthetics results in case of broad thick hypertrophied frenum due to secondary intention healing. Miller's technique is best suited to prevent orthodontic relapse. The Z-plasty technique is ideal for thick hypertrophied frenum with low insertion.

## CONCLUSION

Based on the type of frenal attachment, a functional and an aesthetic outcome can be achieved by proper selection of method. A frenum not interfering with a patient's aesthetics or causing any functional concerns do not warrant any surgical intervention. However, if the tension test is positive and the pocket is deflected due to high frenal pull then any of the methods for surgical intervention according to clinical indication can be undertaken.

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