

Frenal Attachments: An Overview

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Abstract:- The fenum, a slender fold of mucous membrane with contained muscle fibres, connects the lips to the alveolar mucosa and underlying periosteum. The frenum, a mucosal connection that joins a flexible section to a more stiff part, is one of the more fascinating yet sometimes misunderstood anatomical structures in the oral cavity. When the frenum are attached too closely to the gingival margin, either because of difficulty with plaque control or because a muscle pulls, the health of the gingiva may be at risk. Unaesthetic diastema is more common and can be caused by abnormal frenum, which can also be a sign of a syndrome or create serious mucogingival issues. In the following, we will provide a brief summary of the many varieties of frenum, as well as how they relate to different syndromes, indications, complications, and benefits.

Keywords- Aberrant frena; frenal attachments; frenectomy; syndromes

I. INTRODUCTION

The lingual frenum, mandibular labial frenum, and maxillary labial frenum are the three most prominent frenum in the oral cavity. They provide the main purpose of stabilising the tongue, upper and lower lips[1]. The alveolar mucosa and underlying periosteum are attached at the lips by labial frenal attachments, which are small folds of mucous membrane with encased muscle fibres that originate from the orbicularis oris muscle of the upper lip[2]. When the frenum is excessively closely linked to the gingival margin, it can lead to diastema, gingival recession, bone loss from the muscle strain, and impaired lip mobility, especially when speaking and smiling[3].

II. CLASSIFICATION

A. *Mirko et al(1974)'s classification of frenal attachments* [4].

Papilla penetrating – frenal fibers penetrate the papilla and stretch upto the palatine papilla [figure 1]



Fig. 1 courtesy - [16]

Mucosal – Upto mucogingival junction, frenal fibers are attached [figure 2]



Fig. 2 courtesy – [16]

Papillary – fibers are spreading into the interdental papilla [figure 3]



Fig. 3 courtesy – [16]

Gingival – fibers extend and are inserted within attached gingiva[figure 4]



Fig. 4 courtesy – [16]

B. Sewerin's classification of frenal attachments (1971) [5].

1. Regular frenum
2. A nodule in a typical frenum
3. Regular frenum with appendix
4. Regular frenum with notch
5. Bilateral labial frenum
6. Persistent tectolabial frenum
7. Double frenum
8. Wider frenum

III. DIAGNOSIS

By exerting stress across the frenum and looking for movement of the papillary tip or a blanch caused by local ischemia, the aberrant frena are clinically identified.

Miller et al. (1985): When the frenum is abnormally wide, when there is no discernible zone of the associated gingiva along the midline, or when the interdental papilla changes when the frenum is expanded, the frenum is classified as pathogenic.

IV. SYNDROMES

The variation in frenal attachment, or any abnormality may be seen in a variety of disorders, that may include -[6].

- Oro-facial-digital syndrome
- Ellis van creveld syndrome
- Ehler's danlos syndrome
- Infantile hypertrophic pyloric stenosis
- Holoprosencephaly

A. Oro-facial-digital syndrome

- It results from a single gene abnormality with X-linked dominant inheritance[7].
- The lingual frenum is hypertrophied and incompletely differentiated from the floor of the mouth. The tongue is lobulated with hamartomata between lobules[8].

B. Infantile hypertrophic pyloric stenosis

- Usually found in males, unclear cause.
- Mandibular frenum hypoplasia or absence serves as a key diagnostic indicator for this illness[9].

C. Holoprosencephaly

- It is an autosomal dominant disorder defined by a brain malformation brought on by prosencephalon abnormalities
- .Absence of labial maxillary frenum is one of the characteristic features of this condition[10].

D. Ellis-van Creveld (EvC) syndrome

- It is an autosomal recessive disorder, mainly affecting the ectodermal components.
- The anterior portion of the lower ridge is often serrated and presents with multiple small labial frenula.
- The maxillary and mandibular alveolar process presents with notching or submucous clefts and continuous or broad labial frenula with dystrophic philtrum[11].

E. Ehler-danlos syndrome

- It is characterized by hyper extensive skin and hyper mobile joints with no gender predilection.
- Absence of the inferior labial and lingual frena has been described [12].

V. COMPLICATIONS [13]

- When the frenum is excessively closely linked to the gingival margin, it can lead to diastema, gingival recession, bone loss from the muscular strain, and impaired lip mobility, especially when speaking and smiling[14].
- Papilla loss
- Midline diastema and gingival recession
- Since the basic function of the frenum is to maintain stability between the growing bones and musculature of the lip, the presence of an aberrant frenal attachment can modify the movement of these structures and may have an impact on the position of the jaws and arrangement of the dentition.
- Difficulty in maintaining oral hygiene.
- Malaligned teeth.
- Compromised denture fit or retention.

VI. MANAGEMENT TECHNIQUES [15].

A. Classical Frenectomy

- Archer and Kruger first described classical frenectomy in 1961 and 1964, respectively.
- Used in treating high frenal attachments such as in interdental papillae.
- In this procedure, the surgical site is anesthetized with 2 % Lignocaine with 1:80,000 adrenaline.
- An incision is made on the frenal site down the underlying bone i.e., periosteum.
- The frenum and the interdental tissue are entirely detached from the periosteum and surgically removed.
- Advantage - Easy to perform.
- Disadvantages - Scar tissue formation, loss of papilla, high relapse rate.

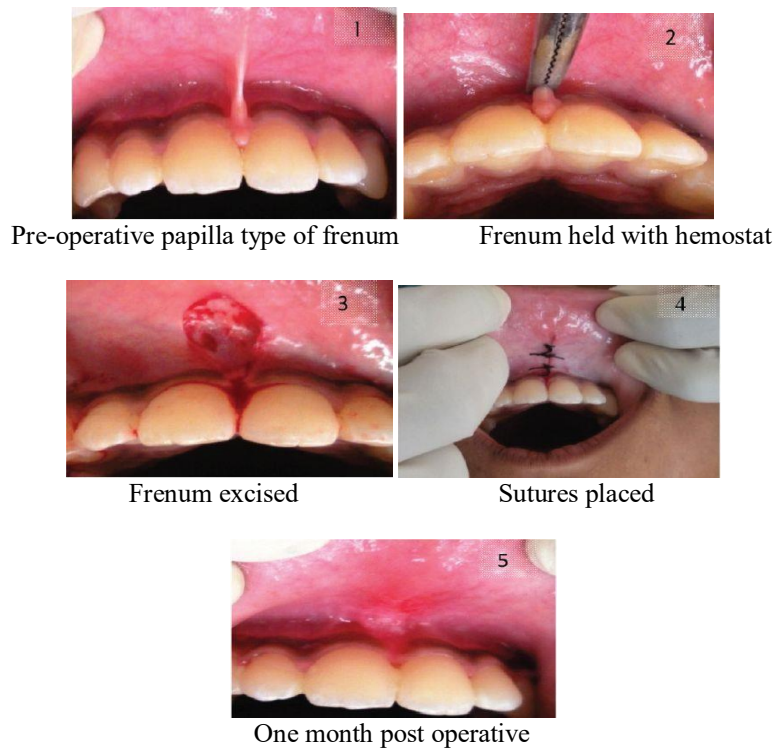


Fig. 5 courtesy-[17]

B. Miller's Technique:[15].

- Miller PD described this technique in 1985, where he combined frenectomy with laterally displaced flap.
- It is commonly performed in individuals with orthodontic relapse. After complete tooth movement, six weeks before removing appliance, this technique is used.
- An incision is made on the frenum apically and its separated from the interdental gingiva.
- The frenum is removed completely from the gingiva and lips, an vertical parallel incision was made.
- The gingiva and alveolar mucosa between these two

incisions were undermined by partial dissection to raise the flap which is mobilised mesially and sutured to obtain primary closure across the midline and the surgical area is sutured.

- The dressings are removed after one week.
- Advantages-
- It is aesthetic with minimum of surgical intervention.
- No scar tissue formation and no loss of the interdental papilla.
- Orthodontic stability and healing by primary intention.

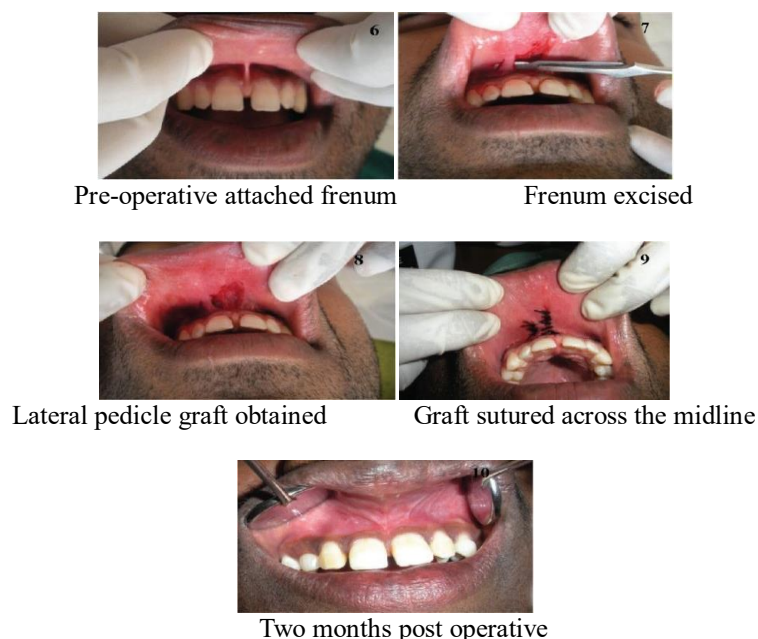


Fig. 6 courtesy- [17]

C. Z-Plasty

- When the frenum attaches very deeply into the gingiva and creates a midline diastema, it is used.
- For the purpose of removing the frenum and closing the suture site, a Z-shaped incision (two cuts) is made.

- Advantages:
- Scarring is minimised because it encourages the re-distribution of strain on the skin and the wound and aids in skin-line healing.
- Enhanced aesthetics

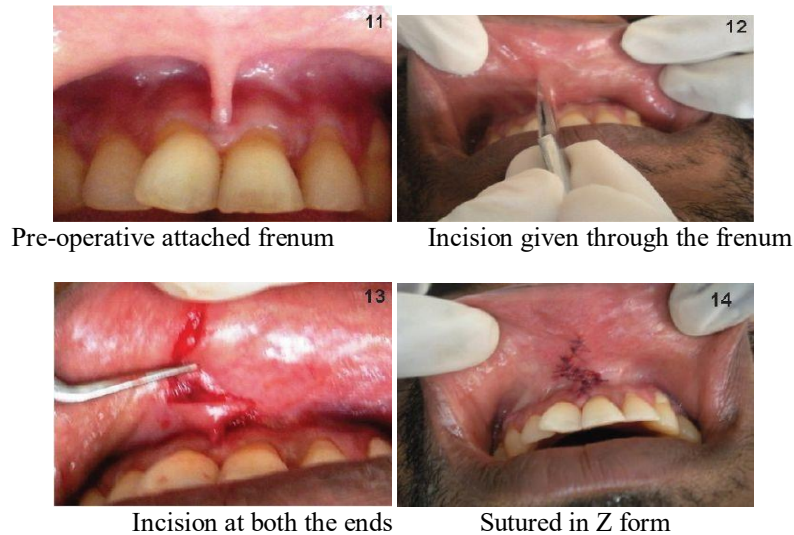


Fig. 7 courtesy-[17]

D. V-Y Plasty

- It is used to correct the papillary type of frenal attachment.
- V and Y-shaped incisions are made under the surface of the frenum, then it is detached from the interdental gingiva and repositioned.
- The frenum is relocated more apically and the V shaped

incision is converted into a Y, and it is sutured with 4-0 silk sutures. Cover the area with periodontal dress to keep it dry.

- Disadvantage-It fails to provide satisfactory aesthetic results in case of a thick hypertrophied frenum.

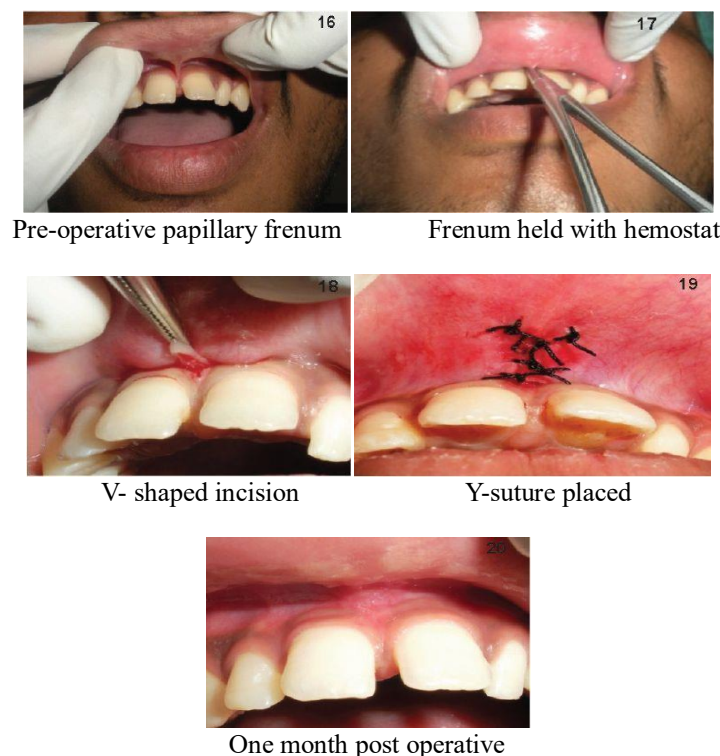


Fig. 8 courtesy [17]

E. Electrosurgery

- An electrode delivering electric heat is used here.
- Advantages- minor bleeding , quick healing, and suturing

not required

- Curved electrodes aid visibility and thus they are efficient and effective for soft tissue removal.



Pre-operative attached type frenum Excised with loop electrode No suture required

Fig. 9 courtesy [17]

F. Laser Treatment

- A coherent, tightly concentrated beam of photons is a laser.
- The process causes localised heat there.
- Lasers are primarily used to cut, ablate, evaporate, and coagulate soft tissues.
- The frenum is often entirely removed using argon and carbon dioxide lasers.
- The following are benefits of using a laser over a cold scalpel: Bloodless field (using the CO₂ laser),
- Sutures are not necessary because second-intention healing takes place.
- Postoperative discomfort and swelling might occasionally be absent or less severe.

VII. POST OPERATIVE INSTRUCTIONS

- After the procedure of frenectomy patient is asked to not to stretch or not to pull down the lip or cheek.
- Patient is advised not to eat anything until the anesthesia wears off.
- To avoid extremely hot foods on the day of procedure.
- Rinsing of the mouth is not appreciable,
- Often it leads to prolong bleeding, or bleeding continues to which light pressure to be applied with moistened gauze on the particular area for minimum 20-30 min.
- Alcohol ,smoking should be avoided.
- To maintain good oral hygiene in areas of the sutures.
- Analgesics and chlorhexidine mouthwash are advised.
- Sutures are removed after 7 days, after the procedure

VIII. CONCLUSION

Frenum might not always draw closer to the skull during a standard dental examination, but the presence of aberrant frenum could be a sign of a number of syndromic and non-syndromic diseases. However, any of the modification procedures that have been suggested can be used to eliminate aberrant frenum, and by choosing the right approach, a functional and attractive result can be obtained.

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