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An overview of frenectomy: A review

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Abstract

The frenum is a mucous membrane fold that attaches the lip and the cheek to the alveolar mucosa, the gingiva, and the underlying Periosteum. Abnormal frenum attachment may lead to difficulty in speech, mastication as well as esthetic issues. It may jeopardize the gingival health either due to an interference in the plaque control or due to a muscle pull. The management of such an aberrant frenum is accomplished by performing a frenectomy. The present article is a compilation of a brief overview about the frenum, with a focus on the etiology, indications, contraindications, advantages and the disadvantages of various frenectomy techniques.

Keywords: Aberrant Frenum, Frenectomy, Aesthetic

Introduction

Aesthetic concerns have led to an increasing importance in seeking dental treatment, with the purpose of achieving perfect smile. The presence of an aberrant frenum being one of the aetiological factors for the persistence of a midline diastema, the focus on the frenum has become essential [1]. An abnormal labial frenum can lead to midline diastema, relapse of orthodontic treatment, gingival recession, Interference with retention of denture and compromised gingival health because of poor plaque control [2, 3]. It has been seen that an abnormal frenum can be an indicator of a syndrome such as Ehlers-Danlos syndrome, Infantile hypertrophic pyloric stenosis, Holoprosencephaly, Ellis-van Creveld syndrome and Oro-facial-digital syndrome. This paper highlight the classification of frenum attachment as well as diagnosis, indication, contraindication and treatment of aberrant frenum attachment by various techniques.

Etiology

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. When the two central incisors erupt widely separated, no bone is deposited inferior to the frenum. A V-shaped bony cleft between the two central incisors and an abnormal frenum attachment results. The mandibular frenum is considered as aberrant when it is associated with a decreased vestibular depth and an inadequate width of the attached gingiva [2, 3].

Classification

Literature review reflects that maxillary labial frenum has diverse morphology and clinical implications.

1. Sewerin Classification [4] (Based on morphotypes)
2. Placek Classification [5] (On the attachment location)

Sewerin Classification (1971)

This classification is based on the morphotypes.

- Simple frenum
- Persistent labial frenum
- Simple frenum with an appendix
- Simple frenum with a nodule
- Double frenum
- Frenum with niche
- Bifid frenum
- Frenum with two or more variations at the same time.

Placek Classification

The labial frenal attachments have been classified as mucosal, gingival, papillary and papilla penetrating, by Placek M *et al* (1974).This classification is based on the attachment location.

1. **Mucosal:** When the frenal fibres are attached up to the mucogingival junction.
2. **Gingival:** When the fibres are inserted within the attached gingiva.
3. **Papillary:** When the fibres are extending into the interdental papilla.
4. **Papilla Penetrating:** when the frenal fibres cross the alveolar process and extend up to the palatine papilla.

Diagnosis of Aberrantfrenum

Tesion Test/Blanch Test

Abnormal Frenal attachments are detected visually, by applying tension over it to see the movement of papillary tip or blanching produced due to ischemia of the region. Clinically papillary and papilla penetrating frenum are considered as pathological. A frenum can become a significant problem if tension from lip movement pulls the gingival margin away from the tooth, or if the tissue inhibits the closure of a diastema during orthodontic treatment [6].

The management of such aberrant frenum can be treated by Frenotomy or Frenectomy Procedure.

Frenotomy: is the incision and the relocation of the frenal attachment.
Frenectomy: is complete removal of the frenum including its attachment to the underlying bone and may be required for correction of abnormal diastema between the maxillary central incisors – (Friedman 1957)

Indications of Frenectomy
- To eliminate tension on the gingival margin
- To eliminate a frenum that penetrates the gingival Papilla.
- To facilitate orthodontic treatment.
- To eliminate a frenum that makes it difficult or impossible to use a toothbrush effectively in the area.
- To control recession of facial gingiva.

Contraindication of Frenectomy
In Ugly Duckly Stage, the space can be a normal growth characteristic during the primary and mixed dentition and generally is closed by the time the maxillary canines erupt. In young children, the frenum is generally wide and thick, becoming thinner and smaller during growth. In that case frenectomy is contraindicated.

Treatment Modalities Used For Frenectomy
Three most commonly used method for frenectomy are following

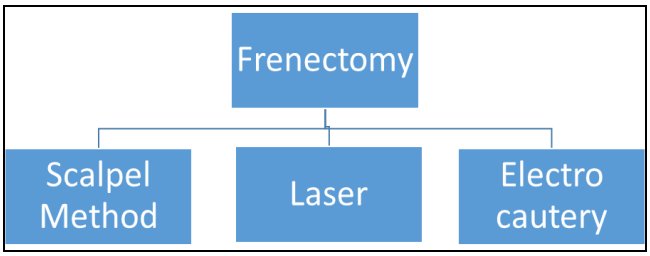

Fig 1

The conventional technique involves excision of the frenum by using a scalpel. However, each of the techniques differ from the following perspectives: anesthetic requirements, cutting characteristics, hemostasis, healing time, undesirable effects and cost involved [7]. The advantages of scalpel method is user friendliness, cost effectiveness, precision, control, conservation of tissue integrity and superior associated wound healing [8]. But the disadvantages of the scalpel include greater requirement of anaesthesia, necessity of suturing, poor hemostasis, adverse post-operative sequelae such as pain, swelling and discomfort [9].
Electrosurgery has been used since 1928 in dentistry for a variety of soft tissue procedures. Their coagulative effect ensures a bloodless area and clear view of the operative field. However, disadvantage of the electrosurgery it may lead to delayed healing and increase the risk of wound dehiscence [10].
Lasers are rapidly replacing the traditional treatment modalities due to their advantages of improved precision and visualization, minimal or no bleeding, reduced patient discomfort, shorter healing time and no unfavourable post-operative sequelae [11]

Different Techniques used for frenectomy

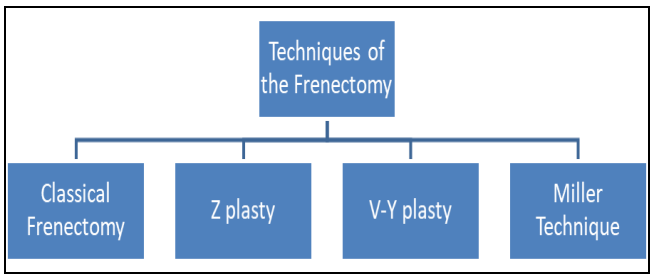

Fig 2

Conventional/Classical Method: The classical technique was introduced by Archer [11] (1961) and Kruger [12] (1964). This technique is an excision type frenectomy which includes the interdental tissues and the palatine papilla along with the frenulum.

Indications
This technique is performed in midline diastema cases with an aberrant frenum to ensure the removal of the muscle fibres which were supposedly connecting the orbicularis oris with the palatine papilla [3].
Technique: The lip is extended and the frenum was engaged with a haemostat to the depth of the vestibule. Incisions are placed on the upper and the under surface of the haemostat, triangular frenum tissue is removed. Underlying fibrous attachment to the bone is exposed. Horizontal incision is given onto these fibers separating and dissecting from the bone and the margins of the wound are gently undermined and re-approximated [1].
Advantages- Easy to perform.
Disadvantages- Scar tissue formation, loss of papilla and high relapse rate.

Z plasty
Indication: This technique is indicated when there is hypertrophy of the frenum with a low insertion, which is associated with an interincisor or diastema and when the lateral incisors have appeared without causing the diastema to disappear and also in cases of a short vestibule.
Technique: After excision of the fibrous tissue, two oblique incisions are made in a Z fashion, one at each end of the previous area ofexcision. Two pointed flaps are then gently undermined and rotated to close the initial vertical incision horizontally.
Advantage: This technique provides advantages, such as gain in attached gingiva in the region previously covered by the frenum, excellent color match, healing by primary intention, minimal scar formation and prevention of coronal reformation.

V-Y Plasty
Indication: V-Y plasty can be used for lengthening the localized area, like the broad frenum in the premolar-molar area.
In this technique, frenum is engaged with a hemostat and an incision is made in the form of V on the under-surface of the frenal attachment. The frenum is relocated at an apical position and the V shaped incision is converted into a Y while it is sutured. But disadvantage of this technique is it fails to provide satisfactory aesthetic results in case of a thick hypertrophied frenum [1].

Miller Technique

The Miller's technique was advocated by Miller PD in 1985 [14].

Indication

This technique was proposed for the post-orthodontic diastema cases. In this technique, frenectomy combined with a laterally positioned pedicle graft-functional and esthetic considerations The ideal time for performing this surgery is after the orthodontic movement is complete and about 6 weeks before the appliances are removed [1, 15].

Advantage of this technique is, it provide an orthodontic stability without an aesthetic sacrifice. In this technique, Healing takes place by primary intention and the transseptal fibres are not disrupted surgically and so, there is no loss of the interdental papilla [16, 17, 18].

Conclusion: The detection of aberrant frenum may act as a indicator in the diagnosis of a wide array of syndromic and non-syndromic conditions. Abnormal frenal attachments either in the size or location of frenum may lead to the development and persistence of midline diastema, gingiva recession and speech problems. Such conditions require complete excision of the frenum attachment to the underlying alveolar process.An aberrant frenum can be removed anyone of the proposed technique of frenotomy and frenectomy in literature. A functional and an aesthetic outcome can be achieved by a proper technique selection, based on the type of the frenal attachment.

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