

Management of an Aberrant Mandibular Labial Frenum By V-Rhomboidoplasty - A Case Report

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Abstract

Background: The frenum is an essential anatomical landmark of the mouth attaching the lip and the cheek to the alveolar mucosa, gingiva and thereafter the underlying periosteum. Aberrational frenal attachments or an abnormality occasionally leads to an interference in plaque control or excessive muscle pull thereby compromising gingival and periodontal health. Additionally an abnormal frenum attachment is also associated with aesthetic and functional issues, such as a midline diastema, localized gingival recession and other mucogingival deformities. Hence an intervention for correction of such an aberrant frenum is important. Methods: The management of aberrant frenum has been done using the v-rhomboidoplasty technique using a 15c blade after anaesthetizing the region. Conclusion: In the present case report the sequelae post procedure was uneventful with successful healing of the adjacent tissue.

Keywords: Aberrant, Mandibular frenectomy, V-rhomboidoplasty, periodontal plastic surgery.

Introduction

The frenum is defined as a band or fold of mucosal membrane which encloses the muscle fibres and attaches the lips and cheeks to the alveolar mucosa and/or gingiva and underlying periosteum and limits the movements of lips and cheeks [1,2]. The foremost frena are maxillary labial frenum, the mandibular labial frenum, and the lingual frenum [3] Their primary function being, to provide stability of the upper and lower lip and the tongue.[4]

A high labial frenum extends over the alveolar process in almost 85% of infants and forms a raphe that reaches the palatal papilla. As teeth erupt, this attachment assumes the adult configuration.[5] In some instances this infantile arrangement is retained and is associated with hypertrophy of the frenum.[6] **Placek et al(1974)** has

classified frenum depending upon the extension of attachment of fibres[7]

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

A modification of this classification was incorporated including a classification of anomalous freni alongside the classification of Placek et al based on their anatomical site of insertion.(Table 1)

NORMAL ANATOMY	
CLASS I	Mucosal insertion at the mucogingival junction
CLASS II	Gingival insertion below the mucogingival junction and above the gingival margin of central incisors.
ANOMALOUS ANATOMY	
CLASS III	Papillary insertion, buccally between the teeth
CLASS IV	Papillary insertion, at palatal papillae

TABLE 1. Anatomical classification of frenum insertion modified from Placek et al., 1974 and Kotlow, 2004.

Aberrant or abnormal frena is visually detected by tension application onto the papilla tip and thereby observing its movement or blanching due to ischemia. According to Miller the frenum is characterized as pathogenic when it is either unusually wide or there is an absence of an apparent zone of attached gingiva along the midline, or a shift of the interdental papilla occurs when the frenum is extended.[8] Clinically, papillary and papilla penetrating frenum are considered as pathological and appear to be associated with loss of papilla, diastema, gingival recession, difficulty in brushing, malaligned teeth as well as prejudice the denture fit or retention causing psychological disturbances to the individual.[6]

Olivi et al [10], reported the clinical indications for frenum removal as:

- i. Aberrant frenum related to inflamed gingiva, causing poor oral hygiene.
- ii. Aberrant frenum associated with gingival recession.
- iii. Maxillary frenum related to a diastema after complete eruption of the permanent canines.
- iv. Abnormal and/or anomalous maxillary frenum (Class III or IV), resulting in a diastema during the mixed dentition period.
- v. Anomalous mandibular frenum with high insertion, leading to the onset of gingival recession.

The management of aberrant frenal attachments includes two procedures frenectomy and frenotomy; these procedures are a part of the periodontal plastic procedures. Frenotomy comprises of the removal and relocation of the frenum to a more apical position. Frenectomy is the excision of the frenum including its attachment to the underlying alveolar bone. There are several possible approaches to frenectomy: classic frenectomy, Z-plasty, V-Y plasty, electrosurgery, or carbon dioxide laser. Frenectomy is preferred for patients with a thick and vascular frenum where severe bleeding could also be expected, and in some cases, reattachment of the frenum by connective tissue occurs.[11]

The vestibular incision method (mandibular frenectomy) is a surgical technique which involves the elimination of the abnormal frenum and simultaneously alters the vestibular depth also.[12] The current case report describes a mandibular frenectomy treated conservatively by employing v-rhomboidoplasty surgical technique for the treatment of an aberrant mandibular frenum.

Case Report

A 29 year old male patient reported to the Department of Periodontics, DAPMRV Dental College with the chief complaint of irregularly placed lower front teeth as well as a growth on the lower lip. There was no associated pain or

sensitivity. The patient had no relevant dental or medical record.

On examination the patient had an aberrant buccal frenum with a gingival attachment with respect to left mandibular canine and Millers [13] class I gingival recession with a recession depth of 1-2 mm. The patient underwent full mouth scaling and root planing and 0.2% chlorhexidine mouthwash was prescribed, which was to be used twice daily 30 minutes after brushing with a soft bristled toothbrush.

Frenectomy of the aberrant labial frenum in relation to the mandibular left canine was planned to improve aesthetics and to prevent further gingival recession of the same tooth. The area of interest was anaesthetized using 2% lignocaine with 1: 80000 adrenaline and the labial frenectomy was performed. The labial frenum was made taut by gently averting and pulling out the lips, and the centre of the frenum was clasped with a help of a tissue forcep. The technique used was V-Rhomboidoplasty. A hemostat was placed to engage the frenum. Then incision was placed along the upper surface of the hemostat, simultaneously a similar incision was made along the under surface of the hemostat with number 15 Bard Parker blade. A triangular portion of frenum was resected along with the hemostat. A horizontal incision was placed to dissect and separate the fibers attached to the bone. Later, the area was sutured without tension to maintain its apical position and covered with a tin foil to prevent reattachment of the tissue and to allow granulation to occur at a greater depth.[12]

Periodontal dressing was applied and patient was prescribed analgesics to be taken twice daily for 2-3 days to relieve pain. The sutures and dressing were removed after 1 week. Postoperatively the healing of the tissues at the site of the frenectomy was uneventful and the patient was able to maintain adequate plaque control.



Fig. 1. Aberrant Mandibular Frenum



Fig. 2 Frenectomy with V-Rhomboidoplasty



Fig. 3. Rhomboidal incision



Fig. 4. Sutures placed



Fig. 5. Tin foil placed on suture area



Fig. 6. Periodontal pack placed



Fig. 7: One week postoperative view



Fig. 8. 3 months postoperative view

Discussion

The attachment of the labial frenum and its significance in periodontal health is a crucial aspect of treatment plan whereas aberrant frenal attachments are attributed to the individual's genetics or due to gingival recession reaching the frenal attachment.

The mucosal sort of the labial frenum attachment is the foremost type, with a percentage of 46.6% in maxillary and 92.1% in mandibular arch. The gingival type of frenum attachment is the second most common, appearing in about 34.4% within the maxillary and 6.5% within the mandibular arch. The papillary sort of the labial frenum attachment appears in 3.1% and 0.2% respectively, while the papilla penetrating appears in 16.1% within the maxillary and 1.2% the mandibular arch.[5] They are generally in close proximity to the gingival margin creating a gingival tension causing recession and mucogingival deformities,[1,2] thereby accumulating plaque and calculus, leading to inflammation and pocket formation which is detrimental to the periodontal health[14] and aesthetics. The presence of muscle fibers along with the elastic and collagen fibres of the gingiva in the frenum exerts destructive forces

Hirschfeld (1939) pioneered the excision of the marginal attachment of the frenum, terming it to be an etiology of periodontitis.[15] The traditional technique of frenal excision was introduced by **Archer (1961)** and **Kruger (1964)** which incorporated interdental tissues as well as the palatine papilla alongside the frenulum.

Majority of the aberrant frenal attachments requiring treatment include the labial frenii followed by lingual frenum in cases of ankyloglossia. In few cases, buccal frenum poses as aberrant frenal attachments. However the presence of an adequate keratinised gingiva attached coronal to the frenum prevents its aberrancy.

The classical technique was introduced by Archer and is an excision type, advocated in the midline diastema cases, it ensures minimal complications by removal of the muscle fibers along with dense connective tissue up to the extent of the alveolar bone to prevent recurrence and eventual pathological sequelae.[16] The classical technique leaves a longitudinal surgical incision and scarring, which may lead to periodontal problems and an anaesthetic appearance, thereby necessitating other modifications such as Miller's technique, V-rhomboidoplasty and Z-plasty to treat an aberrant labial frenum.[3]

In the present case the buccal frenum in reference to mandibular left canine gave a positive tension test and was thought to cause gingival recession of the concerned tooth as well as unaesthetics. Due to this, frenectomy of mandibular left canine was planned to stop further recession and loss of supporting tissue which might lead to dentinal hypersensitivity and a predisposition to cervical or root caries. There was uneventful healing with minimum postoperative pain and scarring. During a 3 month evaluation no scarring was observed and there was an adequate amount of vestibular depth associated with the concerned tooth.

Lasers and electrocautery are recent techniques which address the management of an aberrant frenum bearing advantages like minimal time consumption, mild bleeding and the minimal postoperative complications.[17,20,21] however they are expensive and the patient was apprehensive to its treatment.

Conclusion

An aberrant frenum may cause inadequate oral hygiene maintenance and aesthetics affecting periodontal health and resulting in other mucogingival problems. While aberrant frena are often removed by any of the proposed modification techniques, a functional and an aesthetic

outcome is achieved by the correct technique selection, based on the type of the frenal attachment. Approaches like electro surgery and lasers have merits, however further improvements can still be attempted.

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