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(CASE REPORT)

Management of maxillary midline diastema caused by aberrant frenum attachment: A case report

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Abstract

Background: Midline diastema in the maxillary is very common aesthetics problem in mixed and early permanent dentition, one of which etiology is aberrant frenum attachment. High frenum attachment might interfere with aesthetics, plaque control, and create mucogingival deformities, therefore compromising orthodontic result and causing recurrence. Several treatments for maxillary midline diastema are available, one of which is labial frenectomy.

Objective: To present a case report of frenectomy as a mean of eliminating maxillary midline diastema.

Case: This is a case report of a 25 years old female patient with high frenum attachment causing maxillary midline diastema. Patient was treated with frenectomy afterward. Frenectomy is a complete removal of frenum, including the attachment to the underlying bone. Following the treatment, midline diastema closure was showed in 4 months following frenectomy.

Conclusions: Frenectomy is a potential alternative for treatment of maxillary midline diastema.

Keywords: Frenectomy; Maxillary midline diastema; Aberrant frenum

1. Introduction

Aesthetics concern has led to an increasing importance in seeking dental treatment with ultimate purpose of achieving perfect smile. The continuing presence of a diastema between the maxillary central incisors in adults has been considered as a prevalent aesthetics problems [1]. Maxillary midline diastema (MMD) is defined as a spacing greater than 0.5 mm between proximal surfaces of maxillary central incisor [2]. Presence of high frenum attachment is one of the more common etiological factors for persistence of a midline diastema, therefore focus on the frenum has become essentials [1]. Labial frenum attachments are folds of membrane with shrouded muscle fibres originate from orbicularis oris muscle of upper lip that attached the lips to alveolar mucosa and periosteum [3]. The function of frenum is to provide stability to the upper and lower lips and the tongue [4] and the involvement in mastication is still unknown [1]. Depending on the extension of attachment fibres, frenum have been classified as [5]:

- Mucosal : the frenum fibres are attached to mucogingival junction (MGJ)
- Gingival : fibres are inserted within attached gingiva
- Papillary : fibres are extending into interdental papilla
- Papilla penetrating : frenum fibres cross the alveolar process and extended to palatine papilla

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Aberrant frenum can be detected visually by making tension at the frenum to see the movement of papillary tip or blanch test procedure which produced due to ischemia of the region [6]. Papillary and papilla penetrating frenum considered to be pathological and have been associated with loss of papilla interdental, gingival recession, midline diastema, and difficulty in brushing teeth , misalignment of teeth and psychologic disturbance to the individual.

The aberrant frenum can be treated by frenectomy or frenotomy procedure. Frenectomy is a complete removal of the frenum and the attachment to the underlying bone, while frenotomy is a procedure of incision and relocation of the frenal attachments [7]. There are different techniques for frenectomy, one of these is the conventional technique with scalpels and periodontal knives, electrosurgery and the other one is using the soft tissue lasers [1].

2. Case Report

A 25 years old female patient came to orthodontics policlinic with chief complaint of persistent midline diastema even after having undergone orthodontic treatment. Orthodontic department referred the patient to periodontics department in order to resolve the midline diastema problem. On clinical examination, it was shown that patient's frenum attach to the interdental papilla (papillary attachment – Figure 1). It was then decided that frenectomy would be done in order to resolve the problem. The case was treated surgically using conventional technique.

2.1. Case Management

The frenectomy procedures in this case was done through the following method:

- The frenum was anaesthetized with local infiltration using 2% lidocaine with 1:80000 adrenaline
- The frenum was exposed using cheek retractor (Figure 1)
- The frenum was engaged with a hemostat, inserted into the depth of the vestibule (Figure 2)
- Incisions was done on the upper area and the undersurface of the hemostat until the hemostat was free by using surgical blade no. 15C (Figure 3)
- A blunt dissection was done on the bone using Orban knife in order to relieve fibrous attachment (Figure 4)

The diamond shape wound was sutured by using 4-0 blue nylon with single interrupted sutures (Figure 5)

The patient was then discharged only with oral antiinflammation medication. Follow up consultation after the procedure was scheduled regularly. In oral examination 4 months following the surgery, the patient had no complaint about pain at the mucosa of the upper lip. The gingiva and the labial mucosa appeared to be normal in contour and color.

Midline diastema closure was noted spontaneously in 4 months following frenectomy.

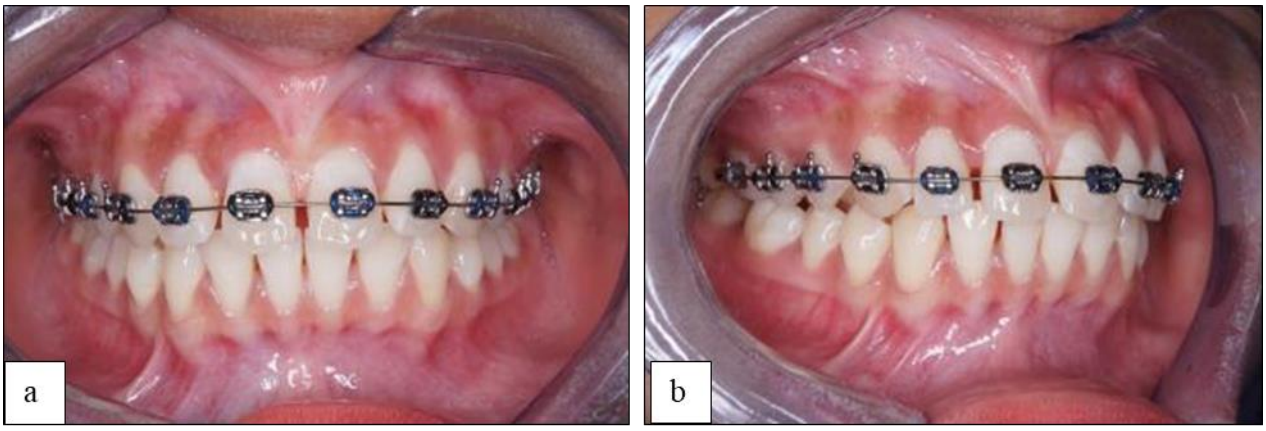

Figure 1 Pre-operative image of patient (a) Facial view (b) Sagittal view

Figure 2 (left) Engagement of frenum with hemostat

Figure 3 (right) Incisions using surgical blade no. 15C

Figure 4 (left) Blunt dissection

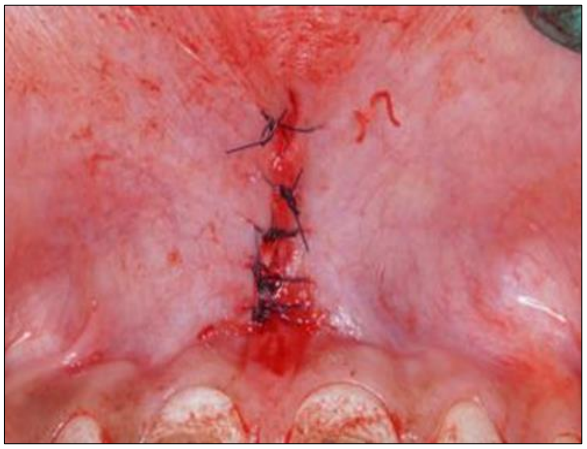

Figure 5 (right) Incisions using surgical blade no. 15C

Figure 6 (down) Midline diastema closure 4 months following frenectomy

3. Results and discussion

Abnormalities in the size and location of frenum may lead to the development and persistence of midline diastema, gingival recession, and speech problems [8]. Such conditions require complete excision of the frenum attachment including the interdental area to the underlying alveolar process. Frenectomy is a complete removal of the frenum, including its attachment to the underlying bone, while frenotomy is the incision and the relocation of the frenum attachment [1,3,7]. Excisional with conventional technique of aberrant labial frenum also remove the muscle fibres connecting the orbicularis oris with the papilla palatine along with connective tissue to the level of the alveolar bone to prevent its recurrence [9]. Conventional technique with scalpel as primary main tool of resection is the most commonly used method for frenectomy is a safe surgical procedure with no notable complications [1,9]. The benefit of conventional techniques is easy to applied. In conventional frenectomy technique, the sutures placed in the corner of diamond shape

wound without making any tension. Secondary intention healing occurred because the gingiva can't closed completely [10]. Conventional technique results in a longitudinal surgical incision and scarring, that lead to various periodontal problems, scars and an unaesthetic appearance [11]. A number of modifications surgical techniques for removal of aberrant frenum including Miller's technique, V-Y plasty and Z-plasty, electrosurgery, lasers diode, carbon dioxide, Nd:YAG, Er:YAG and Er,Cr:YSGG. In spite of the various modifications proposed for frenectomy, the most widely followed procedure remains to be classical technique [1,9]. Most patients have a good feedback and comfort with minimally traumatic methods like conventional frenectomy technique. Aberrant frenum can interfere diastema space closing from orthodontic treatment and cause trauma and pain. Frenectomy was done to accelerate the orthodontic movements. After frenectomy the patient is immediately ready to continue other orthodontic treatment. Furthermore, frenectomy is studied to reduce the risk of midline diastema relapse [10].

4. Conclusion

Frenectomy and concomitant orthodontic treatment is dependable as a treatment in order to induce spontaneous closure of the maxillary midline diastema with high frenum attachment.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

No conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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