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Case Report

Immediate Aesthetic Management of Midline Diastema in Patient with High Frenal Attachment- A Case Report

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Abstract

A midline diastema is generally considered a part of normal dental development during the mixed dentition period. However, there are multiple factors which can cause diastema requiring intervention. An enlarged labial frenum has been blamed for most persistent diastemas, but its etiologic role now is understood to represent only a small proportion of cases. The frenum is a mucous fold that serves as an attachment for lips and cheeks to the alveolar mucosa, the gingiva, and periosteum. This frena hampers the gingival health when they are attached too close to the marginal gingiva. This happens either due to an interference in the plaque control or to a pull by muscle. The maxillary frenum presents with aesthetic problems and can also compromise the orthodontic treatment outcome in cases of midline diastema, therefore causing recurrence after the treatment. An abnormal frenum can be managed by frenectomy. The present case report demonstrates the removal of the abnormal labial frenum attachment in a 16 year old male patient using conventional technique and composite build up for midline diastema in single sitting.

Keywords: *Frenum; Diastema; Aesthetics; Conventional (Classical technique); Nanocomposite*

Introduction

Aesthetic concerns have led to an increasing importance in seeking dental treatment, with the purpose of achieving perfect smile. The continued presence of a diastema between the maxillary central incisors in adults, is an aesthetic problem that can be closed either orthodontically or restoratively [1,2]. Frenal attachments are mucous folds that attaches the lips to the alveolar mucosa and its periosteum. Oral cavity shows several frena, like maxillary labial frenum, the mandibular labial frenum and the lingual frenum. Abnormal frenum is detected visually, by observing movement of the papillary tip after applying tension and also by the blanching seen due to ischemia of the region [3]. Depending upon the extension of attachment of fibers, frena are classified as-a) Mucosal--when the frenal fibres are attached up to mucogingival junction. b) Gingiva--when fibres are inserted within attached gingiva. c) Papillary - when fibres are extending into interdental papilla and d) Papilla penetrating - when the frenal fibres cross the alveolar process and extend up to palatine papilla [4]. Clinically, the last two types of frena are pathological and are associated with loss of papilla, diastema, teeth malalignment and it may also compromise the fit of the denture or its retention [5,6].

Case Report

A male patient aged 16 years reported to the department of Dentistry IGIMS, Patna with the chief complaint of spacing in the upper front region of the jaw (Figure 1). On clinical examination, the patient had midline diastema in upper arch. This diastema was associated with high papillary frenal attachment and tension test was found to be positive. Though local factors were present but no clinically evident gingival recession and trauma from occlusion were seen. After complete evaluation and a detailed history, conventional (classical) frenectomy was decided as the choice of treatment.

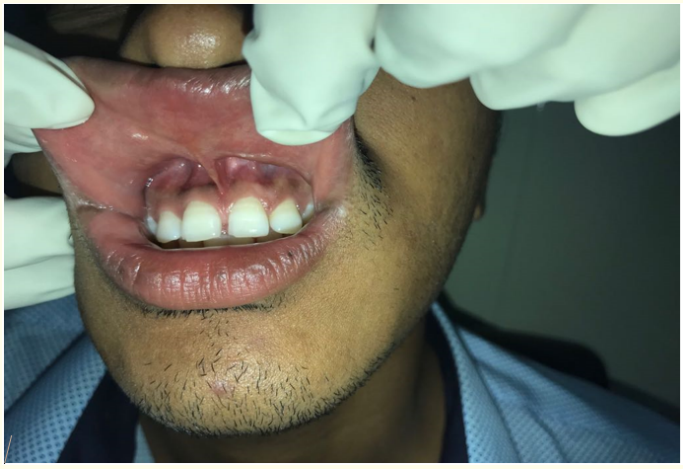

Figure 1: *Papillary penetrating frenum.*

After explaining the intra and post-operative aspects to the patient, informed consent was obtained to perform the procedure. The area was anaesthetized using 2% lignocaine. Infiltration was given both on the labial and on the palatal region near the base of the papilla. The frenum was engaged by haemostat inserted into the vestibular depth. Incisions were placed initially on the upper and then on the under surface of the haemostat. The resected portion of the frenum was removed. The fibrous attachment was relieved using blunt dissection (Figure 2). The edges of the wound were sutured by using 3-0 mersilk with interrupted sutures (Figure 3). In the same sitting Nano composite was used to close the midline diastema followed by finishing and polishing. Wound care instructions along with medicines were given to the patient. The patient was recalled after 1 week to remove suture (Figure 4).

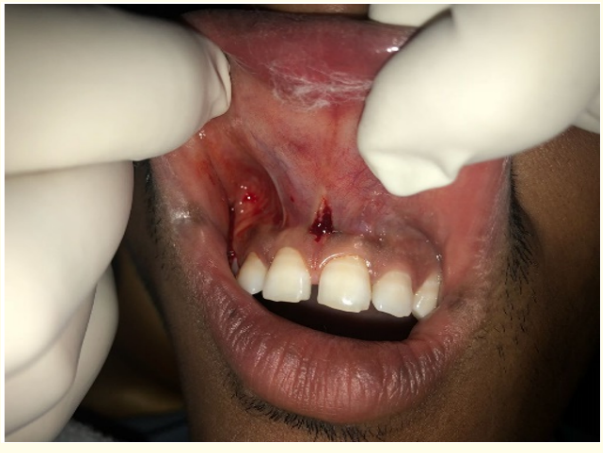

Figure 2: *Excision of the frenum.*

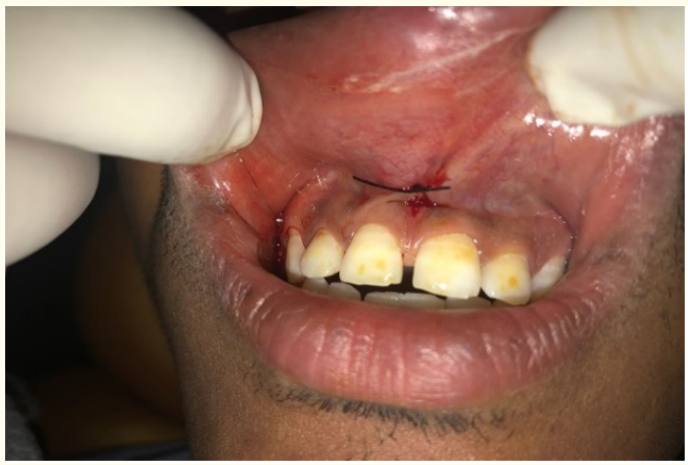

Figure 3: *Suturing of the site.*

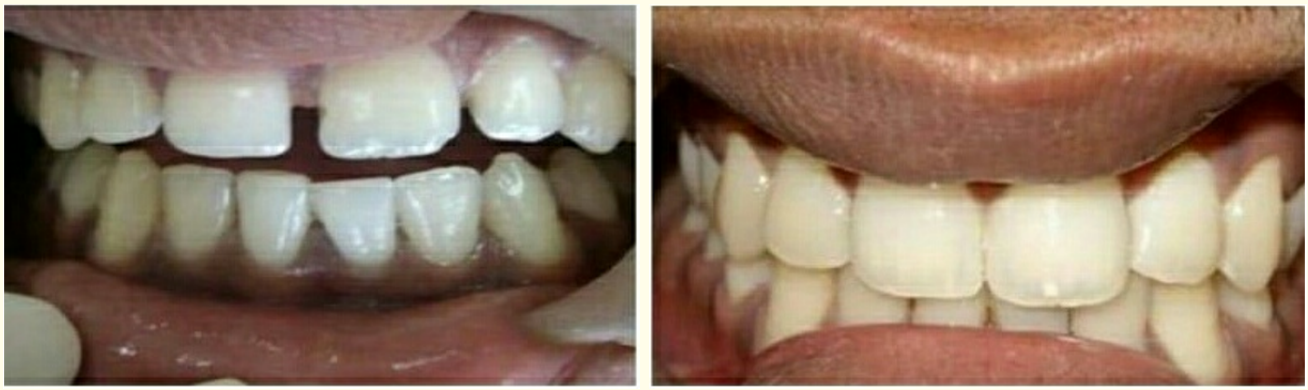

Figure 4: *Pre-operative and Post- operative.*

Discussion

Conservative techniques are being adopted in order to create functional and aesthetic results [7]. The focus on the frenum has become essential as the aberrant frenum is considered as one of the etiological factors for midline diastema persistence. Frenectomy or Frenotomy are the procedures to treat aberrant frenum. Frenectomy is the complete frenal removal, whereas frenotomy is the incision and the relocation of the frenum [7]. The management of aberrant frenum has travelled a long journey from Archer's and Kruger's "classical techniques" of total frenectomy to Edward's more conservative approach [3]. The classical technique carries the advantage of having fast healing rate. The healing takes place by primary intention which leads to minimal scar formation. There is initial haemorrhage followed by approximation of cut wound ends due to epithelial cell migration and proliferation. Also, there is interplay of various pro-inflammatory cells and mediators with no granulation tissue formation. The wound is strengthen with the collagen laid down by fibroblast cells [8]. Newer techniques include frenal relocation by Z-plasty, frenectomy with graft and laser. Every method has its own pros and cons. Inspite of the several modifications for frenectomy, the classical technique is being followed [9]. Therefore, in the present case classical technique of frenectomy was performed.

Nanocomposites were used as the first choice amongst composites for midline diastema closure. The recent advent of nanotechnology has allowed manipulation of composites resulting in the unique materials called Nanocomposites. In nanocomposites, the nanosized filler particles improves its mechanical properties.

They possess greater modulus of elasticity, higher flexural, compressive and diametrical tensile strengths, increased fracture toughness and wear resistance. The decreased inter-particle distance between the nanofillers reduces its tendency to form cracks. The increased filler loading and strong interfacial interactions between the resin and filler results in lesser polymerization shrinkage. It also respond in a better way to the functional masticatory stresses. Clinically, there are less micro-fissures which results in an improved marginal seal and color stability [10]. In the present case nanocomposite with combined properties of strength and aesthetics was chosen for management of midline diastema.

Conclusion

Midline diastema closure with frenectomy can be done in single sitting which not only saves patients time but also provides restoration with immediate aesthetics. High frenal attachment is one of the most important cause and should be eliminated for long term success. While an abnormal frenum can be removed by any of the techniques, a functional outcome can be achieved by a proper technique selection. Even though the approaches of not using the traditional scalpel, like electro surgery and lasers have merits, further improvements can still be endeavoured, which includes biological restoration.

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