



## Z-PLASTY - A CLASSICAL ESTHETIC ERASER FOR ABERRANT LABIAL FRENUM.

### Periodontology

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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. The high frenum attachment results in muscle pull and leads to various periodontal problems like gingival recession which can also interfere with the plaque removal and hamper the gingival health. This situation can be managed by frenectomy. In addition to this, the maxillary frenum may present aesthetic problems or compromise the orthodontic result in the midline diastema cases, thus causing a recurrence after the treatment. Several methods to eliminate ectopic frenal attachments have been suggested, including frenectomy (elimination) and frenotomy (repositioning). Labial frenectomy is the complete removal of the frenum which often attaches to the center of the upper lip and between the upper two front teeth. The present case report demonstrates the frenectomy of an aberrant labial frenum in a 35-year-old female using the Z-plasty technique.

### KEYWORDS

Z-plasty technique, Aberrant hypertrophied frenum, inter-incisal diastema, Frenectomy.

### INTRODUCTION:

Esthetic concerns have led to increased demand in seeking dental treatment for achieving a perfect smile. The presence of aberrant hypertrophied frenum is one of the common causative factors for the persistence of inter-incisor diastema, it becomes essential to focus on the importance of frenum in terms of morphology and attachments<sup>1</sup>. The frenum is a mucous membrane fold that attaches the lip and the cheek to the alveolar mucosa, the gingiva, and the underlying periosteum<sup>1</sup>. Hyperplastic frenula arise when there is a thick fibrous tissue attachment between the upper incisors and are often associated with a midline diastema. It can also result in periodontal and speech problems<sup>2,3</sup>. Labially thickened and high attached maxillary frenum is commonly regarded as contributory etiology for maintaining midline diastema and delayed upper jaw development, so the focus on the frenum has become essential.

The frena may also jeopardize the gingival health by causing a gingival recession when they are attached too closely to the gingival margin, either because of an interference with the proper placement of a toothbrush or through the opening of the gingival crevice because of a muscle pull<sup>4</sup>. This anomaly not only favours the development of interincisal diastema- which also promotes the orthodontic treatment modalities and also restrict the lip movements (Marcedo et al; 2012)<sup>5</sup>.

### THE MUSCULAR ANATOMY OF THE FRENUM:

Knox and Young histologically studied the frenulum, and they have also reported both elastic and muscle fibres (Orbicularis Oris-horizontal bands and Oblique fibres).

However, Henry, Levin and Tsaknis have found considerably dense collagenous tissue and elastic fibres but no muscle fibres in the frenulum<sup>4</sup>.

### DIAGNOSIS:

Bowers test is used for the assessment of the abnormal frenum which shows traction on the lip in the vestibular and in apical directions. In case of movement or ischemia of papilla, removal of the frenum is indicated both for esthetic and functional reasons (Bowers, 1963)<sup>6</sup>.

Also, on the other hand abnormal frena were detected visually by applying tension over the frenum to see the movement of the papillary tip or the blanch which is produced due to ischaemia in the region. Generally, the diastema appears on the midline between the maxillary

and mandibular central incisors, in a triangular shape, forming fold in the alveolar mucosa that interconnects the internal surface of the lip with the gingiva and periosteum (Rose et al; 2018)<sup>7</sup>.

### TYPES:

The labial attachment frenum has been categorized into following 4 types i.e., mucosal, gingival, papillary and papillary penetrating, by Placek et al (1974)<sup>1</sup>.

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.

### INDICATIONS:

The frenum is characterized as pathogenic and is indicated for removal when-

- An aberrant frenal attachment is present, which causes a midline diastema.
- A flattened papilla with the frenum closely attached to the gingival margin is present
- which causes a gingival recession and a hindrance in maintaining the oral hygiene.
- An aberrant frenum with an inadequately attached gingiva and a shallow vestibule is seen.

### TREATMENT AND SURGICAL INTERVENTIONS:

There are various modalities used to excise the frenum, it can be performed by conventional method using blade and scalpel, using soft tissue laser or electrocautery. Below are the conventional frenectomy techniques employed:

1. Conventional (classical) frenectomy
2. Miller's technique<sup>12</sup>
3. V-Y Plasty
4. Z Plasty<sup>15</sup>
5. Frenectomy by electrosurgery and Laser<sup>11</sup>

However, frenectomies commonly fail due to a high risk of

reoccurrence and hypertrophic scarring. The likelihood of failure can be reduced by using a technique known as Z-frenuloplasty, which is a soft tissue surgery used to lengthen frenum and to improve the functional and cosmetic appearance of scars. It provides excellent outcomes in cases of hypertrophic thick frenula with a low insertion and a shallow sulcus. Design of the Z-plasty with unequal angles and limbs creates a situation, in which the smaller triangle moves significantly less than the larger triangle. This may be useful in areas where small amounts of tissue need to be moved with as little distortion as possible e.g., near eyes, lips<sup>14,15</sup>. Another modified approach include, a horizontal incision without severing the frenum in the midline along with basic Z-plasty flaps that are transposed in the similar manner<sup>16</sup>. The Z pattern is efficient as:

- It facilitates re-distribution of tension on the skin and the wound and helps in healing along the skin lines
- It minimizes scar formation and has got a camouflaging effect.

The present case report aimed to approach aberrant labial frenula using novel modified Z-plasty technique of frenectomy with an added note on merits and the demerits of this procedure.

**CASE REPORT**

A 35 year old female patient reported to the Department of Periodontology at King George's Medical University, Lucknow (UP). Patient reported with the chief complaints of a midline diastema between maxillary central incisors and also difficulty in brushing. On examination, pull tension test revealed a papillary penetrating type of hypertrophied frenum associated with midline diastema was found. Along with it, tension test was positive with inadequate width of attached gingiva. Medical history was not significant. Patient was thoroughly explained about procedures and an informed consent was taken.

**ARMAMENTARIUM:**

Haemostat, Tissue forceps, Scalpel blade no. 15, Gauze Sponges, 4-0 black silk suture, suture plier, scissors, Castroviejo scissors, and a periodontal dressing.

**SURGICAL PROCEDURE:**

A case of a hypertrophic attached type of frenal attachment was operated by using the Z-plasty technique.

- The area was anaesthetized using local infiltration by using 2% lignocaine with 1:80,000 adrenaline.
- Papillary penetrating type of hypertrophied frenum was present between the two maxillary central incisors. (Fig:1)



Pre-operative attached type of frenal attachment (Fig:1)

- Haemostat was inserted to deepest depth of vestibule.
- With the help of No.15 Bard Parker blade, two parallel vertical incision was given.
- Triangular resected frenum was removed and underlying tissue was exposed. (Fig:2.)



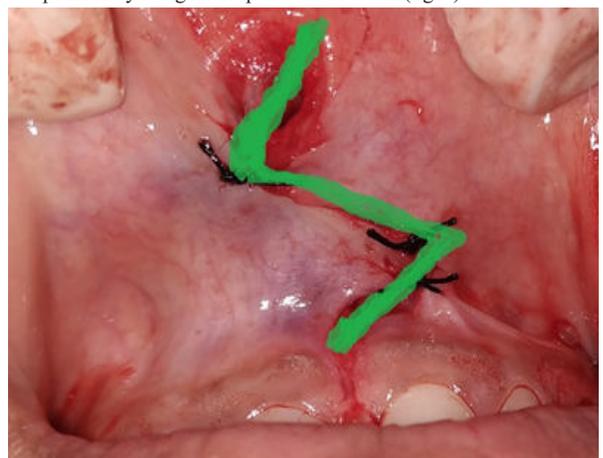
Incision given through the frenum (Fig:2)

Horizontal incision was made to separate the attached fibres with gradually blending of vestibular tissue. The length of the base was incised with 15 c scalpel and at each end, horizontal incisions were made to separate the attached fibres (ranging between 60- and 90-degree angulations) was made in equal length to that of the band. With the help of a tissue forceps, the submucosal tissues were dissected beyond the base of each flap, into the loose non-attached tissue planes. A double rotation flap of at least 1 cm in length was prepared. With the surgical blade, the deeper fibers are detached from the underlying periosteum in a criss-cross manner. The resultant flaps were mobilized and transposed at 90 degree to close the vertical incisions horizontally.(fig: 3)



Obtained two triangular flaps (Fig:3)

- They are then sutured to the defect on the opposite side of the other flap base forming "reverse z shaped" (fig:4)
- The "Z-shape" triangular flap was prepared using incisions and tip of two transpositional flaps was sutured first as depicted in (fig:5)
- And finally at last the complete triangular flaps was secured in position by using interrupted 4-0 black silk.(fig: 6)



Flaps transposed across the midline sutured in the form of reverse Z.(Fig:4)



Flaps are repositioned prior to closure by suturing the tip of 2 triangular flap (Fig: 5)



Suturing depicts reverse z formation after complete closure (fig: 6)

#### POST-OPERATIVE INSTRUCTIONS:

Patient was instructed to take soft diet for a week, and antibiotics and analgesics were also prescribed. Patient was also asked to maintain good oral hygiene using mechanical and chemical plaque control techniques.

Patient recalled after 7 days for suture removal .at 1 month of follow up the healing was found to be uneventful, with no hypertrophic scar formation and tension at the frenum area. (Fig:7)



1month Post-operative (Fig:7)

#### CONCLUSION:

Always adequate technique should be selected based on the type of frenal attachments for achieving esthetics and functional outcomes. Z-plasty techniques allows tissue healing by primary intensions, reduces the risk of contracture formation and increases tissues recovery. So, this procedure considered to be safe and cost-efficient procedure as it, results in better functional and esthetic appearance.

We should always keep in mind that the technique which you choose is

always simple to perform and patient should be completely satisfied with the desirable results. Early detection and treatment of certain types of hypertrophied frenum attachments prevents complicated midline diastema, malocclusions and also restores esthetics and increases the self-esteem of periodontics patients

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