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Research article

Z Plasty – An Aesthetic Surgery for Aberrant Labial Frenum: A Case Report

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Abstract.

Background: Aberrant labial frenum can cause central diastema, gingival recession and affect aesthetic appearance. Several techniques are available for removing the attachment of an abnormal frenulum. Z-plasty is a surgical technique used for thick and wide hypertrophy frenum associated with central diastema and short vestibule.

Objective: To discuss the Z-plasty technique for aberrant labial frenum.

Case Report: A 23-year-old woman was referred to the Periodontia Department of Hasanuddin University Dental Hospital for a frenectomy. Intraoral examination showed a diastema on maxilla centralis incisive and a labial frenulum's attachment extending to the palatine papilla. The frenectomy procedure was performed using the Z-plasty technique.

Results: Follow-up after one week and one month showed a good healing process with minimal scars and gingival color according to the surrounding tissue.

Conclusion: Z-plasty frenectomy can provide good aesthetic and functional results for removing the attachment of hypertrophy frenum.

Keywords: frenectomy, labial frenum, hypertrophy frenum, Z-plasty

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1. Introduction

A Frenulum is a mucous membrane fold with covered by muscle fibers and triangular, which is attached to the lips and cheeks to the alveolar mucosa or gingival and underlying periosteum. The muscles's attachment can limit the movement of the lips and cheeks [1,2,3]. Normally, the frenulum develops vertically in the alveolar mucosa and attaches apically. However, when the attachment of the frenulum fibers fails to migrate apically, the band remains between the maxilla centralis incisivus, causing the deviation of the frenulum to become permanent [4]. This condition can cause a central diastema, gingival recession and affects the patient aesthetics [3,5].

Placek et al (1974) have classified the labial frenulum attachment based on the extension of fibers attachment as follow [2,6,7]:

a. Mucosal: When the frenulum attaches to the mucogingival junction

b. Gingiva: The frenulum is in the attached gingiva

c. Papillary: The frenulum's attachment extends to the interdental papilla

d. Papilla penetrating: The frenulum penetrates to the palatine papilla by crossing the alveolar process.

The aberrant frenulum can be detected visually using a blanch test that applying tension on the upper lip to see the movement of the papillary end which produces an ischemic region [4,8,9]. There are two procedures to resolve the attachment of aberrant frenulum, frenectomy and frenotomy, which can be done in conventional surgery, electrosurgery, or using the laser. Frenectomy is a surgical procedure that involves the total removal of the frenulum, including its attachment to the underlying bone, and is used to correct abnormal diastema, while frenotomy is an incision procedure and relocates the frenulum attachment to produc an attached gingival area between the gingival margin and the frenulum [2,10,11].

There are various techniques used to correct an abnormal frenulum, including simple excision, Miller technique, V-Y plasty and Z-plasty [7,10]. In this case report using the Z-plasty technique, which is indicated for frenum that has thick and width hypertrophy, which is associated with central diastema and short vestibule [3,5].

2. Case Report

A 23 years old female patient was referred to the Periodontia Department of Hasanuddin University Dental Hospital for a frenectomy. On extraoral examination, patient have no abnormalities and medical history. While intraoral examination there was a diastema on maxilla centralis incisivus and a labial frenulum's attachment extends to palatine papilla (Figure 1) so the patient was diagnosed papilla penetrating of frenum attachment. The patient had been used a fixed orthodontic for 3 years ago, but relapsed after 5 months was removed, the patient also complained of difficulty in moving the upper lip. Recently, the patient will be doing re-orthodontic treatment, so that the patient needed a frenectomy. After the operator explains the procedures, the patient signs an informed consent. The prognosis is good because the patient cooperatif, normal gingiva, good oral hygiene and there is no systemic disease.

Figure 1: Preoperative view. The frenulum is thick and width, the attachment extends to the palatine papilla (Source: Author's own work).

2.1. Surgical Procedures

Preparation of armamentarium includes local anesthetics, blade no.15c, clamps, tissue scissor, tissue tweezer, 6-0 nylon and needle holder. The surgical procedure was done as follows disinfected the surgical area with iodine solution, then local anesthesia to infiltrated vestibule area on the labial and palatal surface near the incisivus foramen (Figure 2). A vertical incision was made from the bottom of the frenulum to the labial attachment using blade no.15c and the mucosa was separated from the lip muscles. After that two horizontal incisions were made with the same length as the vertical incision on the left and right sides with an angle of 60^o (Figure 3). The incision produced a triangular flap with the same shape and size, then irrigated with saline solution. The triangular flap was transposed to the opposite side to produce a new position and stabilized with simple interrupted suture and nylon 5-0 (Figures 4). Amoxicillin 500 mg (three times a day for 5 days), ibuprofen 400 mg (twice a day for 2-3 days) and antimicrobial rinse 0,2% chlorhexidine gluconate (twice a day for 2 weeks) were given with postoperative instructions.

Figure 2: Desinfected using iodine solution and local anesthesia on surgical area (Source: Author's own work).

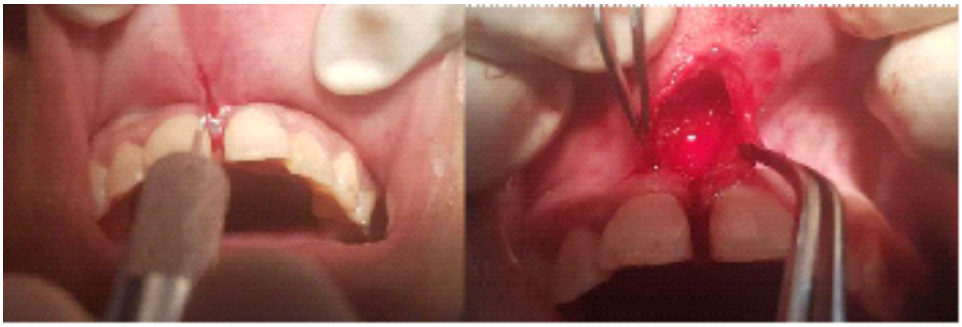

Figure 3: Vertical incision using blade no.15c and the flap was transposed to the opposite side (Source: Author's own work).

Figure 4: The flap was stabilized with a simple interrupted suture (Source: Author's own work).

2.2. Treatment Result

One week after surgery, the patient was called back for follow up. Suturing was removed, gingival examination showed good healing with minimal scar (Figure 5). Then the patient was followed up again one month postoperative showed no scar and the color ofthe gingiva by following the surrounding tissue and increasing the depth of the vestibule (Figure 6). The patient was satisfied with the treatment result because good aesthetic, no pain and swelling, faster healing and lower cost.

Figure 5: Suturing was removed one week after surgery (Source: Author's own work).

Figure 6: Follow up after one month (Source: Author's own work).

3. Discussion

The attachment of the frenulum can be a serious problem if it causes gingival inflammation associated with poor oral hygiene, gingival recession, and tissue that inhibits the closure of central diastema during orthodontic treatment. This condition was indicated for the removal of the frenulum [3,12]. In this case report the patient's frenulum has hypertrophy where it appears thick and width, short vestibule and central diastema. Frenectomy procedures often fail because they cause scarring in hypertrophy and a high risk of recurrence. The failure can be eliminated by using the Z-plasty technique [10].

Z-plasty was first introduced by Denonvilliers in 1856 to repair eyelid scars but has now been used in every part of the body. Z-plasty is a plastic surgery procedure that improves the aesthetic and functionality of scars. This procedure involves a central incision and making two triangular flaps with the same dimensions which are then transposed to one another so that the wound's shape is "Z". This makes the tissue strain distributed in various directions, reducing wound disruption and allowing better healing. Because of diverts and lengthens the wound in the tissue will reduce scar formation and also helps in increasing the depth of the vestibule that is not possible with other techniques [3,13]. Flap necrosis, hemorrhage, wound infection, and sloughing of the flap due to excessive wound tension are all possible consequences of Z-plasty frenectomy. However, these complications can be prevented by precise and careful technique [13].

The basis of the Z-plasty design uses 60^o angles on each side. This angle determines the degree of tissue extension, the larger the angle, the greater the extension. Angle more than 60^o will increase stress during transposition and make flap closure more difficult, while smaller angle makes it easier to transpose but results are poor due to less tissue extension resulting in scar formation. The length of each lateral incision must be the same as the vertical incision so that during the transposition of the flap there is

no wrinkling at the tissue angle. The accuracy of angles and length of the incision is the key to success in Z-plasty flap closure [10,13].

4. Conclusion

Z-plasty frenectomy is a technique that is reliable, easy and provides good aesthetic and functional results in removing the attachment of an abnormal frenulum that hypertrophy. This technique can minimize scar formation by distributing tissue tension in various directions.

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