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Additional Frenectomy Procedure to Achieve Anterior Esthetic after Crown Lengthening: Case Report

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Introduction

The gingival margin position **plays an important role in the** esthetics rehabilitation of maxillary anterior dentition. Gummy smile and short teeth appearance may decrease attractiveness of the smile and this can be improved by crown lengthening procedure. However, very often, the distance between gingival margin and the frenulum become closer after the procedure. Therefore, an additional frenectomy is indicated.

Objectives

To achieve successful esthetic and functional maxillary anterior segment after crown lengthening procedure with additional frenectomy.

Case and Case Management

A 24-years-old woman was referred to the Dental Hospital of Hasanuddin University for a crown lengthening procedure on maxillary anterior teeth due to short crowns and excess of gingival display while smiling. The gingival display of greater than 4 mm was identified with a high attached frenulum. Esthetic crown lengthening and frenectomy procedure were then indicated in this case. The crown lengthening procedure was performed by using a continuously external bevel incision method without any bone reduction. It was followed by a classical frenectomy technique to relocate the frenal attachment. The operation area was covered with a periodontal pack for a week.

Conclusion

The success of crown lengthening procedure is determined not only by the surgical technique, but also by other structure condition such as the location of frenulum. In some conditions, additional frenectomy is needed to enhanced the esthetic and the beauty of smile.

Keyword : *crown lengthening*, frenectomy, anterior aesthetic, additional procedure

INTRODUCTION

Gummy smile or gingival line height of more than 4 mm when smiling is often the cause of aesthetic disorders for patients. This condition can be caused due to APE which often results from growth or genetic factors that cause persistence of soft tissue around the surface of the e-mail. The prevalence of APE is reported to be around 12.1% in adult patients with an average age of 24 years.

The frenulum is a fold of mucous membrane that attaches to the lips or cheeks to the alveolar mucosa, gingiva and periosteum. The frenulum which is located in the anterior region of the maxillary incisor is called the superior labialis frenulum. The attachment of a superior superior labialis frenulum causes central diastema which has a detrimental effect on aesthetic function which is an indication for frenectomy.^{2,4,5,6,7,9}

Angle *et al* suggested that the superior labialis frenulum which is abnormal causes central diastema which can inhibit the movement of orthodontic devices. According to Popovich *et al*, there is a relationship between high frenulum attachment and the presence of central diastema which is considered the main cause of central diastema. The existence of a deviant frenulum is a contributing factor to the persistence of central diastema, so that it can be removed by a frenectomy or frenotomy procedure.^{6,7,9,11}

Frenectomy is a necessary action on the attachment of a high frenulum in order to improve aesthetics because there is a central diastema. Frenectomy is distinguished by frenotomy depending on the surgical procedure performed. Frenectomy is the removal of the frenulum as a whole, while frenotomy is action incision of the frenulum.^{2,4,5,6}

The attachment of the labial frenulum by Placek *et al* (1974) is classified as follows^{2,4,6,7} :

1. Mucosa : a frenulum attached to the mucogingival junction.
2. Gingiva : the frenulum reaches the gingival attachment.
3. Papillary: the frenulum attachment extends to the interdental papillae.
4. Penetration of the papilla: the frenulum passes through the alveolar process and extends to the palatine papillae.

The frenulum is said to be pathological and is indicated to be eliminated when the attachment of the frenulum causes central diastema and abnormalities of the frenulum with inadequate gingiva and shallow vestibule.^{2,4,7}

CASE AND CASE HANDLING

A female patient 24 years of coming to the Hospital Kande Hasanuddin University, Makassar with a chief complaint upper front teeth look short and unobtrusive appearance when smiling. On intraoral examination, a gummy smile line appears on a scale of 4.

The attachment of the labial frenulum is located on the attached gingiva leading to the interdental papilla. Patients use fixed orthodontic devices in the retainer phase.

Initial treatment with scaling in all regions is carried out. The crown lengthening and frenectomy procedure is carried out simultaneously several days later. Tissue measurements to be discarded in the crown lengthening procedure are performed with aesthetic gauges. Frenectomy is done afterwards. Postoperative control is performed on 1, 2

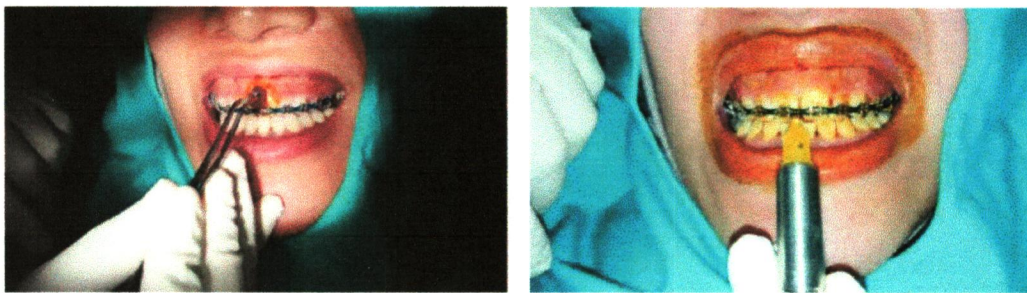


Figure 1. Disinfection and local anesthesia

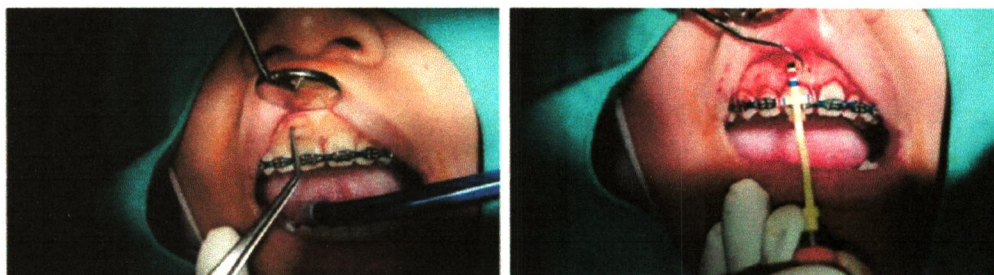


Figure 2. Measurement of pocket depth and measurement of the amount of tissue to be taken with a proportion gauge

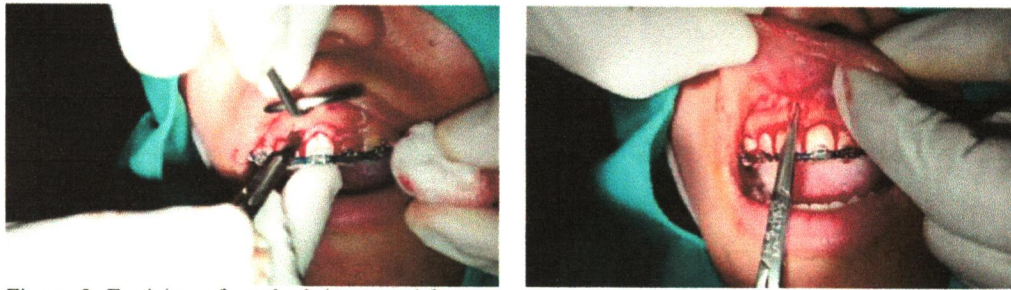


Figure 3. Excision of marked tissue and frenectomy

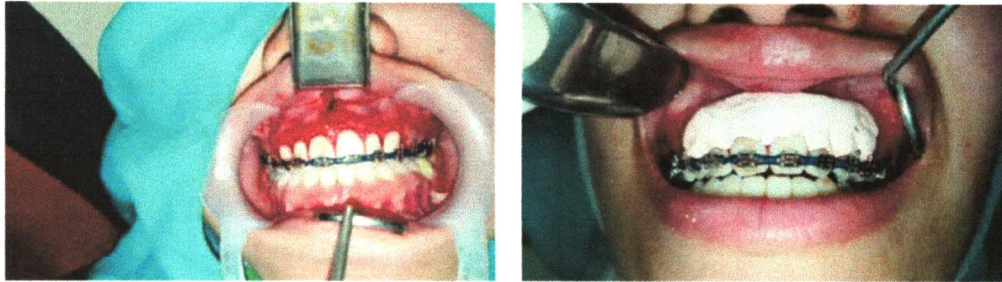


Figure 4. Wound stitched with a simple suture technique and covered with a periodontal pack

DISCUSSION

Crown lengthening is a resective procedure used to induce surgical recession. In this procedure, the gingival tissue is excised and directed to the apical. The bone structure under tissue plays an important role in the healing of late-stage tissue. The crown lengthening procedure can produce gingival embrasure around the crown restoration. This procedure also allows the clinician to determine the biological width and length of the ferrule. Bone support is the basis for adequate tissue reduction to obtain the biological width and length of the ferrule.

The final position of the gingival margin can be obtained three months or six months after surgery. This is important in the initiation of final restoration. For zones that require aesthetics, a six-month period is recommended.

Biological width involves attachment of connective tissue and junctional epithelium. Several studies have stated that the biological dimension width is different. Gargiulo et al. reported 0.97 mm epithelial attachment and connective tissue attachment 1.07 mm. The study found that measurements of connective tissue attachments gave more consistent results compared to gingival attachment measurements.

The crown lengthening procedure involves gingivectomy, Apically Positioned Flap (APF), APF with bone reduction, forced eruption with surgery and forced eruption with fiberotomy. Gingivectomy and APF have limited indications, because gingivectomy does not involve bone removal. Bone retrieval is often needed to remove bone support around the teeth to obtain adequate distance between the alveolar crest and the edge of the restoration. This procedure can be considered in patients with gingival enlargement and has a sufficient number of strong tooth structures above the alveolar crest or has thick connective tissue attachments and junctional epithelium. Recurrence (relapse) is the tendency of the tooth to return to its initial position before orthodontic treatment. Central diastema is a malocclusion with a high recurrence rate after orthodontic treatment, some of its recurrence is associated with an abnormal labial frenulum. Edward's (1977) found that 84% of diastema recurrences showed a strong correlation with labial frenulum abnormalities. Kumar et al's study, which consisted of correction of central diastema, most patients underwent surgical correction including frenectomy. Huang and Creath, stated that effective diastema treatment requires surgery to correct the underlying etiology before orthodontic treatment is performed.^{1,3,10,11,12}

Frenectomy is a necessary action on the attachment of a high frenulum in order to improve aesthetics because there is a central diastema. Frenectomy is distinguished by frenotomy depending on the surgical procedure performed. Frenectomy is the removal of the whole frenulum including attachment to the bone below that is needed to correct the maxillary central diastema. Whereas frenotomy is the act of incising the frenulum, which is to move the position of the attachment of the frenulum to create an attached gingival area between the gingival margin and the frenulum.^{2,4,5,6,13}

Frenectomy can be done by conventional techniques using a scalpel. This technique was introduced by Archer (1961) and Kruger (1964), which is recommended for cases of deviant central diastema and for removing muscle fibers connecting the orbicularis oris with the palatine papillae. This technique is a frenectomy with excision, which includes interdental tissue, palatine and frenulum papillae.⁴

In this case, frenectomy is done using the 2 clamp technique, a modification of the conventional technique, which does not cause wounds that extend to the lip mucosa, this is due to the lateral pulling of the orbicularis oris to the clamp. This method can reduce bleeding and the width of the wound that occurs when doing frenectomy with conventional techniques.

Surgery without causing a lot of bleeding will have a positive psychological impact on the patient and the operator who handles it. The operator will be more calm and comfortable in cleaning fibrous tissue from the frenulum. Besides minimizing the formation of scar tissue, providing good gingival color and without the formation of anesthetic scars. This technique is easy to do and provides excellent aesthetic results. Currently surgical procedures in the field of dentistry use more lasers.^{5,14,15}

CONCLUSION

The success of the crown lengthening procedure is not only supported by surgical techniques, but also supported by the condition of other structures around the gingiva such as the location of the frenulum. In the anterior region where esthetics are important, crown lengthening procedures combined with frenectomy can be a promising choice for patients.

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