



## Research article

# Parallelling Technique for Frenectomy to Prevent Black Triangle in Pre-Orthodontic Patients: A Case Report

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## 1. Introduction

Aesthetics are the main reason to improve appearance, personality, and self-confidence when smile. Smile harmonization is often associated with the teeth' size and gingival tissue, one of which is influenced by the attachment of the frenulum [1]. The superior labial frenulum is a fold of fibro-mucosal tissue attached to the lips above the mucogingival junction, the gingival barrier, and can even extend to the interdental papillae and penetrate to the palatine papillae [2]. Frenulum also has a dynamic structure, can

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change during the growth period, and develops in various shapes and positions, such as thick, thin, and broad [3].

The normal frenum attachment lies at the apical free gingival margin and ends at the mucogingival junction. Clinically, an abnormal frenum attachment can be detected by the blanch test, mainly by pulling the upper lip to observe the movement of the papillary margin and holding it until the area becomes ischemic [4]. Abnormal attachment of the superior labial frenulum indicates a frenectomy if this condition causes pathological conditions such as retraction of the gingival margin so that there is a risk for inflammation and recession. Besides that, it can cause diastema on central incisors, which are complained of disturbing appearance. If left untreated, the frenum attachment can cause relapse after orthodontic treatment [3,4].

Frenectomy is a procedure to remove the frenulum's attachment until it attaches to the underlying bone. The frenectomy procedure can be performed in several ways, namely conventional techniques using a scalpel, electrosurgery, or laser [5]. Conventional frenectomy techniques involve excision of fibers, interdental papillae, and fiber detachment from the alveolar bone to the palatine papilla, resulting in delayed healing, loss of interdental papillae, and scarring [6]. Modifications to conventional techniques using scalpels have been developed to deal with various complications, one of which is the parallel technique. This case report describes the steps of frenectomy treatment with the parallel technique before orthodontic treatment.

## 2. Case Report

A 15-year-old patient came to the Periodontics Clinic of the Gadjah Mada University Dental and Oral Hospital (RSGM UGM). Prof Soedomo complaining of a gap in the upper front teeth that affected the patient's self-confidence. The patient has never consulted a dentist. At the first visit, the patient came with his parents. According to parental information, the patient had no history of systemic disease or allergies. On clinical examination of teeth 11 and 21, the sulcus depth was 1 mm, and found a central diastema with a thin frenum attachment and extended to penetrate the palatine papilla with a blanch test (+). Radiographic examination revealed a V-shaped radiolucent area in the incisive foramen. Based on the examination results, a diagnosis was made that the patient had an aberrant frenum in the superior labial frenulum with the characteristics of a thin frenulum and the type of penetration to the palatine papilla (Figure 1). The initial phase was carried out at the first visit, specifically dental health education, scaling root

planing, and instructions for control. Instructions for oral hygiene, scaling, and root-planing were carried out.



**Figure 1:** Preoperative frenum attachment, visible penetration of the frenulum to the palatine papilla a) left side view; b) front view; c) right view; d) palatal appearance.

At the second visit, the condition of the oral cavity was re-evaluated. OHI is good; PCR is 10.1%, so it has fulfilled the requirements for surgery. Before the action is taken, the patient and parents explained the steps to be taken and the action risks. Patients were asked to sign an informed consent.

## 2.1. Parallel technique frenectomy surgical procedure

Patients were asked to rinse their mouth with 0.2% chlorhexidine digluconate solution before surgery. Subsequently, asepsis and infiltration anesthesia was performed using Articaine hydrochloride 4% and 1:100,000 Epinephrine. The upper lip is retracted to tighten the superior labial frenulum. An incision was made on both sides of the ridge frenulum with a blade #11 followed by a blunt dissection using a raspatorium to release the connective tissue attachment to the bone in the area (Figure 2).

The incised frenum is removed by making a horizontal incision parallel to the lip mucosa, continuing until the frenum is attached to the palatal region (Fig. 3). Bleeding control was carried out using gauze and irrigated with NaCl solution.

The wound was sutured with interrupted 6-0 nylon sutures to achieve primary closure along the length of the wound (Figure 4), followed by applying a periodontal dressing.

We gave medication to patients in the form of 500 mg of amoxicillin for seven days to prevent potential infection, 500 mg of Mefenamic Acid if necessary, and gargling twice a day with 0.2% Chlorohexidine for two weeks. Post-surgical instructions were verbally given to the patient, including avoiding hot, sour, spicy, and complex foods and drinks in the next few days, motivating the patient to maintain oral hygiene. Wound healing



**Figure 2:** The incision on both sides of the frenulum ridge.



**Figure 3:** after excision of the aberrant frenulum.

evaluation was carried out one week after the procedure and suture removal (Figure 5). At two weeks (Fig. 6) and one month (Fig. 7) after the procedure, evaluation was carried out to see a shift in the attachment of the frenulum that was seen at the mucogingival junction, and the scar appeared to have healed without scarring.



**Figure 4:** Wound closure with suturing.



**Figure 5:** Clinical appearance one week after frenectomy.



**Figure 6:** Clinical appearance two weeks after frenectomy.

### 3. Discussion

Each conventional method of using a scalpel has its advantages and disadvantages. The parallel technique has the advantage of minimizing wound area, reducing bleeding, and preventing scar formation after frenectomy. Other conventional techniques that can be done are incision below the clamp, z plasty, Miller's, and V-Y plasty [4]; apart



**Figure 7:** Clinical appearance one month after frenectomy. Patients in the stage of orthodontic treatment.

from a scalpel, a frenectomy can also be performed with electrocautery and laser. Electrosurgery and laser techniques require expensive instrumentation and require good precision and control in applying the instrument, so the conventional technique using a scalpel is preferred [7, 8].

Complications can arise with conventional techniques in frenectomy, including wide incisions that cause excessive bleeding during surgery and create discomfort. In the conventional technique, by placing the clamp parallel to the depth of the vestibule and near the lip mucosa, then an incision is made under the hemostat, that the incision under the hemostat will not make the lip mucosa wide open, but cutting the rest of the frenulum extends to the palate causes loss of the interdental papilla, which results in the loss of the interdental papilla. When orthodontic treatment is performed, the black triangle results from the procedure, making it unaesthetic[9].

Modifications to conventional techniques using scalpels have been developed to deal with various complications, one of which is the parallel technique. This technique is recommended for diastema patients with a thin frenulum type and to remove the fibers that connect the orbicularis oris muscle to the papilla. Another advantage of this technique is a lower degree of postoperative pain and reducing patient discomfort caused by functional complications after frenectomy, such as speech disorders [10].

In the conventional technique, the frenectomy procedure is performed by clamping the frenulum using a hemostat and then incising the tissue above and below the hemostat to create a sizeable rhombus-shaped wound. It is not uncommon to cause profuse bleeding and primary closure wounds that are too large. The parallel technique is a modification of conventional techniques to overcome the shortcomings of conventional techniques. Two parallel incisions are made on the side of the ridge frenulum to reduce the removal of excess mucosal tissue, followed by blunt dissection of the muscle fibers to remove attachments and reduce the likelihood of relapse [10].

Primary closure is possible because the wound produced by a thin parallel incision along the frenulum is not exhaustive (Fig. 3). Minimal bleeding with good esthetic results

in this case, apart from being obtained from primary closure, was also obtained due to less removal of the gingival and mucosal tissue (Fig. 7), so this technique is considered appropriate to be used in overcoming the frenulum attachment which is thin and extends to the papilla palatine. It is in line with the case report of Chandulall et al. [10], who stated that the parallel technique has advantages in reducing post-frenectomy pain and discomfort caused by the small wound shape and primary closure. In this case, the parallel technique is easy to perform because the frenulum is narrow and the attachment is thin.

## 4. Conclusion

Parallel frenectomy is a suitable technique for attaching a thin frenulum that extends to the palatine papilla. In this case, it appears that the resulting wound is minimal, bleeding is minimal, no scar tissue is formed and no loss interdental papilla.

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