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Submission date: 19-Jun-2024 07:34AM (UTC+0700)

Submission ID: 2404997542

File name: 17530-50730-1-SM_2__Frenektomi.pdf (124.13K)

Word count: 1902

Character count: 10887

MAXILLARY FRENECTOMY IN PEDIATRIC PATIENT USING ELECTROCAUTERY TECHNIQUE : REPORT OF 2 CASES

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ABSTRACT

Background : The frenum is defined as a mucous membrane fold that attaches the lip and the cheek to the alveolar mucosa, the gingiva and the underlying periosteum. The unusual frenum need treated by frenectomy or by frenotomy procedure. Conventional technique of frenectomy carries the risks of surgery like bleeding and patient compliance with favorable healing. Electrocautery technique provide bloodless area and clear view of the operative field. **Case** : The present article is a report of two cases of frenectomy using electrocautery technique. **Case management** : Maxillary frenectomy of 2 patients was carried out using electrocautery technique after the area was anesthetized with 4% articaine. Continuous saline irrigation was given while using the electrocautery. Minimal bleeding was seen during the procedure. No sutures were placed after the treatment. One week recalled visit showed almost complete healing in both cases. No discomfort was complained by patient during and after the treatment. **Conclusion** : Electrocautery is recommended for performing frenectomy due to its effectiveness and safety. The procedure causes light bleeding and does not have postoperative complications. The use of electrocautery in frenectomy provides a reduction in work time as well as greater comfort and safety for the patient and dentist.

Keywords : Frenectomy, Frenum, Pediatric Patient

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INTRODUCTION

A frenum is a fold of mucous membrane, usually with enclosed muscle fibers, that attaches the lips and cheeks to the alveolar mucosa or gingiva and underlying periosteum. A frenum becomes a problem if the attachment is too close to the marginal gingiva. Tension on the frenum can pull the gingival margin away from the tooth.¹

The abnormalities of its size and location would cause the diastema of the front incisors, the limitation of the lip, speech and chewing, aesthetic problems and so on which used to solve with surgical excision.¹ Abnormal attachment of the upper labial frenum is one of the main causes of excessive space between maxillary central incisor space. When the upper lip is pulled, it causes the gingiva papilla to whiten, and when the maxillary midline space is larger than 2 mm, it rarely closes naturally with growth and development.²

The treatment modality for such an aberrant frenum is frenotomy or frenectomy. *Frenectomy* and *frenotomy* refer to surgical procedures that differ in degree. Frenectomy is complete removal of the frenum, including its attachment to underlying bone, and it may be required in the correction of an abnormal diastema between the maxillary central incisors. Frenotomy is

relocation of the frenum, usually in a more apical position.^{1,3} Frenectomy of the maxillary midline frenum may be related to presence or prevention of midline diastema formation, prevention of post orthodontic relapse, esthetics, and psychological considerations.⁴⁻⁸

Frenectomy can be accomplished either by the routine scalpel technique, electrosurgery or by using lasers. The scalpel technique can be performed by three ways- the simple excision technique, the Z-plasty technique, the VY-plasty technique or by a local vestibuloplasty with secondary epithelialisation.⁹⁻¹¹ The conventional technique comprises excision of the frenum by using a scalpel. Conversely, it carries the routine risks of surgery like bleeding and patient compliance with favorable healing.¹² Electrosurgery has been used since 1928 in dentistry for soft tissue procedures. The main advantage of the electrocautery is coagulative effect that provide bloodless area and clear view of the operative field. With any device that creates thermal energy to cut or ablate tissue, heat may be dissipated by diffusion into adjacent tissues (conduction), or into the circulating blood (convection).¹³

CASE REPORT

CASE 1

An 8-year-old female patient was referred to the pediatric dentist with her mother. Her initial chief complaint was tilted of her front teeth. Clinical examination showed the fibres of maxillary frenum was cross the alveolar process and extend up to palatine papilla accompanied by central incisor diastema and tilted of right central incisor. Patient had oligodontia with the absence of permanent germs of 17, 15, 24, 25, 27, 35, 34 and 45 (Fig. 1). Gingival tissues were healthy and revealed no significant medical problems or related allergies. Alveolar bone architecture was normal.

Informed consent was obtained after discussing with the parents. Informed consent includes relevant information regarding assessment, diagnosis, nature and purpose of proposed treatment, and potential benefits and risks of the proposed treatment, along with professionally-recognized or evidence-based alternative treatment options—including no treatment – and their risks.

No medication was prescribed to the patient before the procedure. Topical anaesthetics (Precaine®, USA - 8% lidocaine + 0.8% Dibucaine), were applied and infiltration anaesthetics (Orabloc®, Russia - Articaine hydrochloride 4% and epinephrine 1:100.000) injected to the mucobuccal fold. Frenectomy procedure of the maxillary frenum was performed using electrocautery after local anaesthetics. Muscle fibers were separated using loop electrode (Fig. 2). Coagulation was achieved using ball electrode. Continuous saline irrigation was given while using the electrocautery. Any underlying adhesions to the periosteum was removed, and the remnants of the remaining tissue were removed using sterile gauze dampened with the saline. No sutures were placed after electrocautery treatment (Fig. 3).



Figure 1. Papillary type of maxillary frenum



Figure 2. Frenum excised using electrocautery



Figure 3. Post-operative view



Figure 4. One week post-operative view

Minimal bleeding was seen during the procedure and hence we were able to work in a clear field. The maxillary frenectomy took around 10 minutes and the patient experienced no discomfort during the procedure.

The patient was advised to take analgesic whenever needed and recalled after 24hrs for post-operative observation. On recalled visit examination, initial epithelialization can be seen and patient had no post-operative bleeding in the first 24 hours. The wound was clean and showed no signs of infection. The patient was attend the next visit after a week from the surgery. Patient showed no signs of discomfort and the healing was almost complete (Fig.4).

CASE 2

A 7-years-old female patient was referred to pediatric dentist with initial chief complaint was spacing between the upper front teeth, which not aesthetically pleasing to her. The patient medical history was non contributory and there did not any deleterious habits. On intraoral examination, the frenal attachment was found to be papillary between 11 and 21 region. This attachment giving positive tension test. Frenectomy procedure was planned. The patient and her parents was informed about the treatment. After obtaining consent from the parents, maxillary labial frenectomy was performed using electrocautery. After administering local anesthesia with a solution of articaine 4%, a hemostat was inserted into the depth of the vestibule to grasp the frenum then two incision using loop electrode were made as in the classical frenectomy technique, above and below the hemostat. Continuous saline irrigation was given during the procedure. The triangular tissue of the labial frenum was then removed. No sutures were placed after electrocautery treatment.

Only light bleeding was seen during the procedure. The patient feel comfort and no pain during the procedure. The frenectomy work time approximately 10 minutes. The patient was advised to take analgesic whenever needed and recalled after 24hrs for post-operative observation. There were no any postoperative complication. Initial epithelization was seen on 24hrs recalled examination and the healing was almost complete on 7 days recalled examination.



Figure 5. Papillary frenal attachment



Figure 6. Frenectomy using electrocautery



Figure 7. Post-operative view



Figure 8. 7 days post operative view

DISCUSSION

The frenum is a mucous membrane fold that attaches the lip and the cheek to the alveolar mucosa, the gingiva, and the underlying periosteum.¹⁴ There are several frenum that are usually present in a normal oral cavity, most notably the maxillary labial frenum, the mandibular labial frenum, and the lingual frenum.¹⁵ Labial frenal attachments are thin folds of mucous membrane with enclosed muscle fibres originating from orbicularis oris muscle of upper lip that attach at the lips to the alveolar mucosa and underlying periosteum.¹⁶ The primary function of frenum is to provide stability to the upper and lower lips and the tongue.¹⁷

Based on the extension of attachment of the fibres, frenum are classified as : Mucosal –when the frenal fibres are attached upto mucogingival junction; Gingival – when fibres are inserted within attached gingiva; Papillary – when fibres are extending into interdental papilla; Papilla penetrating – when the frenal fibres cross the alveolar process and extend up to palatine papilla.¹⁷ Abnormal or aberrant frenum are detected visually, by applying tension over it to see the movement of papillary tip or blanching produced due to ischemia of the region.¹⁸ Clinically, papillary and papilla penetrating frenum are considered pathological and are commonly termed “High frenal attachment”. They have been found to be associated with loss of papilla, recession, diastema, difficulty in brushing, malalignment of teeth and in psychological disturbances to the individual.¹⁹

The papillary and papilla penetrating type of frenum attachments encroach the marginal gingiva leading to the distension of the gingival sulcus thereby accumulating plaque and increases the progression of gingival recession. This clinical condition requires surgical intervention using frenectomy or frenotomy procedure. Frenectomy is the complete removal of the frenum, including its attachment to the underlying bone whereas frenotomy involves relocation of the frenal attachment.^{1,3,20}

Frenectomy can be performed using conventional scalpel technique, with electrocautery or with lasers. The conventional technique was introduced by Archer (1961) and Kruger (1964) involves the excision of the frenum by using a scalpel. The advantages of the scalpel technique is that it is cost effective and decrease chances of recurrence, but this technique requires sutures and followed by postoperative bleeding, pain or swelling.¹⁰ In the modern era of periodontal plastic surgery, more conservative and precise techniques are practiced to create more functional and aesthetic results. Though lasers have marked the beginning of their use in soft tissue management, electrosurgery units are cheaper than diode lasers.²¹

The advantages of electrosurgery include permitting adequate coagulation of tissue, controlling hemorrhage, increasing access to difficult-to-reach areas healing discomfort and scar formation is very minimal,

chair time and operator fatigue are reduced, the technique is pressure less and precise. Disadvantages of electrosurgery are cost of the electrosurgical unit is far greater than the cost of a scalpel. These procedures also require extensive training as well as skillful technique and patient management, especially in the neonate.^{21,22} Bhullar study found that no statistically significant difference of scalpel technique and electrosurgery in VAS scores and Healing Index was found when compared at 1 week and 1 month.²³ The abnormality of the labial frenum is closely related to the space between maxillary central incisors. An aberrant frenum can be removed by any of the techniques that have been established in the literature. A functional and an aesthetic outcome can be achieved by a proper technique selection, based on the type of the frenum attachment.

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