

HIGH ABERRANT LABIAL FRENUM AND ITS DIFFERENT TREATMENT MODALITIES: A CASE SERIES

ABSTRACT

The frenum is a mucous membrane fold that attaches the lip and cheek to the alveolar mucosa, gingiva, and underlying periosteum. It may jeopardize the gingival health when it is attached too closely to the gingival margin, either due to interference in plaque control or due to a muscle pull and may cause midline diastema resulting in aesthetic problems. The management of such an aberrant frenum is accomplished by performing frenectomy or frenotomy. The present case series describes 3 cases of high aberrant frenum managed by different treatment modalities.

Key words: Frenum, Gingival recession, Frenectomy and Frenotomy.

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Date of Submission : 13/4/18

Date of Acceptance : 22/5/18

INTRODUCTION

A FRENUM is a fold of mucous membrane, usually with enclosed muscle fibers, that attaches the lips and cheeks to the alveolar mucosa and/or gingiva and underlying periosteum. It is a dynamic structure which changes in shape, size and position during different stages of growth and development.¹

Contents of frenum include variable amounts of loose connective tissue with elastic and dense collagen fibres, fat cells, occasionally acini of mucous producing salivary glands, muscle fibres, mucogingival junction.²

Classification

The labial frenal attachments have been classified as mucosal, gingival, papillary and papilla penetrating, by Placek et al (1974).³

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.

The presence of an aberrant frenum is one of the aetiological factors responsible for diastema between the maxillary central incisors in adults, which is considered as an aesthetic problem. It may cause gingival recession, jeopardizing the gingival health, 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.⁴

The abnormal frena are detected visually by applying tension over the frenum to see the movement of papillary

tip or the blanch which is produced due to ischaemia in the region. The frenum is characterized as pathogenic when it is unusually wide or when there is no apparent zone of the attached gingiva along the midline or the interdental papilla shifts when the frenum is extended.^{3,4}

Indications for surgical removal of frenum¹

- 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 gingival recession and a hindrance in maintaining the oral hygiene.
- An aberrant frenum with an inadequately attached gingiva and a shallow vestibule is seen.
- A frenum, which is unsightly, being visible as a pendulous piece of tissue in the midline of the upper lip.
- When oral hygiene is hindered by shallow vestibule caused by high frenum attachment.
- When lingual frenum interferes with speech.

The aberrant frena can be treated by frenectomy or frenotomy procedures. Frenectomy is the complete removal of the frenum, including its attachment to the underlying bone, while frenotomy is the incision and the relocation of the frenal attachment.⁴ Frenectomy can be performed either by the conventional scalpel technique or by using electrocautery and lasers.

This case series presents three cases in which different techniques were used to treat aberrant labial frenum.

CASE SERIES

CASE 1: A female patient aged 30 years reported to the Department of Periodontology And Oral Implantology, Sri Guru Ram Das Institute Of Dental Sciences And Research with gingival recession in lower anterior teeth region since 2-3 yrs. She was otherwise healthy with a non contributory medical history.

Intraoral examination revealed high attachment of lower labial frenum, extended into the marginal gingiva. The classical (scalpel) frenectomy procedure was planned to



Figure 1a: Pre-operative view



Figure 1b: Bloody field post incision with Classical Technique



Figure 1c: Sutures and periodontal pack placed



Figure 2a: Pre-operative view



Figure 2b: Bloodless field post incision with Electrocautery Technique



Figure 2c: Only periodontal pack placed



Figure 3a: Pre-operative view



Figure 3b: Bloodless field post incision with Diode Laser Technique



Figure 3c: Only periodontal pack placed

remove the frenum.

After anaesthetising the area using 2% lignocaine with 1:2,00,000 adrenaline, frenum was engaged with a haemostat which was inserted into the depth of the vestibule and incisions were placed on the upper and undersurface of the haemostat until the tissue became free. The triangular resected portion of the frenum was removed along with the haemostat. A blunt dissection was done to relieve the fibrous attachments. The edges of the wound were sutured using 3-0 black silk sutures. The area was covered with a periodontal dressing (COE-PAK™ GC America). The pack and the sutures were removed 1 week postoperatively. (Figure 1a-c).

CASE 2: A 35 year old female patient reported to the Department of Periodontology And Oral Implantology, Sri Guru Ram Das Institute Of Dental Sciences And Research with gingival recession and spacing in lower anterior teeth for last 3-4 yrs. Medical history was non-significant.

On clinical examination, Tension test was positive in the mandibular arch w.r.t labial frenum leading to high attachment of lower labial frenum and spacing between the anterior teeth. It was decided to excise the frenum by using ART-E1 electro surgery unit (Bonart Co. Ltd, Taipei country, Taiwan).

The area was anesthetized using Topical anesthesia. Two incisions using the electrode were given and continuous saline irrigation was given while using the electrocautery. The triangular tissue of labial frenum was then removed and it was made free and the area was covered with a periodontal dressing (COE-PAK™ GC America) which was removed after 1 week. (Figure 2a-c)

CASE 3: A 32 year old female patient reported to the Department of Periodontology And Oral Implantology, Sri Guru Ram Das Institute Of Dental Sciences And Research with gingival recession and inability to maintain oral hygiene in lower anterior teeth for last 2-3 yrs. There was no relevant medical, dental or drug history.

Intraoral examination revealed high attachment of lower labial frenum and it was decided to use 810 nm diode laser (Picasso Lite Diode Laser, AMD GROUP LLCTM) at power setting of 1.8 w for the excision of the frenum.

The area was anesthetized using Topical anesthesia. Fiber tip of laser was used in a contact mode and moved, in a paint brush stroke, from the base to the apex of the frenum thereby excising it. Any remnant fiber over the periosteum was removed by gently sweeping the laser tip and the ablated remnant tissue was cleaned with gauze soaked in saline. The area was covered with a periodontal dressing (COE-PAK™ GC America). Patient was recalled after one week to remove the dressing. (Figure 3a-c)

DISCUSSION

Patients who undergo conventional frenectomy procedures using scalpel often experience postsurgical pain and discomfort. Also, it is a more intrusive surgical procedure

involving blood loss, wide surgical wound and suturing. The sutures also contribute to the discomfort postoperatively since they interfere with regular functions such as speech and intake of food.⁵ Other disadvantages include excessive bleeding, inadequate visibility caused by blood in the operating field and non sterilizing incision cut.⁶

In the era of periodontal plastic surgery, more conservative and precise techniques are being adopted to create more functional and aesthetic results.⁴ The soft tissue laser and electrocautery are now viable alternatives to the scalpel in soft tissue surgeries.²

Laser is a relatively new and modern technology developed by Maiman, 1960.⁷ Lasers, such as the neodymium doped:yttrium aluminum garnet (Nd:YAG), carbon dioxide (CO₂), and erbium-doped (Er:YAG) lasers, enable minimally invasive dentistry for soft tissue procedures. In the present case report, Diode laser is used which characteristically uses a blend of gallium, arsenide and other elements such as aluminium and indium. Diode lasers are semiconductor and they are indicated for soft tissue surgeries as their wavelength approximates the absorption coefficient of pigmented tissues containing hemoglobin, melanin, and collagen chromophores.⁸

Laser treatment has served as an alternative or adjunctive treatment to more conventional therapies because of its many advantages including relatively bloodless surgical and postsurgical event; the ability to precisely coagulate, vaporize, or cut tissue; sterilization of the wound site; minimal swelling and scarring; no suturing in most cases; little mechanical trauma; reduction of surgical time; decreased postsurgical pain; and high patient acceptance.⁸ Laser causes sealing of small blood and lymphatic vessels resulting in haemostasis and reduced postoperative oedema. Target tissues are also disinfected as a result of local heating and production of an eschar layer and a decreased amount of scarring due to decreased post-operative tissue shrinkage. Consequently, the use of sutures is eliminated. Also, soft tissue diode lasers have an excellent incision performance with a cutting depth of 2-6mm.⁷ It is hypothesized that decreased pain perception after the use of laser may be due to the protein coagulum that is formed on the wound surface, thereby acting as a biologic dressing and sealing the endings of sensory nerves.⁸

Though lasers have marked the beginning of their use in soft tissue management, electro surgery units are far less expensive than the least expensive diode lasers.⁴ There are two basic types of electro surgical units that can be used in dentistry: Monopolar is one in which a single electrode exists and the current travels from the unit down in a single wire to the surgical site. The patient must be grounded with a pad placed behind the patient's back. Heat is produced when the electrode contacts the tissue and due to pain that is produced, anesthetic must be used. Bipolar is one in which two electrodes are placed in very close proximity to each

other. Bipolar units are more expensive than diode lasers and the electrical current flows from one electrode to the other, thus eliminating the need for grounding pad. Bipolar units, because of the two wires, create less of a precise cut than the monopolar or diode laser.⁴

Advantages of electrocautery are immediate and consistent hemostasis, tip is self-disinfecting and minimum postoperative pain and swelling and scarring. Like laser, electrocautery causes coagulation and sealing of small diameter blood vessels and lymphatics resulting in blood free surgical field and minimum postoperative swelling. A reduction in postoperative pain is also achieved as a result of obliteration and sealing of free nerve endings and dendrites.⁶

In the present case report, patient treated with scalpel technique experienced more pain, bleeding and postoperative swelling and discomfort compared to those treated with laser and electrocautery.

CONCLUSION

An aberrant frenum can be removed by any of the modification techniques but a functional and aesthetic result can be achieved by proper technique selection based on the type of frenal attachment. Both electrocautery and diode laser works well for simple cutting of oral soft tissues. Lasers have more advantages than electrocautery as it can be used in close proximity to bone and better wound healing. Laser and electrocautery produce thermal artifacts that may interfere with histologic interpretation and delayed tissue healing.

Despite these advanced treatment modalities like electrocautery and laser, scalpel has been considered gold standard cutting tool in terms of precise incisions and faster healing at much lower cost.

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