

Frenectomy Using Electrocautery: A Case Series

Sneha Shah¹ Vandana Rathwa² Monali Shah^{3*} Deepak Dave⁴

¹ Post Graduate Student, Department of Periodontics, K.M.Shah Dental College & Hospital, Vadodara, Gujarat, India.

² Reader, Department of Periodontics, K.M.Shah Dental College & Hospital, Vadodara, Gujarat, India.

³ Professor, Department of Periodontics, K.M.Shah Dental College & Hospital, Vadodara, Gujarat, India.

⁴ Professor and Head, Department of Periodontics, K.M.Shah Dental College & Hospital, Vadodara, Gujarat, India.

ABSTRACT

Background: While performing frenectomy, conventional scalpel techniques have their own traditional drawbacks. To overcome them, we have novel techniques like electrocautery and lasers, which are increasingly being used in routine periodontal practice. However, there isn't sufficient evidence supporting the use of electrocautery in frenectomy. Aim of the study is to compare the conventional scalpel technique and the electrocautery technique for frenectomy procedure.

Material & Method: Two cases were selected. For the 1st case, electrocautery was used, while for the 2nd case, conventional scalpel technique was used for frenectomy. For both the patients, similar clinical parameters were assessed at baseline, 1 week and 1 month.

Result: Clinically, both the cases showed similar improvement post 1 week as well as post 1 month.

Conclusion: This case series shows equivalent results for both the techniques, with slight benefit of the electrocautery over the other, in terms of patient comfort.

Keywords: Frenectomy, Electrocautery, Laser.

INTRODUCTION:

A frenum is a mucous membrane fold containing muscle and connective tissue fibres, which attach the lip and the cheek to the alveolar mucosa, the gingiva and the underlying periosteum¹.

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 problem². The frena 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 pull¹.

The abnormal frena are detected visually by applying tension over the frenum to see the movement of the papillary tip or the blanch, which is produced due to ischemia 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.

The labial frenal attachments have been classified by Placek et al in 1974³ Mucosal, Gingival, Papillary, Papillary penetrating. Other authors have classified the maxillary median labial frena by describing the conditions of anatomical normality



Received: May. 22, 2013; Accepted: June. 20, 2013

*Correspondence: Dr. Monali Shah

Department of Periodontics, K.M.Shah Dental College & Hospital, Vadodara, Gujarat, India.

E-mail: monalishah2010@yahoo.com

and abnormality and identifying clinical scenarios for which surgical intervention may be indicated⁴.

1. Anomalous frenum associated with inflamed gingiva, resulting from poor oral hygiene.
2. Anomalous frenum associated with gingival recession.
3. Maxillary frenum associated with a diastema after complete eruption of the permanent canines.
4. Abnormal and/or anomalous maxillary frenum (Class III or IV), resulting in the presence of a diastema during mixed dentition.
5. Anomalous mandibular frenum with high insertion, causing the onset of gingival recession.

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. Frenectomy can be accomplished either by the routine scalpel technique, electrosurgery or by using lasers.



Fig 1(a-d): a. Papillary frenal attachment. b. Bloodless field immediately after surgery. c. Post one week healing. d. Post one month healing.

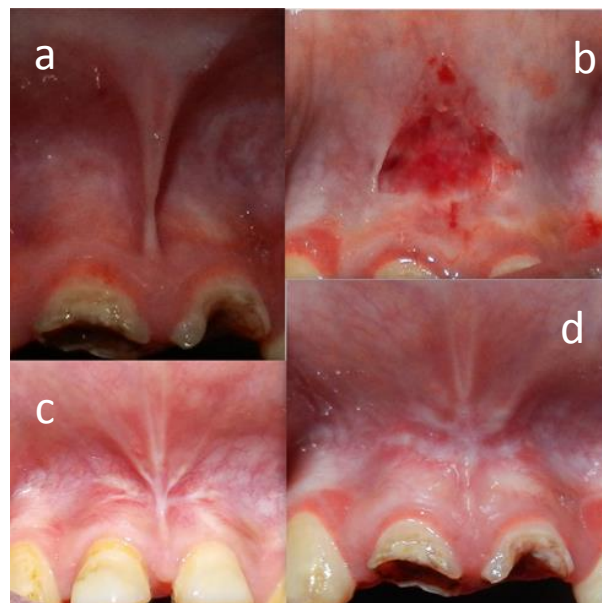


Fig 2(a-d): a. Papillary frenal attachment. b. Bloody field post incision with classical scalpel technique. c. Post one month healing. d. Post one week healing.

The conventional scalpel technique involves the routine risks of surgery like bleeding and poor patient compliance. Hence, researchers have advocated the use of an electrocautery probe due to its efficacy and due to the safety of the procedure, mild bleeding and the absence of postoperative complications. Electrosurgery (diathermy) is the delivery of radio frequency (RF) energy to tissue for a desired clinical effect, such as cutting and coagulation [Pearce 1986]. However, it is associated with certain complications which include burns, the risk of an explosion if combustible gases are used, interference with pacemakers and the production of surgical smoke. These complications have not been reported with the new improvement in the electro surgical techniques, like the Argon Beam Coagulation (ABC)⁴.

Other techniques used for frenectomy are Miller's technique, V-Y Plasty, Z Plasty.

Case series

Case 1

The first case was of a 23-year old male who reported to Dept. of Periodontics, KMSDCH, Baroda, India, with the chief complaint of a midline diastema between the maxillary central incisors. The cause of the diastema appeared to be an

Table 1: Parameters at baseline, One week and One month post-surgery.

	Case 1	Case 2
Baseline		
Type of frenal attachment	Papillary	Papillary
Tension test	+ve	+ve
Width of attached gingiva	Inadequate	Inadequate
Vestibular depth	Adequate	Inadequate
Diastema	Present	Present
Oral hygiene	Fair	Poor
Colour	Pale pink	Reddish pink
Treatment done	Electrocautery	Scalpel
Re-evaluation at 1 week		
Swelling	Absent	Absent
Colour	Reddish pink	Pale pink
Re-evaluation at 1 month		
Frenum location	Mucosal	Mucosal
Tension test	-ve	-ve
Width of attached gingiva	Adequate	Adequate
Vestibular depth	Adequate	Adequate
Colour	Pale pink	Pale pink
Oral hygiene	Good	Good

abnormal frenal attachment. An appropriate medical history was obtained. The diastema was created due to a wide and abnormal frenal attachment, which was classified as papillary between the 11 & 21 region (Fig. 1a), giving positive tension test. The width of attached gingiva was inadequate in this region. For him, the electrocautery technique was used for performing frenectomy.

Case 2

The second patient was a female aged 18 years, with the chief complaint of poor aesthetics in the upper anterior region. The frenal attachment was found to be papillary between the 11 & 21 region (Fig. 2a), giving positive tension test. It also hampered the oral hygiene maintenance in that area. For her the classical frenectomy approach (Archer, 1961 and Kruger, 1964) with scalpel was used.

Armamentarium and procedure: Electrode (case 1), hemostat, gauze sponges, saline, L.A syringe, scalpel blade no.15 (case 2), 4-0 black silk sutures, suture pliers, scissors.

Patients were told about the procedure and informed consents were taken. They were administered 2% xylocaine with adrenaline. Infiltration was given on the labial aspect and on the palatal aspect near the base of the papilla.

Technique: Hemostat was used to elevate tissue, hold it tight and was inserted into the depth of the vestibule. The ART-E1 electrosurgery unit was used (for case 1). The setting on the cutting electrode was set with 4 RF/2MHz, power supply of 230±10% 50/60Hz, 0.9A 210 VA. The output power was kept 38 watts rms ±5% (Compared with 18 watts from a standard Valley Lab Electrocautery). The working frequency was adjusted to 1.5 MHz±5%. Two incisions using the electrode (case 1) or scalpel (case 2) were made as in the classical frenectomy technique, above & below the hemostat. Continuous saline irrigation was given while using the electrocautery. The triangular tissue of labial frenum was then removed for both the cases with the hemostat, and it was made free. For scalpel technique, a blunt dissection was done on the bone to relieve the fibrous attachment, following which, the edges of the diamond shaped wound were sutured using 4-0 black silk by interrupted sutures. No suturing was required for case 1.

Follow up: The patient was seen one week after surgery (Fig. 1c, 2c). The sutures were removed 1 week post-operatively (for case 2). Recovery was uneventful. A four week follow up was also completed with uneventful healing for both the cases (Fig. 1d, 2d). By this time the marginal gingiva, which was erythematous at the beginning of the study in the 2nd case, had become healthy in relation to 11 & 21. (Table 1)

RESULTS

The outcome of both the surgical procedures showed that both the techniques produced a pleasing aesthetic result. On healing, a wider zone of attached gingiva was obtained. It was color matched with adjacent tissue. Healing was obtained by primary intention. No complication was noted during healing period. Patient's compliance

was also very good for both the cases. The only added advantage in the first case (electrocautery) was bloodless field while operating, which also reduced the patient's discomfort. (Fig. 1b, 2b)

DISCUSSION

Frenectomy can be performed using various techniques like conventional scalpel technique, with electrocautery or with lasers. In the era of periodontal plastic surgery, more conservative and precise techniques are being adopted to create more functional and aesthetic results.

Though lasers have marked the beginning of their use in soft tissue management, electrosurgery units are "far less expensive than the least expensive diode lasers" and hence it can be questioned whether "the advantages of the diode laser are significant enough to compensate for the additional cost"⁵. Also when David et al⁶ compared mucosal incisions made by scalpel, CO₂ Laser, electrocautery, he concluded that, on subjective evaluation of ease of use, constant-voltage electrosurgery scored highest ($p < 0.05$) on a scale of 0 to 4, followed by the CO₂ laser. The speed of incisions and excisions, measured in seconds, was also faster for electrosurgery unit as compared to CO₂ laser. The collateral tissue damage was also less in electrocautery group as compared to laser. Other advantages of it over lasers, are that they require no safety glasses and can remove large amounts of tissue quickly.⁵ Hence till certain extent, we can justify the use of electrocautery over the novel technique of laser in routine practice. There are two basic types of electrosurgical units that can be purchased 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. Amongst both the approaches employed for

frenectomy in the present case series, the electrocautery procedure offered the advantage of minimal time consumption and a bloodless field during the surgical procedure, with no requirement of sutures. The result is in agreement with Devishree et al.⁷. The healing was also comparable with the conventional scalpel technique, without any delay. This is in contrast to the literature suggesting delay in healing, when electrocautery is used^{6,8}. Need to do suturing was eliminated while treating the patient with electrocautery, which also reduced the risk of post-operative infection. Also the patient treated with electrocautery didn't have any pain post operatively, nor did he have any collateral tissue damage, which otherwise is claimed while opting for electrocautery.

CONCLUSION

This case series shows equivalent results for both the techniques, with slight benefit of the electrocautery over the conventional scalpel technique. However, there is a need for further longitudinal studies with larger sample size to establish the exact efficacy of electrocautery technique over the conventional scalpel technique for frenectomy procedure.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Jhaveri H. The Aberrant Frenum. Dr. PD Miller the father of periodontal plastic surgery. 2006:29
2. Huang WJ, Creath CJ. The midline diastema: a review on its etiology and treatment. *Pediatric Dentistry*. 1995; 17:171-9.
3. Karima M, Dibart Serge, Karima Mamdouth. *Practical Periodontal Plastic Surgery*. Germany: Blackwell Munksgaard; Labial frenectomy alone or in combination with a free gingival autograft; p. 53.
4. Cunha RF, Silva JZ, Faria MD. A clinical approach of ankyloglossia in babies: a report of two cases. *J Clin Pediatr Dent*. 2008; 32:277-82.
5. Glenn A et al. The diode laser as an electrosurgery replacement. *C.E. article electrosurgery*, 2013, 6-13.
6. John Liboon et al. A Comparison of Mucosal Incisions Made by Scalpel, CO₂ Laser, Electrocautery, and Constant-Voltage Electrocautery. *Otolaryngol Head Neck Surg* March 1997; Vol. 116; No. 3; 379-385.
7. Devishree et al. Frenectomy: A review with the reports of surgical techniques. *J Clin Diagn Res*. 2012 November; 6(9): 1587-92.
8. Uttam K. Sinha et al. Effects of Steel Scalpel, Ultrasonic Scalpel, CO₂ Laser, and Monopolar and Bipolar Electrosurgery on Wound Healing in Guinea Pig Oral Mucosa. *The Laryngoscope*, February 2003, Volume 113, Issue 2, pages 228-36.