

## CASE REPORT

### A comparison of Frenectomy using Electrocautery and Scalpel Techniques

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#### ABSTRACT:

**Background:** The frenum is defined as a mucous membrane fold which attaches the lip and the cheek to the alveolar mucosa, the gingiva, and the underlying periosteum. The frenum may hamper the gingival health if it is attached too closely to the gingival margin, which can be a result of interference in the plaque control or due to a muscle pull. The management of such an aberrant frenum is treated by performing a frenectomy. The aim of this study was to compare the degree of postoperative pain, such as discomfort and functional complications experienced by patients after two frenectomy operation techniques. **Methods:** Ten patients were selected from outpatient department of Periodontics and Oral Implantology at National Dental College & Hospital, Dera Bassi. Patients were then randomly allotted to group 1 (Scalpel technique) and group 2 (Electrocautery Technique). The clinical parameters were assessed at baseline and 1 month. **Results:** Clinically, both the groups showed similar improvement post 1 week and 1 month postoperatively. **Conclusion:** This study shows equivalent results for both the techniques.

**Key words:** Frenectomy, Electrocautery, scalpel.

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#### INTRODUCTION-

The frenum is a mucous membrane fold that attaches the lip and the cheek to the alveolar mucosa, the gingiva, and the underlying periosteum.<sup>1</sup> There are several frena that are usually present in a normal oral cavity, most notably the maxillary labial frenum, the mandibular labial frenum, and the lingual frenum.<sup>2</sup> 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.<sup>3</sup> The primary function of frena is to provide stability to the upper and lower lips and the tongue.<sup>4</sup>

**Based on the extension of attachment of fibres, frena are classified as<sup>5</sup>:**

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. Abnormal or aberrant frena are detected visually, by applying tension over it to see the movement of papillary tip or blanching produced due to ischemia of the region.<sup>6</sup> Clinically, papillary and papilla penetrating frena 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.<sup>7</sup>

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.<sup>8</sup> Frenotomy is the surgical procedure of choice for upper labial frenum and frenotomy is the preferred surgery for lower labial frenum.

**Various Frenectomy techniques practiced are:**

1. Classical frenectomy by Archer<sup>9</sup> and Kruger<sup>10</sup>
2. Millers technique (unilateral single pedicle flap)<sup>11</sup>
3. Schuchardt Z-plasty<sup>12</sup>
4. V-Y Plasty<sup>13</sup>
5. Frenectomy using electrocautery<sup>14</sup> and
6. Laser – Diode,CO2, Nd:YAG, Er:YAG and other soft tissue lasers.

The most common restriction for frenctomy is patient’s acceptance. The patients usually don’t agree to this surgery as the abnormal frenal attachment doesn’t cause problems in their day to day life.

The purpose of this study was to compare the classical technique and electrocautery technique.

**MATERIALS AND METHODS-**

For this study, subjects with abnormal frenal attachment in the maxillary anterior region were selected from the Out Patient Department of Periodontics, National Dental College and Hospital, Dera Bassi (Mohali), Punjab.

**STUDY DESIGN-**

A total of 10 subjects were selected, and divided into two groups randomly, Group A and Group B

Group A- 5 subjects were treated with conventional surgical technique

Group B- 5 subjects were treated with electrocautery technique

**Frenectomy with Conventional Technique-**

The frenum was held with a pair of haemostat, and the whole band of tissue together with its alveolar attachment was excised with #15 blade. After removing all the fibrous attachments to the underlying periosteum, the wound was closed with sutures. The treated area was covered with a periodontal pack. The pack and the sutures were removed 1 week post-operatively.

**Frenectomy with Electrocautery-**

The frenum was held with hemostat and the electrocautery was used for the excision. 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. But the pack was placed that was removed 1 week post-operatively.

**CLINICAL PARAMETERS-**

**VISUAL ANALOGUE SCALE (VAS)-**

The subjects were asked to separately rate the degree of pain on Visual Analogue Scale (VAS) marking a round on the point given from 0 to 10 .

The distance of this point, in centimetres, from the left end of the scale will be recorded and will be used as VAS score: 0= no pain, 1-3= slight pain, 3.1-6= moderate pain, 6.1-10= severe pain



**HEALING INDEX (HI)<sup>15</sup>-**

Landrey et al healing index was used to assess the healing at 1 week and 1 month.

**Very poor-**

- tissue color (>50% of gingival is red)
- Reponse to palpation- Bleeding
- Granulation tissue- Present
- Incision marging- not epithelaised, with loss of epithelium beyond incision margin
- Suppuration present

**Poor-**

- tissue color ( >50% of gingival is red)
- Response to palpation- bleeding
- Granulation tissue- Present
- Incision marging- not epithelaised, with connective tissue exposed

**Good –**

- tissue color ( >25% and <50% of gingival red)
- Response to palpation- no bleeding
- Granulation tissue- absent
- Incision marging- no connective tissue exposed

**Very good-**

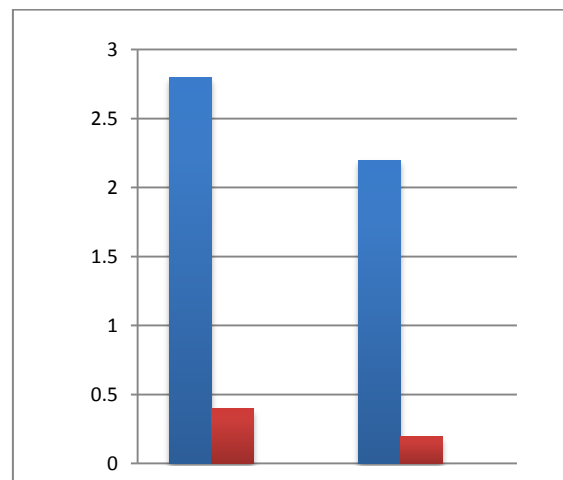
- tissue color ( >25% of gingival red)
- Response to palpation- no bleeding
- Granulation tissue- absent
- Incision margin- no connective tissue exposed

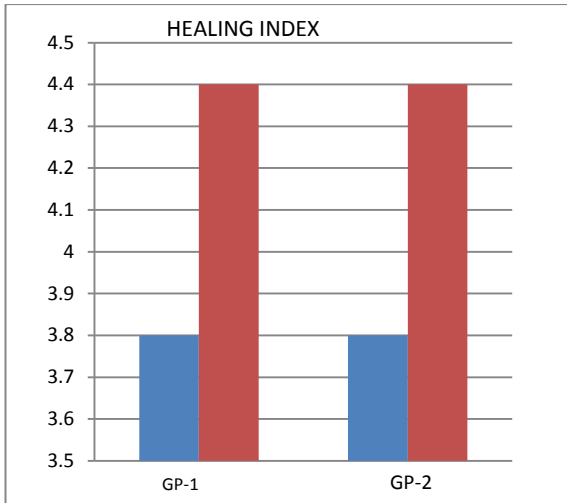
**Excellent -**

- tissue color ( all tissue pink)
- Response to palpation- no bleeding
- Granulation tissue- absent
- Incision marging- no connective tissue exposed

**RESULTS-**

|                               | Scalpel    | electrocautery | p     |
|-------------------------------|------------|----------------|-------|
| <b>VAS baseline</b>           | 2.80±0.837 | 2.20±3.271     | >0.05 |
| <b>VAS 1 month</b>            | 0.40±0.548 | 0.20±0.447     | >0.05 |
| <b>Healing index baseline</b> | 3.80±0.447 | 3.80±0.447     | >0.05 |
| <b>Healing1 month</b>         | 4.40±0.548 | 4.40±0.548     | >0.05 |





No statistically significant difference in VAS scores and Healing Index was found when compared at 1 week and 1 month using Mann-Whitney U Test.

**DISCUSSION**

Frenectomy can be performed using conventional scalpel technique, with electrocautery or with lasers. In the modern era of periodontal plastic surgery, more conservative and precise techniques are practised 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”.<sup>16</sup> Also when David et al<sup>17</sup> 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. Another advantage that electrocautery offers is that there is no need for safety glasses and large amount of tissues can be removed quickly. Hence, use of electrocautery can be justified over the laser technique. There are two basic types of electrosurgical units that available in dentistry: Monopolar having a single electrode 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 production is seen when the electrode contacts the tissue as a result of which pain that is produced. Bipolar involves the use of two electrodes placed in very close proximity to each other. In, Bipolar units the electrical current flows from one electrode to the other, and there is no need for grounding pad. Bipolar units offer less precise cut than the monopolar or diode laser due to the use of two wires. 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, eliminating the need for sutures. The result is in agreement with Devishree et al<sup>1</sup>. The healing was also comparable with the conventional scalpel technique, without any delay. But the literature suggests delay in healing, when electrocautery is used<sup>14</sup>. The need for suturing was eliminated while treating the patient with electrocautery, which reduced the risk of post-operative infection. There was no post operative pain seen in patient’s treated with electrocautery.

**CONCLUSION-**

This study shows equivalent results for both the techniques. But , there is 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.

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