**Evaluation Of Patient Perceptions After Lingual Frenectomy Performed With 810 nm Diode Laser: A Case Series.**

Dr. Nithya R Krishnan*, Dr. BS Jagadish Pai**, Dr. Amit Walveker***, Dr. Rashmi Pattanshetty*, Dr. Ansu Emmanual*

*Post Graduate Student, **Professor, ***Professor & Head

Dept. of Periodontics And Implantology, Coorg Institute Of Dental Sciences.

**ABSTRACT**

**BACKGROUND**

Frenectomy, removal of an aberrant frenal attachment, can be performed with conventional procedure like local anesthesia and scalpel blades. This can create a field of blood which will interfere with the visibility of operator. Another common problem that encounter was the apprehension of patient to local anesthesia and pain. Use of lasers in various surgical procedures have shown a good result.

**METHODOLOGY**

This case series includes the laser assisted lingual frenectomy performed in 10 patients. 810nm diode laser was used to perform this procedure. Patients pain was assessed by using visual analogue scale during, immediately and after 7 days of the procedure. Postoperative healing was also checked after 7 days of surgery.
RESULTS

Visual analogue scale showed a score of 2 (mild pain) for 4 patients during the procedure which persistent even after the procedure for two patient. All other 6 patients showed a Score of 0 seven days after the procedure with an uneventful healing.

CONCLUSION

Laser assisted frenectomy has less intraoperative and postoperative complication when compared to conventional scalpel procedure.

Keywords: Frenectomy, laser, visual analogue scale

INTRODUCTION

A small frenum is called as frenulum. 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. Their main function is to provide stability of the upper and lower lip and the tongue.

Lingual frenulum is the thin strip of tissue that runs vertically from the floor of the mouth to the under surface of the tongue. When the frenum is tight and thick and/or its place of insertion limits the mobility of the tongue, it can result in ankyloglossia (from the Greek "ankylos" which means tied and "glossa" which means tongue).

Ankyloglossia is an embryological anatomical malformation that is commonly affecting males more than females. It occurs in newborns, more frequently as an isolated event and sometimes associated to malformative syndromes. Surgical reduction of the frenum is indicated when the frenum anomaly is relatively severe and generates mechanical limitations and functional challenges. It is followed by speech therapy for an immediate rehabilitation of the lingual muscle. It should be also emphasised that a short frenum is not always tight or fibrotic; in fact, despite the reduced length of the lingual frenum, the floor of the mouth may still allow a normal mobility of the tongue due to its elasticity thus making the frenectomy unnecessary.
Traditional frenectomy technique require local anaesthesia, scalpels for incisions and sutures. All this requires surgical dexterity as well as the management of patients. Frenectomy can also be done using electro surgery\textsuperscript{4-9}. Disadvantages of traditional frenectomy includes intraoperative bleeding due to injury to the lingual vessels there by hampering the operators vision ,difficulty in suturing, postoperative pain, secondary haemorrhage, etc. Laser can be used as an excellent alternative to traditional surgery. The predictability of laser for lingual frenectomy is better than traditional frenectomy because it is simple and rapid to perform, well accepted and tolerated by patients, requires a minimal anaesthesia, with an asymptomatic postoperative period, without relapse.

All the wavelengths in the electromagnetic spectrum are very useful tools for mucogingival surgery; the visible and non-visible near infrared lasers work in a non-specific mode on the vascular component of the frenum, while the far and medium infrared lasers targets on the aqueous component (Hydroxyl radical) of the collagen fibrotic tissue of the frenum. The Potassium Titanyl Phosphate (532 nm) laser, the diode laser (810 - 980 nm) and the Nd:YAG laser can be safely used, allowing for a good and better controlling of bleeding. The medium and far infrared lasers targets on the fibrotic tissue of the frenum, as they in fact work, superficially, on the aqueous component of collagen fibers.

**METHODS**

This case series was carried out at Department of periodontics, Coorg Institute Of Dental Sciences, Virajpet, Karnataka, India. A total of 10 patients including 5 males and 5 females with age ranging from 15 years to 35 years old were included. Patients were explained about laser assisted frenectomy procedures verbally. Each patient /parents in case of children were given a written instructions and questionnaire sheet. All patients signed an informed consent for using laser in surgery. Patients were evaluated by clinical examinations and were asked to fill the questionnaire sheet upon follow up visit and safety measures prescribed by the manufacturer were followed. An AMD Picasso, 810 nm diode laser, in Continuous Wave contact mode, with 1 watt power was used. Safety measures were taken by all personnel participating in the surgery by wearing protective safety eyeglasses and masks.

Laser surgical intervention was performed under topical anaesthesia. The tongue was retracted upwards and posteriorly. For better visualization the frenum was grasped and
tightened by placing the operator fingers (index & middle) as close to the base of the tongue as possible and retract the ventrum of the tongue. The tip of the fiber optic was held in an oblique direction to the frenum in contact mode between the laser tip and was moved in a brushing stroke first above and then down. Charred tissue was wiped off with wet guaze. After surgery, all the patients were given instructions which include; avoid taking hot, spicy, citrus and hard foods for a few days, soft diet instructions, meticulous oral hygiene is practiced. Patients were also asked to fill in a questionnaire chart for the study. During the postoperative period, patients were asked to practice the physio-exercises i.e. pull up the lip and separate the lip from the gingival tissue and move the tongue upwards and laterally frequently many times a day and commitment to follow up appointments on the exact date. All patients were examined at 1st and 7th day after surgery to assess pain, bleeding, edema, tongue movements and overall satisfaction.

PREOPERATIVE                                             POSTOPERATIVE

RESULTS

Among 10 patients, 6 reported no pain and discomfort during and 7 days after the procedure on visual analog scale (VAS). 4 patients reported mild pain during the procedure and 2 reported mild pain immediately after the procedure. Satisfactory healing was observed after 7 days. The patient reported increase in tongue mobility and normal speech.
Scores obtained in visual analog scale are given in the table below:

<table>
<thead>
<tr>
<th>Case</th>
<th>Intraoperative Pain</th>
<th>Immediate Post Operative Pain</th>
<th>Pain after 7 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>Score 0 (No Pain)</td>
<td>Score 0 (No Pain)</td>
<td>Score 0 (No Pain)</td>
</tr>
<tr>
<td>Case 2</td>
<td>Score 2 (Mild Pain)</td>
<td>Score 2 (Mild Pain)</td>
<td>Score 0 (No Pain)</td>
</tr>
<tr>
<td>Case 3</td>
<td>Score 2 (Mild Pain)</td>
<td>Score 0 (No Pain)</td>
<td>Score 0 (No Pain)</td>
</tr>
<tr>
<td>Case 4</td>
<td>Score 0 (No Pain)</td>
<td>Score 0 (No Pain)</td>
<td>Score 0 (No Pain)</td>
</tr>
<tr>
<td>Case 5</td>
<td>Score 0 (No Pain)</td>
<td>Score 0 (No Pain)</td>
<td>Score 0 (No Pain)</td>
</tr>
<tr>
<td>Case 6</td>
<td>Score 0 (No Pain)</td>
<td>Score 0 (No Pain)</td>
<td>Score 0 (No Pain)</td>
</tr>
<tr>
<td>Case 7</td>
<td>Score 2 (No Pain)</td>
<td>Score 2 (Mild Pain)</td>
<td>Score 0 (No Pain)</td>
</tr>
<tr>
<td>Case 8</td>
<td>Score 0 (No Pain)</td>
<td>Score 0 (No Pain)</td>
<td>Score 0 (No Pain)</td>
</tr>
<tr>
<td>Case 9</td>
<td>Score 2</td>
<td>Score 0</td>
<td>Score 0</td>
</tr>
</tbody>
</table>
**DISCUSSION**

A surgical frenectomy procedure involves grasping the frenum with hemostats and placing incisions above and below it thereby creating a large triangular-shaped wound followed by placement of sutures. Patients often experience post-surgical bleeding and pain, and sutures can further increase bleeding and pain when they are in contact with food. The unpleasant taste of blood and unaesthetic appearance of sutures may result in a loss of the sense of well-being during the postoperative period. In addition, suture removal from gingival and labial tissues after 1 week can be painful because the sutures may be buried in the mucosa.10-12 To overcome these disadvantages, some clinicians use bioabsorbable sutures after oral surgery.

On the other hand, the laser technique offers some advantages, 1. Dry and bloodless surgery 2. Instant sterilization of the surgical site 3. Reduced bacteremia 4. Reduced mechanical trauma 5. Minimal postoperative swelling and scarring, which forms the rationale for using lasers over other techniques as described by wigdor et al.13 There is abundant evidence confirming markedly less bleeding14,15,16 particularly of highly vascular oral tissues, with laser surgery. Some reports suggest that laser-created wounds heal more quickly and produce less scar tissue than conventional scalpel surgery, the same results were found in this study.17,18,19 Postoperative pain from oral surgical procedures has been claimed to be reduced in laser surgery.20 It is theorized that this may be due to the protein coagulum that is formed on the wound surface, thereby acting as a biologic dressing and sealing the ends of the sensory nerves.20 The result of this study showed that the patient experienced a mild intraoperative pain and no postoperative pain followed by laser assisted frenectomy. Laser assisted frenectomy can be used as a predictable treatment modality.

<table>
<thead>
<tr>
<th></th>
<th>(MILD PAIN)</th>
<th>(NO PAIN)</th>
<th>(NO PAIN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASE 10</td>
<td>SCORE 0</td>
<td>SCORE 0</td>
<td>SCORE 0</td>
</tr>
<tr>
<td>(NO PAIN)</td>
<td>(NO PAIN)</td>
<td>(NO PAIN)</td>
<td></td>
</tr>
</tbody>
</table>
CONCLUSION

In the present case series, lingual frenectomy was done using diode laser which provides practical benefits to the patient as it reduces bleeding, postoperative pain, and swelling. In future, patients could be benefited by the laser-assisted surgeries and many procedures using lasers are now becoming the treatment of choice for both clinicians and patients. Clinicians need to be aware and constantly updated on new technologies and apply newly discovered methods and protocols to benefit patients in clinical situations.

ACKNOWLEDGEMENT

I acknowledge the help and moral support given to me by DR. Amit Walvekar, DR. Jagadish Pai, DR. Ranjeeta Alexander, DR. Rashmi Pattanshetty, DR. Anish Varkey during the course of this study.

REFERENCES


