CASE REPORT

Maxillary Labial Frenectomy using Diode Laser and Classical Technique: A Case Report

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ABSTRACT

One of the essential surgical procedure is the frenectomy. The labial frenum is an anatomical landmark that joins the lips and cheeks to the alveolar processes of maxillary and mandibular bones. This fold contains vascular structures with thin peripheral nervous ramifications that is covered by stratified layered epithelium and their high attachment may involve orthodontic, prosthodontics and prosthodontics discrepancies as well as speech inability. An abnormal frenum is termed as a hypertrophic, fibrotic, ample, fan-shaped or bifid-ending structure. Diode laser has verified to be successful with soft-tissue incision and also led to a considerable decline in operating time.

KEYWORDS: Frenectomy, Scalpel Technique, Diode Laser

INTRODUCTION

Frenum is a collagen fibres with connective tissue, forms a folded mucous membrane, where the muscle fibres originated from orbicularis oris muscles. Frenum is categorized in two for maxillary and mandibular. Content of frenum is;

- Variable amount of loose connective tissue with elastic and dense collagen fibres
- Fat cells
- Occasionally acini of mucous producing salivary glands
- Muscle fibres
- Mucogingival junction – closely associated.

Classification of frenum by Placek et al 1994;

- Mucosal
- Gingival
- Papillary
- Papillary penetrating

This frenum is shielded by means of stratified layered epithelium which contains vascular structures with thin peripheral nervous ramifications. Hypertrophic, fibrotic, ample, fan-shaped or bifid ending construction are described as an abnormal frenum whose development is not dependent upon its point of insertion.[1]

The unusual frenum can be treated by *frenectomy* or by *frenotomy* procedures. Surgical removal of the unusual frenum is known as frenectomy that includes its attachment to the underlying bone, whereas *frenotomy* is the incision and the repositioning of the frenal attachment. Frenectomy can be consummated either by the routine scalpel technique, electro surgery or via lasers. 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.[2]

The role of laser in dentistry is well-established in traditional management of oral diseases.[3]. It is an instrument that has achieved maximum oral health in a minimally invasive fashion, so far, that laser technology is developing very quickly .[4] The leading laser demonstrated by Robert N. Hall in 1962 stayed a diode laser, which stands a solid-state semiconductor laser that classically uses a combination of Gallium (Ga), Arsenide (Ar), and supplementary elements, such as Aluminium (Al) and Indium (In), to change electrical energy into light energy. It is usually operated in contact mode by means of a flexible fibre optic delivery system that emits in continuous- wave or gated- pulsed modes.[5]

The aim of this study was to parallel the effects of the DIODE laser and the conventional scalpel technique on the degree of postoperative pain, discomfort and rate of healing experienced by patients after frenectomy operation.

CASE REPORTS

CASE -I: SURGICAL FRENECTOMY

A 22 year old female patient with complaint of gapping between upper front teeth reported to Department of Periodontics and Oral, Maitri College of Dentistry and Research Centre, Durg, Chhattisgarh. On clinical examination pull test revealed a papillary penetrating type

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of maxillary labial frenum attachment (Figure 1a). Medical history was not significant. After obtaining informed consent, labial frenectomy was planned using the classical technique introduced by Archer (1961) and Kruger (1964). Procedure performed was classical scalpel technique;

- Local infiltration given by using 2% lignocaine with 1:80000 adrenaline.
- Haemostat was inserted to deepest depth of vestibule with the help of No.15 Bard Parker blade, two parallel vertical incision was given (Fig-1b).
- Triangular resected frenum was removed and underlying tissue was exposed (Fig.1b).
- Horizontal incision were made to separate the attached fibres with gradually blending of vestibular tissue.
- 4-0 suture was placed with periodontal pack over it (Fig-1c).
- On removal of the dressing and silk suture healing approved to be a satisfactory (Fig-1d).

Fig 1a: Pre-Operative View

Fig 1b: After frenectomy

Fig 1c: Sutures placed

Fig. 1d : Post-operative 1 week

CASE -II: LASER ASSISTED FRENECTOMY

A 20 year old female patient with complaint of gapping between upper front teeth reported to the Department of Periodontology and Oral Implantology, Maitri College of Dentistry and Research Centre, Durg, Chhattisgarh . After clinical examination [Fig-2a] patient had papillary type of frenal attachment.

It was decided to excise the frenum by using [Fig-2] Diode Laser (810nm, Picasso; AMD) at 0.8W, continuous contact mode using light-brush stroke motion. Procedure was:

- Topical xylocaine was applied on frenum.
- The laser was activated before performing the procedure.
- Surgical disposable tip at 400 MM 7mm length was used from base in a brushing stroke.
- The laser activated at 1 Watt in continuous mode (Fig-2b).

Fig. 2a: Pre-Operative View

Fig. 2b: Diode Laser

- Attachment of fiber were exposed in a bloodless field which is one of the advantage.(fig. 2c)
- No suturing or periodontal pack was placed and post-operative instruction was given.
- Patient reported after 10 days the healing was significantly satisfactory then compared to classical technique.(fig.2d).
- Laser showed less discomfort and post-operative pain.

Fig. 2c: After frenectomy

Fig. 2d: Post-operative 1 week

DISCUSSION

For many intraoral soft tissue surgical measures, the laser is a feasible substitute to the conventional methods. The commercially obtainable dental instruments have emission wavelengths ranging from 488 nm to 10,600 nm and are entirely non-ionizing radiations to circumvent any mutations in the cellular DNA components which ionizing radiations are known to cause. One of the main benefits of using diode lasers is the ability to selectively and precisely interact with diseased tissues. Lasers permit the clinician to reduce the amount of bacteria and other pathogens in the surgical field, as well as, in the case of soft-tissue measures, achieve good haemostasis with the reduced precondition for sutures. The claimed benefits of lasers vin contrast to conventional surgery comprise increased coagulation that yields a dry surgical field and better visualization; the ability to negotiate curvatures and folds within tissue contours; tissue surface disinfection and consequently, decrease in bacteraemia; reduced distension, edema, and scarring; decreased pain; faster healing response; and increased patient appreciation. Once laser cutting is in progress, minor blood and lymphatic vessels are impassable due to the produced heat, thus reducing or eliminating flow of blood and edema. Denatured proteins restricted tissue and plasma are the source of the layer characterized "coagulum", which is formed as a result of laser action and serves to protect the wound from bacterial or frictional feat. On the contrary, the diode laser did not profit any deleterious effects on the root surface. Hence, diode laser surgery can be performed safely in close proximity to dental hard tissue.[6]

All these above mentioned advantages were evidently experienced in our laser case. During procedure, there was definitely no bleeding. Likewise, postoperatively, no discomfort was experienced by the patient and no swelling or any other signs of infection were noticed, however other alternative procedures have to be accompanied by administration of antibiotics and analgesics to minimize postoperative infection and pain.

CONCLUSION

Oral frenula are band like formations of congenital located on the midline, which comprised of fibrous, muscular or fibro muscular tissue, fenced by means of a mucosal membrane and this fold contains vascular structures with thin peripheral nervous ramifications and is covered by stratified layered epithelium.

Diode laser has proven to be effective in soft-tissue incision and also in reducing considerable operating time along with that, it has also reduced the amount of local anaesthetic to be used during the procedure and also the placement of surgical sutures.

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