



COMPARISON OF MAXILLARY LABIAL FRENECTOMY PROCEDURE WITH CONVENTIONAL CLASSIC TECHNIQUE AND DIODE LASER: A CASE REPORT

Periodontology

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ABSTRACT

The frenum is a mucous membrane fold that attaches the lip and the cheek to the alveolar mucosa, the gingiva, and the underlying periosteum. An Aberrant frenum encroaches the gingival health when it is attached too closely to the gingival margin, either due to interference in the plaque control or due to a muscle pull. Such condition has to be treated by frenectomy which can be performed by scalpel, electrocautery, or with soft tissue lasers. Hence, this case report was carried out to compare the conventional surgical technique with diode laser technique.

KEYWORDS

Diode laser, frenectomy, scalpel.

INTRODUCTION

Aesthetic concerns have led to an increasing importance in seeking dental treatment, with the purpose of achieving perfect smile. The continuing presence of a diastema between the maxillary central incisors in adults, has often been considered as an aesthetic problem. The presence of an aberrant frenum being one of the aetiological factors for the persistence of a midline diastema, the focus on the frenum has become essential.¹

The word frenum is derived from the Latin word "fraenum. Frena, are triangle-shaped folds found in the maxillary and mandibular alveolar mucosa, and are located between the central incisors and canine premolar area. 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.²

Depending on the attachment of fibers, frenum has been classified as follows:³

- **Mucosal:** Fibers that are attached up to mucogingival junction
- **Gingival:** Fibers inserted within attached gingiva
- **Papillary:** Fibers extended into interdental papilla
- **Papilla Penetrating:** When the fibers cross the alveolar process and extend up to the palatine papilla.

The unusual frenum can be managed 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.⁴

The role of laser in dentistry is well-established in traditional management of oral diseases.⁵ It is an instrument that has achieved maximum oral health in a minimally invasive fashion, so far, that laser technology is developing very quickly.⁶ 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.⁷

Case Presentation

Case Report 1

A 35 year old male patient reported to the Department of Periodontology, Rajarajeswari Dental College and Hospital, Bangalore with a chief complaint of increasing gap in between the upper front tooth region (Fig.1). The patient's medical and dental history was not significant. On clinical examination tension test revealed a papillary type frenal attachment. The oral hygiene status was good.

Surgical Frenectomy

After obtaining informed consent, labial frenectomy was planned using the classical technique introduced by Archer (1961) and Kruger

(1964). The area was anaesthetized with a local infiltration by using 2% lignocaine with 1:80000 adrenaline. The frenum was engaged with a haemostat which was inserted into the depth of the vestibule (Fig-2) and incisions were placed on the upper and the undersurface of the haemostat until the haemostat was free (Fig-3). The triangular resected portion of the frenum with the haemostat was removed. A blunt dissection was done on the bone to relieve the fibrous attachment. The edges of the diamond shaped wound were sutured by using 4-0 black silk with interrupted sutures (Fig-4) and the sutures were removed 1 week post-operatively.



Fig 1: pre-operative Papilla Type Of Frenal Attachment



Fig 2: Frenum Held With Haemostat

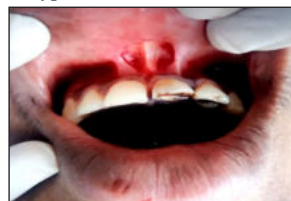


Fig 3: Frenum Excised



Fig 4: Sutures placed



Fig 5: One month post-operative

Case Report 2

A 20 year old male patient with complaint of gapping between upper front teeth (Fig-1) reported to the Department of Periodontology, Rajarajeswari dental College and Hospital, Bangalore. After clinical examination patient had papillary type of frenal attachment.

Laser Frenectomy

The frenectomy was performed using diode laser (SIRO Laser Xtend, Sirona Dental Systems, Germany) with a wavelength of 980nm. The laser was operated at a power of 3.0 watt in continuous wave mode, with 320-micron quartz optical fiber (Fig-2). The fiber tip was held in light contact with the tissue, in gentle, sweeping brushing strokes while the operator lifted the upper lip to stretch the frenum slightly. Throughout the procedure, wavelength specific goggles were worn by the patient and staff and high-speed evacuation was employed to reduce the slight

charred odor and to remove the laser plume. Hemostasis was achieved without suturing (Fig-3). Analgesics were not given since no post operative discomfort was expected.



Fig 1: pre Operative View



Fig 2: Frenectomy with diode laser



Fig 3: After frenectomy



Fig 4: One month post operative view

DISCUSSION

For many intraoral soft tissue surgical measures, the laser is a feasible substitute to the conventional methods. The classical technique leaves a longitudinal surgical incision and scarring, which may lead to periodontal problems and an unaesthetic appearance, thereby necessitating other modifications. 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 in 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.⁸

All these above mentioned advantages were evidently experienced by the patient who underwent treatment with laser. 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.

Conflict Of Interest

Authors Dr. Sruthi K Nair, Dr Shivaprasad BM, states that there are no conflicts of interest.

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