LASER ASSISTED FRENECTOMY – A CASE REPORT

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Abstract

A frenum is a fold of tissue or muscle connecting the lips, cheek or tongue to the jawbone. Their high attachment may cause orthodontic problem (Central diastima), prosthodontic problems (Poor retention of denture), periodontic problems (gingival recession and inflammation) and speech problem (tongue tied in ligual frenum). A frenectomy is the removal of one of these folds of tissue and it is a common procedure in the specialty of maxillofacial surgery. The removal of frenum could be done by surgical excision using scalpel through different techniques eg. (Vertical, Z plasty and hemostat). Modern technology now offers an alternative mode of treatment like laser surgery .Laser-assisted frenectomy is a much more comfortable for the patient because it means that no scalpel or stitches are required.

Key words: Diode LASER, Frenum, Frenectomy.

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. Until recently the classical or conventional frenectomy (surgically by scalpel and suturing) was the only way to remove the aberrant frenum. Modern technology now offers an alternative mode of treatment, like laser surgery.

There are different types of lasers according to their different wavelengths and their interaction with tissues. They can be used for hard and soft tissues in oral cavity. In soft tissue procedures (gingivectomy, frenectomy, lesion removal) CO_2, Nd:YAG, Argon, Er:YAG and Diode laser were used. Diode laser is a semi conductor(Gallium Aluminum Arsenide (Ga-Al-As) used in surgery. It emit coherent monochromatic light of wavelength between (810-900) nanometer i.e. near infrared. This radiation is absorbed in dark media, as in hemoglobin and therefore has a remarkable surgical cutting efficiency in well vascularised tissues. This article is to describe a clinical case of maxillary frenectomy with diode laser.

Case Report

This clinical case was carried out at Department of Periodontics and Oral Implantology. The patient aged 38 year reported to the department with the chief complaint of midline diastema. On intraoral examination the papilla penetrating type of frenal attachment was seen. (Figure 1) and was decided to perform laser assisted frenectomy. The details of the laser assisted frenectomy procedures were explained verbally to patient. Patient signed an agreement informed consent for using laser in surgery. Patient was evaluated by clinical examinations and documented by digital photos and patient was prepared for laser surgery and viral screen (HBsAg, HCV, and HIV) was requested. 980 nm diode laser was used. Patient in the surgery wore protective safety eyeglasses and masks and local anaesthesia was administered. For laser-assisted labial frenectomy; the upper lip was pulled upward by the assistant hands, then frenum was tightened.

Figure 1: Papilla penetrating frenal attachment

The incision was started with the frenum from the attached gingivae and interdental papilla on the labial surface between the central incisors extending upward from inner side of upper lip to the depth of vestibule ending in a rhomboidal raw area, separating the fibers from the periosteum. The tip of fiber optic was hold in perpendicular or oblique direction to the frenum in contact mode between the laser tip and tissue surface. (Figure 2)

Figure 2: Application of diode laser

The procedure was completed by cutting first above and down avoiding the vessels and glands in the floor of the mouth. After end of laser exposure, the surgical site was wiped off with normal saline wet cotton roll. (Figure 3) After surgery, the patient was given verbal instructions that including; avoid taking hot, spicy, citrus and hard foods for a few days, soft diet instructions, meticulous oral hygiene. Post operative antibiotics and analgesic were given to the patient. During the postoperative period,

practice the physio-exercises i.e. separate the lip from the gingival tissue by pulling up the lip and move the tongue upwards and laterally frequent times a day and commitment to follow up appointments in the exact date. On follow up patient showed good oral hygiene and and mucosal type of frenal attachment was seen. (Figure 4)

Figure 3: LASER cutting

Figure 4: Post operative follow up.

Discussion

Photothermal interaction with tissue is the basic concept of surgical laser. In this process, radiant light is absorbed by the tissue and transformed to heat energy changing tissue structure. Laser light within was converted to thermal energy on contact with the tissue, causing laser tissue interaction, that when appropriately applied, can produce reaction ranging from incision, vaporization, to coagulation.[1] This wavelength has affinity for melanin or dark pigments, and is strongly absorbed by the blood hemoglobin, which contributes to their thermal effect. Therefore, this laser works more efficiently when the energy applied in the presence of pigments. Since lasers were first introduced into dentistry, there have been investigations done to establish the laser parameters (i.e., wavelength, power density, continuous or pulsed mode, time of exposure, and spot size) that are most effective and least harmful for treating the soft and hard tissues of the oral cavity[2]. Laser treatment has served as an alternative or adjunctive treatment to more conventional therapies because of its many advantages, including ablation or vaporization, homeostasis, and sterilization. For routine clinical dental treatments, pain control is quite important for patient physical and mental well-being, as well as for the effectiveness of therapy.[2,3] The laser a coagulation effect on small vessels that provides hemostasis and seals the sensory nerve endings.[4]

In this present clinical case the use of 980 nm diode laser allowing increased surgical precision and accuracy, thereby reducing unnecessary damage to underlying tissues, and the procedure was with no bleeding in all cases, resulting in improving visualization of the surgical field, eliminating the need for postoperative sutures, and shortening the operation time probably the efficiency of the laser allows sealing lymphatic and blood vessels that renders a bloodless surgical field.[5] Patient had no functional complications since there was no damage to adjacent healthy tissues, with less wound contraction during healing; meaning that there is less mucosal scarring, resulting in satisfactory mobility of the soft tissue and consequently, there was a minimal oral dysfunction. One of the main benefits of using dental lasers is the ability to interact selectively and precisely with diseased tissues, that explains the less degree of surrounding tissue injury, no significant complications, limited scarring and contraction and probably bio-stimulation effect of laser.[6]

Conclusion

The use use of laser provides an opportunity of performing frenectomy without the need for hospitalisation or general anaesthesia in infants patients. Diode laser appears to be a satisfying candidate because it has no harmful effects to the teeth and is cost effective. Neverthless, more investigation are needed to establish the exact efficacy of different lasers used. Finally clinicians must fully undersand the basic science, safety protocol and risk associated with the laser to be used regardless of any type.

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