



Use of LASER to Increase the Width of the attached Gingiva: A Novel Approach

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ABSTRACT:-

Inadequate width of attached gingiva can hinder oral hygiene maintenance and may result in recession. Therefore, it is essential to enhance the width of attached gingiva. This case report presents a case involving a 40-year-old male patient who was referred from the Department of Prosthodontics due to inadequate vestibular depth, which was attributed to insufficient width of the attached gingiva. A horizontal incision was made at the mucogingival junction from the area of tooth 34 to 44 region. A partial-thickness flap was elevated to achieve the necessary vestibular depth at the recipient site. An aluminium foil was placed onto which a periodontal pack was applied. After 21 days of healing, the width of the attached gingiva increased from 2 mm at baseline to 5 mm. According to the Visual Analog Scale (VAS), the patient reported mild pain.

Keywords: Attached gingiva width, Vestibuloplasty.

I. Introduction

A vestibular depth that is optimal aids in maintaining oral hygiene, whereas one that is insufficient results in gingival recession, poor plaque control, and reduced aesthetics [1]. This might be fixed via a scalpel-based vestibuloplasty procedure, Cryosurgery, lasers, or electro surgery. Lasers for soft tissue benefit from improved visualization, quicker healing, and hardly any anesthesia is needed. Diode lasers are used

because of its small size and it is affordable [2,3]. The administration of this case study is presented for management of the shallow vestibular depth in the lower anterior area with a diode laser.

Case Report

A 40-year-old male patient was referred to the Department of Periodontics from the Department of Prosthodontics due to insufficient width of attached gingiva in the regions of 31, 32, 41, and 42. The patient had no notable medical history and did not report any habits related to alcohol or smoking. There were no significant findings in the extraoral examination. The patient expressed a desire to replace his missing natural teeth. An intraoral examination revealed that the width of attached gingiva in the regions of 31, 32, 41, and 42 measured 2 mm, respectively. Additionally, inadequate vestibular depth was noted as a result of the insufficient width of attached gingiva. The treatment plan proposed was to enhance the width of the attached gingiva utilizing a 980nm diode LASER.

Treatment Plan: Following phase I therapy, the patient received comprehensive oral hygiene instructions with a focus on effective plaque control. Informed consent was obtained, and the surgical procedure was thoroughly explained to the patient. The surgery was performed under strict aseptic conditions and precautions under local anesthesia. A horizontal incision was made at the mucogingival junction spanning from the 34 to 44 regions. A partial thickness flap was elevated to the necessary vestibular depth, and fenestration cuts were created. An aluminum foil was placed, and Coe Pak was applied. For postoperative care, the patient was prescribed 0.2% chlorhexidine mouthwash to be used twice daily for four weeks. Additionally, Aceclofenac 100 mg and paracetamol 325 mg were prescribed twice daily for five days, along with reinforced oral hygiene instructions. The periodontal pack was taken out of the surgery site after 14 days.

The patient experienced discomfort following surgery. The surgical location healed with uneventful healing. The gain in the vestibular depth from 2 mm at baseline to 5 mm at the surgical location after 14 days of recovery. The patient reported modest pain and a small change in color, according to the visual analog scale. Twenty-one days following surgery, the entire surgical site healed.

Armamentarium used



Horizontal incision was given at mucogingival junction from 32 to 42 region



Partial-thickness flap was raised till the required vestibular depth.



An aluminium foil was kept above the partial thickness flap.



Periodontal pack was placed above the aluminium foil.

PRE-OPERATIVE



Width of attached gingiva
w.r.t 42 region is 2mm

POST-OPERATIVE



Width of attached gingiva
w.r.t 42 region is 6 mm



Width of attached gingiva w.r.t
32 region is 2 mm



Width of attached gingiva w.r.t
32 region is 5 mm



Width of attached gingiva
w.r.t 31 region is 2mm



Width of attached gingiva w.r.t
31 region is 5mm





Healing after 1month follow-up



Healing after 3 month follow-up



After prosthesis

II. Discussion:-

A number of lasers, including Diodes, Nd: YAG, Er, Cr: YSGG, and Co2, have been shown in the literature to contribute to more consistent clinical results for a variety of periodontal therapy procedures. Around the world, diode lasers are utilized for laser assisted periodontal operations because to their small size and low cost. Diode lasers are widely used in the literature for a variety of soft tissue operations, including frenectomy, gingivectomy, crown lengthening, gingival depigmentation, and gingival troughing, to mention a few. We want to assess the healing results following diode laser vestibuloplasty as well as the patient's impressions in this clinical investigation [3,4].

With differing degrees of success, several surgical methods have been employed to deepen the vestibule, including Corn's periosteal separation vestibuloplasty, Kazanjian vestibuloplasty, and Edlanplasty. The degree of surgical manipulation and the need for suturing, which result in considerable postoperative discomfort including swelling and agony and increase morbidity and diminish acceptance of these treatments, were the main downsides of these procedures [3,4].

The advantages of lasers, however, were superior. When doing a laser assisted vestibular deepening, less local infiltration anesthesia was needed than when performing a knife vestibuloplasty, which required a bilateral mental nerve block. Lasers enable improved visualization of the surgical field, effectively establishing hemostasis by enhancing the stimulation of factor VII for clotting, and minimizing the need for suturing. This resulted in an incision made with great precision and a shorter procedure time [5].

Diode lasers minimize post-operative edema by sealing tiny lymphatic channels with an efficient penetration depth of 2 mm into the tissues. Because there was less bleeding and discomfort related with the operation after the laser therapy, the patient was extremely comfortable [6].

Through secondary epithelialization, the denuded periosteum in the Clark vestibuloplasty operation repairs, slowing the healing process. Despite the fact that a free gingival transplant might expedite recovery, the patient's morbidity is increased because there is a second surgical site involved. On the other hand, because of the bactericidal effect of the diode laser—which was demonstrated in a study by Moritz et al. [7] who reported a significant reduction in bacteria providing a sterile wound bed with reduced risk of bacteraemia—lasers have an added advantage when it comes to causing asepsis in the surgical field. By forming a denatured protein coagulum known as "eschar" or "biological bandage," lasers also promote wound healing. The protein coagulum layer shields the wound from friction and microorganisms from masticatory forces.

According to the current case study, the patient who received laser therapy formed fewer scars. Our findings largely draw from research by Nammour et al. and Zeinoun T et al.[8,9], which found that compared to scalpel wounds, laser-treated wounds show less scar formation because of a smaller number of myofibroblasts, which causes a limited wound contraction. The supplementary advantage of the laser was apparent in our case study as it improves the establishment of a good vestibular depth because there is less tissue rebound. In contrast, patients in the scalpel group had a poorer outcome because there was more tissue rebound after the surgical procedure, which led to a poor vestibular depth.

Following surgery, low level treatment was applied to the wound bed. Low-level laser therapy reduces the activity of C fibers and increases the body's natural painkiller, β -endorphin synthesis, which relieves pain. This was demonstrated by the laser group's lower VAS values for pain and discomfort when compared to the scalpel group [8,9].

The biostimulating properties of LLLT lead to improved healing. Patients in the scalpel group showed more muscle attachment rebound than those in the laser group. Our results were in line with the conclusions drawn from case studies by Amid et al. and Moghtader et al. [10,11], who had pushed for the use of laser to improve outcomes for postoperative healing. Our contention that the laser wound group had superior healing capacities during the initial healing phase in comparison to the scalpel group was also supported by the three-point rating system. Our findings were consistent with those of Demir et al. and Neckel et al.[12,13], who had stated that laser therapy improved wound healing following vestibuloplasty surgery.

Fibrinous slough, which originates in the early stages of wound healing and takes shape in the first 24 to 72 hours after surgery, was examined in our case study to assess the wound healing mechanism. As can be seen from the photos, additional follow-up showed that the patient had a superior healing outcome with less production of slough. Walsh et al.'s findings, which showed that low-level laser therapy promoted mast cell degranulation and increased macrophage phagocytic activity, corroborate our findings. When combined, these lead to an efficient debridement of the wound and a decrease in the slough [14].

III. Conclusion:

The outcomes of our case report study show that the laser therapy successfully improved the patient's vestibular depth, which improved the patient's perceptions and healing outcome. Although more study with larger sample sizes and verified protocols are required, there is strong evidence that lasers are a safe, effective alternative to scalpels in vestibuloplasty surgeries.

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