LASER GINGIVECTOMY IN A PATIENT UNDERGOING ORTHODONTIC TREATMENT: A CASE REPORT

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ABSTRACT

The benefits of using a laser in soft tissue treatment include less oedema, reduced inflammation, and quicker recovery. Nowadays, soft-tissue interventions, including periodontal recontouring, operculectomy, or frenectomy, are possible thanks to the introduction of diode lasers that are strongly absorbable melanin and haemoglobin. In this case, a 17-year-old patient at the near end of her orthodontic treatment was concerned about her gummy smile. She also had a gingival swelling in the lower anterior segment. Furthermore, she had a high labial frenum attachment. It was decided to go for a gingivectomy and frenectomy with the help of a laser (Diode Lasotronix 980nm).

KEYWORDS: *Orthodontics, Laser Gingivectomy, Haemoglobin, Periodontal*

INTRODUCTION

Due to the increasing plaque deposition and poor dental hygiene, fixed orthodontic prostheses have been linked to impaired periodontal inflammatory conditions and gingival hypertrophy.[1] The process through which people get gingival overgrowth after orthodontic therapy is unknown. Periodontal inflammation begins and progresses because of an imbalance between pathogenic assault and the host defense.[2] Since gingival overgrowth is widespread or self-care is impaired, non-surgical gingival treatment (involving dental care training, scaling, and prophylactic treatment) may not always be beneficial.[3] If gingival overgrowth makes it more difficult to maintain dental hygiene (leading to more gingival tissue destruction), creates esthetic and functional concerns, and jeopardizes orthodontic advancement and function and supplemental therapy, including such gingivectomy, is required to modify borderline gingival shapes.[4] Traditional scalpels, electrosurgery, chemosurgery, and laser can all be used to conduct gingivectomy. The treatment goal of most of these surgeries is to get rid of the pseudo pockets. For its convenience of being used, precision, and less tissue injury, traditional surgery using a sharp scalpel has indeed been regarded as a very popular approach.[5] The enhancement of patients aesthetics is now one of the primary objectives of orthodontics as the proportion of people undergoing orthodontic therapy grows. Therefore, in context, gingival aesthetics is important. Even though the teeth remain properly aligned, abnormal dentogingival connections might have had a deleterious impact on treatment outcomes.[6] Lasers have indeed proven to be beneficial in several professions, notably orthodontics. Gingivectomy procedure had become a standard aspect of orthodontic therapy after developing tissue diode lasers, which may be more cost effective and far less uncomfortable than traditional procedures. Since its impact range is restricted to soft tissue, diode lasers may ensure appropriate hemostasis, minimize the chance of infection, minimize further harm to bone and teeth, and promote soft tissue repair whilst increasing aesthetics.[7] The benefits of using a laser in soft tissue treatment include less edema, reduced inflammation, and quicker recovery.[8] Soft-tissue interventions, including periodontal recontouring, operculectomy, or frenectomy nowadays, are possible thanks to the introduction of diode lasers that are strongly absorbable by melanin and haemoglobin. Soft tissue may be incised to just a thickness of 2 to 6 mm using lasers.[9] Coagulation, protein denaturation, drying, and carbonization are all caused by localized heating at the energy-absorbing point. This could close blood arteries and block pain signals near the incisions. As a result, diode lasers may be beneficial due to enhanced management, reduced pain and swelling, and faster wound repair.[10] This case report presents a case of gingival recontouring in a patient having orthodontic treatment.

CASE

A 17-year-old patient, near the end of her orthodontic treatment, was concerned about her gummy smile. She

also had a gingival swelling in the lower anterior segment. Furthermore, she had a high labial frenum attachment. It was decided to go for a gingivectomy and frenectomy with the help of a laser (Diode Lasotronix 980nm). The pre-operative intraoral picture of the patient is shown in figure 1.

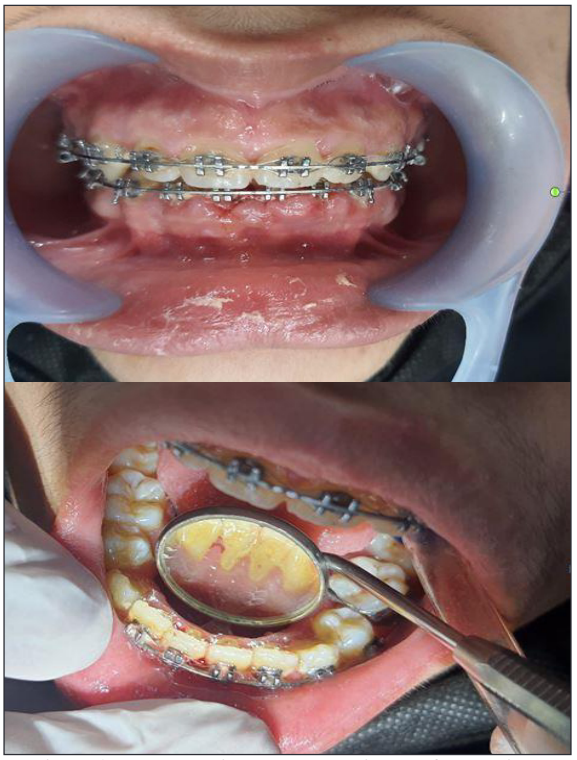
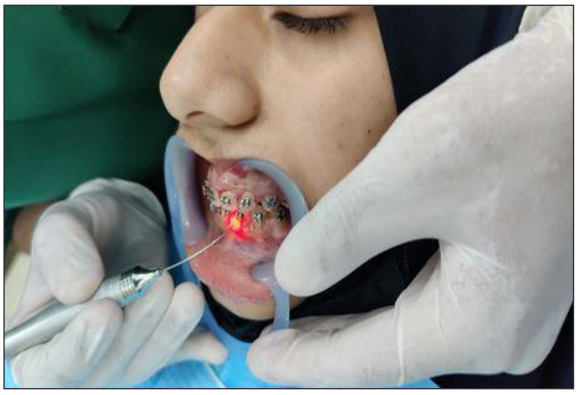


Figure 1: Pre-Operative Intra-Oral Picture of the Patient

After initial scaling and curettage, the patient was recalled after five days of antibiotic therapy. The patient was then appointed for laser gingivectomy. The laser tip was activated and inserted at the correct height to remove the attached gingiva. The procedure was first completed for the mandibular arch, as shown in figure 2.



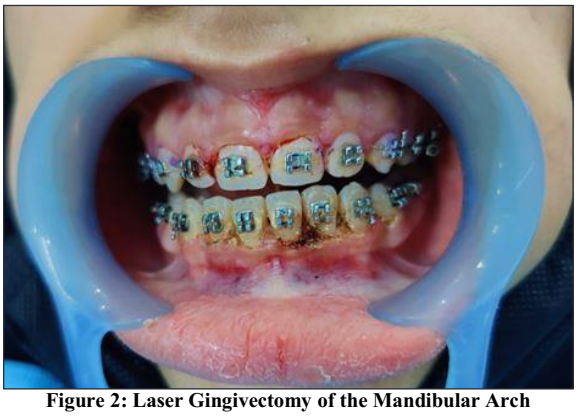


Figure 2: Laser Gingivectomy of the Mandibular Arch

Laser ablation to increase crown height was done, and ablated tissue was removed, as shown in figure 3.

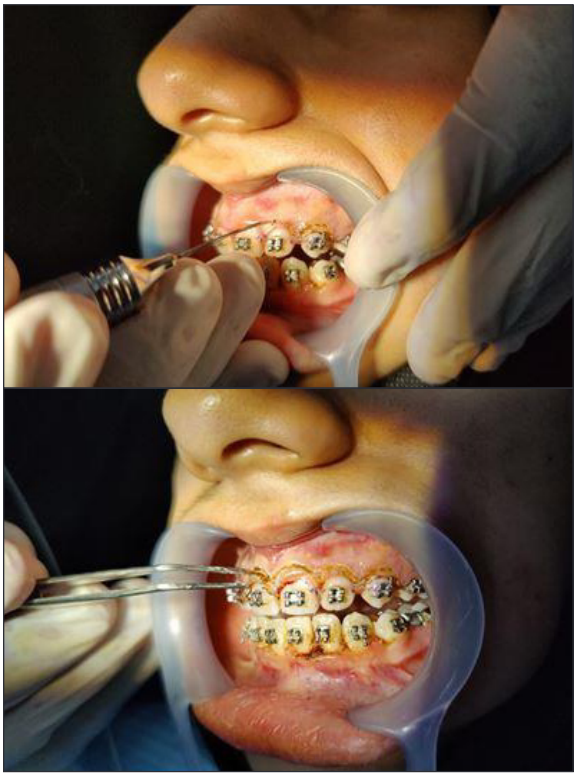


Figure 3: Insertion of the Laser Tip and Removal of the Ablated Tissue

The time and energy consumed during the laser gingivectomy of the upper and lower arch have been shown in figure 4.

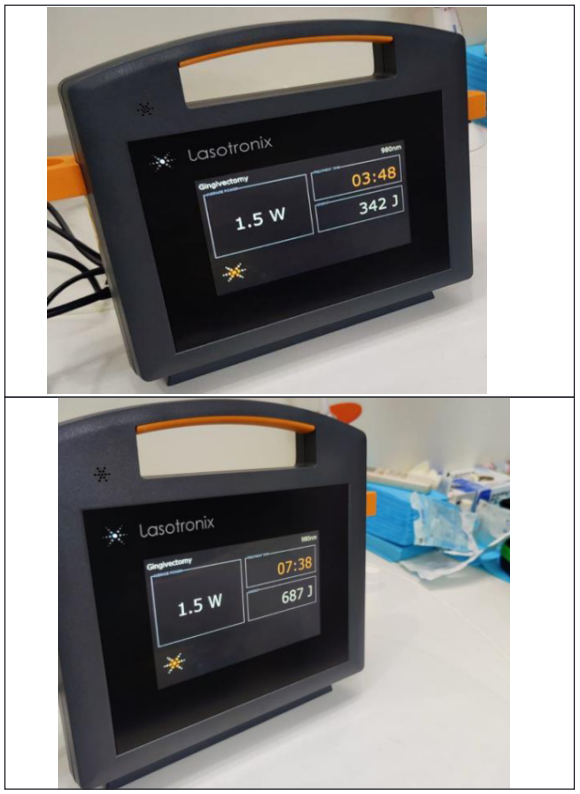


Figure 4: Energy and Time Consumed During Maxillary and Mandibular Arch Laser Gingivectomy

DISCUSSION

Due to their therapeutic effectiveness, lasers have been employed in various disciplines and contexts in dentistry. Orthodontic therapy produces gingival swelling at the margins, which leads to periodontal hypertrophy margins. The laser has several characteristics, making it a viable alternative for treating enlarged gingival margins.[11] Most gingival enlargement in orthodontic patients is idiopathic, owing to the period of therapy. The therapy for gingival enlargement combines diligent dental hygiene education and surgical procedure. When used properly, soft tissue lasers can enhance the reliability of outcomes, shorten healing duration, and save sessions for orthodontic patients. The laser therapy is fast, noninvasive, and infection-free, with few adverse effects for the patients.[12] Despite regularly educating patients and encouragement on dental cleanliness, patients frequently acquire gingival enlargements due to poor cooperation and complex orthodontic equipment forms. Gingival enlargements are traditionally addressed surgically with gingivoplasty or gingivectomy by surgical knives and blades.[13] Just after the development of soft tissue LASERS, traditional methods such as gingivoplasty and gingivectomy are being phased out in favour of LASER gingivoplasty and gingivectomy.[14] The following are some of the anticipated benefits of LASERS: lower intraoperative haemorrhage, shorter operating duration, quicker recovery, and reduced postoperative discomfort and inflammation. Patient satisfaction is high, and orthodontists can quickly restart therapy.[15] Laser wounds were reported to have had a smaller amount of Myofibroblast histologically, leading to much lesser wound contraction and fibrosis and enhanced overall recovery. Patients who require esthetic surgery may benefit from using a laser diode to reduce postoperative haemorrhage and discomfort.[16] In literature, various harmful effects of lasers are also present. Injury caused by lateral heating might cause prolonged recovery in lasers and electrocautery patients. The zone of coagulation necrosis created surrounding the incision line due to undesired heat generation is known as lateral heat injury. Histopathologically, this was discovered that sometimes lateral heat damages in the context of laser are 28.3-98 mm. The following are some factors that influence lateral heat injury, including the type and size of electrodes - the broader the electrodes, the more lateral heat is produced.[17] The partially corrected waveform generates significantly greater lateral heat. Cutting speed - the optimum cutting speed is 7 mm/s, with a period gap of 10-15 seconds between cuts to disperse heat. The surface of the tissue must have been wet for warmth to disperse. A reduction will aid the recovery process in lateral heat output.[18] Because of its accessibility, low weight, and diversity, the diode laser is quickly emerging and highly preferred. For dental soft tissue, diode lasers have a frequency of 980 nm. Diode lasers have a wavelength readily received by the chromophores (melanin and haemoglobin) in the gingiva, with a low possibility of harming the hard tissue architecture. It makes the region coagulate and dries out, preventing haemorrhage. There was no operational or cosmetic harm to the mucogingival system and no bone degradation in the affected area. The diode is a great soft tissue laser that can be used for sulcular cleaning and tissue surgery.[19] The laser gingivectomy procedure yielded a pleasing cosmetic result, a quick recovery time, and minimal postoperative pain.

LIMITATIONS

Diode lasers can be used as an adjunct to conventional treatment modalities but not the primary treatment for optimal results.

CONCLUSION

The benefits of using a laser in soft tissue treatment

include less edema, reduced inflammation, and quicker recovery. Nowadays, soft-tissue interventions, including periodontal recontouring, operculectomy, or frenectomy, are possible thanks to the introduction of diode lasers that are strongly absorbable melanin and haemoglobin. The introduction of lasers in the field of dentistry has revolutionized the process of dental health care delivery to patients.

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