



Comparative Study of Oral Soft Tissue Operations Using a Laser vs. a Scalpel

Maha Waleed Alghazali^{1*}, Rasha Abduljaleel Althabit², Abdulkareem Hussain Alwan³,
Madiha Fouad Jameel⁴, Afnan Abdulkareem Hussain⁵

Abstract

Background: The oral cavity, which stretches from the lips to the oropharynx, is the initial portion of the digestive system.

Materials and Method: Twenty-eight separate oral soft tissue surgeries were performed, fourteen with a 940 nm Diode laser with an output power of 1W and the other fourteen with a scalpel.

Results: Although there was no difference in healing between the two groups, patients who were operated on with a laser felt more comfortable than those who were operated on with a conventional manner.

Key Words: Diode Laser, Frenectomy, Gingivectomy, Oral Soft Tissue Operation, Scalpel.

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Introduction

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The mouth is the widest part of the gastrointestinal tract (GIT), and it is here that food mastication begins, which is the principal function of this bodily structure. It also has other functions such as speaking and breathing.

The upper and lower lips, uvula and faucets, cheeks on sides, palate superiorly, and mucosa covering the mylohyoid muscles inferiorly form the boundaries of the oral cavity (1).

Epithelial tissue lines the oral cavity, which is keratinized in the masticatory areas and non-keratinized in the lining sections (2).

The oral cavity is separated into two compartments: the vestibule, which is bounded on the outside by cheeks and on the inside by teeth, and the oral cavity proper, which is the main region of the oral cavity and is mostly occupied by the tongue (1).

Oral surgery refers to any procedure performed on the oral cavity under local anaesthetic, including soft tissue and hard tissue surgery. It is a physical injury that is used to remove sick tissue or to rectify misshapen or unpleasant circumstances in the tissue. (3).

LASER is an acronym for Light Amplification by Stimulated Emission of Radiation (Light Amplification by Stimulated Emission of Radiation). A laser device produces light (electromagnetic photons) with a certain wavelength, power density range, and frequency mode. (4) and (5).

Avoid tissue damage by selecting proper laser parameters that are appropriate for the desired action (Jelenkova 2013). Soft tissue cutting can be done with a variety of wavelengths, although infrared and near infrared are the most effective. (6).

Corresponding author: Maha Waleed Alghazali

Address: ^{1*}Assistant Lecturer, Department of Dentistry, Alrafidain University College, Baghdad, Iraq; ²Assistant Lecturer Department of Dentistry Alrafidain University College, Baghdad, Iraq; ³Assistant Professor, Section of Periodontotics, Department of Dentistry, Al-Rafidain University College, Baghdad, Iraq; ⁴Assistant Lecturer, Section of Prosthodontics, Department of Dentistry, Al-Rafidain University College, Baghdad, Iraq; ⁵Assistant Lecturer, Baghdad health directorate, Ministry of Health, Iraq.

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Because diode lasers have wavelengths between 800 and 980 nm, which are in the preferred spectrum for soft tissue cutting and do not interact with hard tissue, they are better suited for soft tissue procedures. (7).

Materials & Method

Twenty-eight male patients, aged 20 to 38 years, were chosen from the Al-Rafidain University College, Baghdad, Iraq, department of periodontics, department of dentistry. After scaling and polishing and dental hygiene training, all twenty-eight patients had distinct soft tissue oral surgery. They are all systemically healthy. The twenty-eight patients were randomly assigned to one of two groups: one received frenectomy, gingival depigmentation, and gingivectomy using a pulsed 940 nm Diode laser (epic; Biolase) with an output power of 1 W, and the other received frenectomy, gingival depigmentation, and gingivectomy using a pulsed 940 nm Diode laser (epic; Biolase) with an output power of 1 W. The second group, which was operated on with a scalpel, had five frenectomy procedures and nine gingivectomy procedures. To reduce the differences in pain and discomfort thresholds between men and women, all of the patients chosen were males. According to Helsinki, the ethical approval was obtained by the ethical committee at Al-Rafidain University College in Baghdad, Iraq. The first group received only a few drops of anesthetic (2 percent lidocaine with adrenalin), while the second received full dental anesthesia (2 percent lidocaine with adrenalin). The first group was not dressed after surgery, while the second group was treated with COE-pack periodontal dressing (Zinc Oxide Pack). Following up with questions about taking analgesics, discomfort, and any swelling that had developed was done one week and two weeks following the operation. The percentage records were used to calculate the statistical analysis.

No. of cases	Operation type	Operation tool
5	Frenectomy	Laser
6	Gingival depigmentation	Laser
3	Gingivectomy	Laser
5	Frenectomy	Scalpel
9	Gingivectomy	Scalpel

Results and Discussion

During surgery, despite the few drops of anesthetic in the first group, only four patients out of fourteen (or 29%) complained of light pain and did not require analgesics, whereas in the second group, all patients complained of moderate pain and required analgesics. Because laser has the effect of sealing blood vessels, there was bleeding during surgery in the second group, but there was little seeping of blood in the first group (8).

In terms of postoperative pain, ten out of fourteen patients (71%) in the first group reported no pain, whereas all patients in the second group required analgesics following the procedure. This is due to the fact that the laser affects prostaglandin release in addition to the seal effect on nerve endings (9).

In terms of postoperative swelling, there was no evidence of swelling in first group, but in second group five out of fourteen which represents 36% of the patients complained from mild swelling, and all the fourteen patients feel discomfort during eating and speaking, because of the periodontal pack, this is in agreement with Hadeel et.al (10).

In terms of healing, ten out of fourteen patients in the first group, or 71% were entirely healed after the first week, but none in the second group, according to Hadeel et al 2017. Both groups soft tissue procedures healed entirely fourteen days after the procedure.



Figure 1. A pre-operation frenectomy case in laser group



Figure 2 a post-operation frenectomy case in laser group



Figure 3. One week follow up frenectomy case in laser group





Figure 4. Pre-operative frenectomy case in scalpel group



Figure 5. Post-operative frenectomy case in scalpel group



Figure 6. One week follow up frenectomy case in scalpel group



Figure 7. Pre-operative depigmentation case in laser group



Figure 8. Post-operative depigmentation case in laser group



Figure 9. One week follow up depigmentation case laser group



Figure 10. Pre-operative gingivectomy case in laser group



Figure 11. Post-operative gingivectomy case in laser group



Figure 12. One week follow up gingivectomy case in laser group



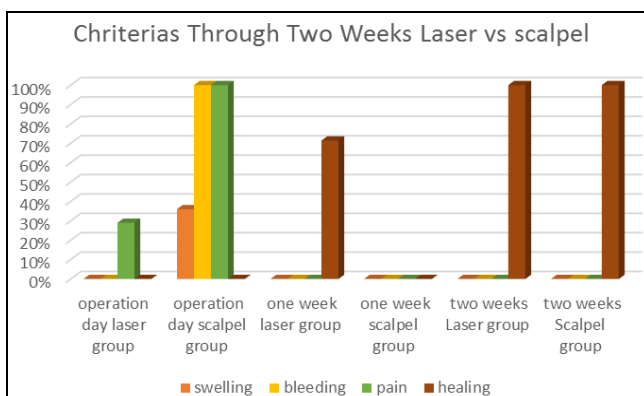
Figure 13. Pre-operation gingivectomy case in scalpel group



Figure 14. post-operation gingivectomy case in scalpel group



Figure 15. One week follow up gingivectomy case in scalpel group



Conclusion

This study found that soft tissue dental procedures performed with a pulsed 940 nm Diode laser with a power density of 1W have greater benefits than those performed with a scalpel, including pain

during and after surgery, discomfort after surgery, and bleeding during surgery.

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