Early Results of Oral Lesions Treatment with Laser Surgery

SUMMARY
Surgical laser technique has a lot of advantages compared to conventional techniques. The surgical laser is a powerful tool that adds great dimension to the oral and maxillofacial surgeon’s practice, but it warrants appropriate knowledge for usage in proper indications. The aim of this paper is to present the author’s experience and practice in laser application for 2 years in the University Dental Clinic of Tirana, Albania. 20 cases treated with diode laser are presented. All the patients were treated on the outpatient basis and were followed up for a week, 3 weeks and 3 months. Laser surgery was well tolerated by the patients; it is quick, painless and bloodless procedure. All the patients required only 1 treatment session. No swelling and no pain occurred postoperatively.

Keywords: Laser; Power Density; Wound Healing; Fluency

Merita Bardhoshi
University Dental School, Tirana, Albania

ORIGINAL PAPER (OP)
Balk J Stom, 2009; 13:149-152

Introduction
Laser is applied successfully in medicine, especially in surgery. It had been used concentrating its energy density (fluency) to ablate or remove the tissues. Many laser systems are available on the market, each of them having its own benefits and drawbacks. These laser systems are different in wavelength and therapeutic results.

Diode laser is classified as “soft laser”, wave length being 800-900 nm. Its main quality is high efficiency. Laser surgery has a lot of advantages compared with conventional techniques. These advantages are attributed to their biological effects, documented by many studies.

The goal of laser surgery is to create a temperature gradient or profile in tissues that will result in coagulation or vaporisation of tissue. Coagulation provides haemostasis and vaporization, the ability to cut, incise, excise, resect or ablate tissue. Generally, 4 reactions can happen when laser light interacts with tissue, which are: reflection, scattering, transmission and absorption. The balance of these reactions is determined by the wavelength of light and the type of tissue. However, only light that has been absorbed can yield a therapeutic result. In addition of wavelength’s light, the power density, fluency, and duration to exposure are important for tissue effects.

The outcome of laser tissue interaction can be grouped to: photo-thermal, photo-chemical and photo-physical. The effect of heat on biological tissue depends on the duration and peak value of tissue temperature achieved. The effect of heating can be seen as coagulation, which can proceed to vaporization. Photo-chemical effect is clearly and quickly seen in 1 microsecond, but the final effect of laser radiation can be seen after some months.

The goal of laser surgery is to excise or ablate, or both, the target tissue, and to damage as little as possible the surrounding tissue. The surgeon usually wants to maximize tissue removal while minimizing thermal injury. Understanding the principles of heat dispersion, based on the wavelength, power and duration of action is essential for determining the technique for a given indication.

The aims of this study were to appreciate advantages of oral lesions treatment with laser surgery and quality of wound healing in accordance to the treatment protocol.

Methods and Results
20 cases have been treated with laser surgery at the University Dental School in Tirana, Albania. They were all treated on the outpatient basis, under a diagnostic and therapeutic protocol (Figs. 1-3). The treated oral lesions
were: mucocele (1 case), fibromas of the tongue (4 cases),
fibromas of the alveolar process (4 cases), frenectomy
(3 cases), epulis (2 cases), pigmented lesions (4 cases),
corneum cutaneum (1 case), and implant exposure (1 case).

The following therapeutic protocol had been chosen:
a. a local anaesthesia;
b. a specified surgical technique;
c. technical data of the intervention.

Local anaesthesia has been used in all cases. Basic surgical techniques were: ablation, incisional and
excisional techniques, and photo-coagulation. Technical
data were: power (watt) mode of radiation (continuous
wave or pulsed).

In 13 cases, excisional technique 6 watt, pulsed
mode was used. At first, the lesion would be outlined
with individual pulses to mark the incision line prior to
excision (mucocele, fibromas, and implant exposure).
After the lesion’s depth has been reached, it was
undermined and completely removed.

In 3 cases (prominent fraena) the incisional
technique was used, with 4 watt pulsed mode. Removal
of prominent fraenum is one of the simplest, quickest and
most effective procedures that can be performed with laser
surgery. The fraenum is incised using pulsed mode to lyse
the fibrous band.

In 4 cases (pigmented lesions) the ablation was used
with 5 w pulse mode. The objective of ablation was to
selectively remove parts of all of the mucosa according to
the operator’s choice. Usually, only the surface epithelium
was removed. Removal had stopped at about the level of
the basement membrane.

Sutures were not used in any cases.

All surgical techniques were quick, painless and
bloodless. So, laser surgery was a comfortable not
only for the patient but also for the surgeon. Wound
healing followed after 1 week, 1 month and 3 months.
The postoperative wounds looked like craters with
shining smooth surface and brown margins due to the
Figure 2. Opectectomie. (a) before the treatment; (b) after the completion of treatment; (c) the wound after 1 month

Figure 3. Vascular malformation of labio-buccal sulcus. (a) before the treatment; (b) after completion of the treatment; (c) the treated area after 21 days
thermal effect in the tissue from the radiation; they were completely bloodless. After 1 week we could see the fibrin coagulum and the wound looked yellow in colour. Healing was complete (by re-epithelization in less than 14 days for moderate sized lesions (pigmented lesions, corneum cutaneum, prominent fraenum, implant exposure) and approximately 3 weeks for large lesions (fibromas, gingival hyperplasia). After surgery, all patients hadn’t postoperative swelling or pain. No scarring occurred.

Discussion

The laser has become a useful tool in the surgeon’s armamentarium. In addition to being adjusted to conventional surgical methods, lasers are now the treatment of choice or the sole treatment modality for a variety of pathologies.

Nowadays, the use of laser surgery gives us a possibility to perform an intervention painless, bloodless, and comfortable, without postoperative swelling compared to other conventional technique. There are different laser systems with different technical data. So, it is important for the surgeon to know exactly the physical principles of laser radiation and to apply them correctly in each clinical case.2,3,5

Many attempts have been made to qualify and quantify the dynamics of healing after the use of laser on a variety of tissues. Healing in all cases is just the same with data documented in the literature4,11,14,15. In 20 cases a good healing was evident, painless (or with minimal pain), without swelling or scarring.

After 3 months, the treated tissues were normal in colour and consistence, without loss of function and recurrence.

Laser surgery is comfortable not only for the patient, but also for the surgeon.

References