

Use of a diode laser in an excisional biopsy of two spoonlike neoformations on the tongue tip

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Abstract. The 810 nm diode laser, due to its high affinity with haemoglobin (elective chromotophore) revealed, by itself, as elective instrument for surgical excision of the tongue, an organ highly vascularized and sensitive to the laser cutting action. The advantages for its use, with respect to the traditional cold blade surgery, are its haemostatic effect (which avoids to close wounds by stitches) and, not less important, the decontaminant effect of the laser ray, due to either the thermal raising created on cutting line and/or the specific selective action exerted on the bacterial membrane by its wavelength. Finally, the analgesic effect of the diode laser contributes to consider this kind of procedure more comfortable for the patient who often roundly requires its use. (www.actabiomedica.it)

Key words: diode laser, oncologic surgery

Introduction

The patient B.G. came into our clinical check showing two little tumours (about 5 mm and 3 mm in diameter) at the tip of his tongue, mourning a bothersome burning together with a feeling of recurrent pain. He referred, moreover, to have noted the two neoplastic formations with tendency to grow, even if in a light manner. The appearance of the button-shaped neoformations is showed in Figg. 1 to 4. At a greater enlargement, it is possible to note, in both lesions, a distal fringe area of erosion.

Surgical Procedure

We performed the surgical session using a 810 nm diode laser neither with an antibiotic coverage nor prescribing any analgesic drug after the surgical session.

In Fig. 5 is shown the laser equipment used during our surgical session: a combined laser ERBIUM & DIODE "Doctor Smile" device from Lambda s.p.a., Brendola (VI), Italy.



Figure 1. The appearance of both button-shaped neoformations on the tongue tip



Figure 2. The appearance of both button-shaped neoplasms on the tongue tip



Figure 4. The appearance of both button-shaped neoplasms on the tongue tip



Figure 3. The appearance of both button-shaped neoplasms on the tongue tip



Figure 5. The used laser equipment

The equipment showed in Fig. 5 proved to be more versatile because of its possibility to change the wavelength during the surgical session by simply act-

ing on the “touch screen”. With the same device it is possible an odontostomatological surgical autonomy due to its ability to treat both soft and hard tissues. In

the reported clinical case we used only the Diode Laser as it resulted able to individually manage the whole surgical session.

Anesthesia has been made using Oraquix (prilocaine 2.5 % and lidocaine 2.5 %) (Fig. 6) in contact along about 10 min (Fig. 7) and also applied during the surgical session when a feeling of pain was referred by the patient. A preliminary irradiation with our diode laser (7W-CW- 300 micron fiber- about 2 min), with “grass mowing” movements in order to induce a further analgesic effect (“Firing” inhibition of peripheric nociceptors) due to the selective blockade of the Na/K pump.

We performed the surgical excision of the first button-like neoplastic formation (about 5 mm in diameter) (Figg. 8 and 9) using the diode laser 3W,100 Hz frequency- 50% of duty cycle. In 1 second period the

diode laser gives 50% of the frequency selected irradiation and a 50% of the remaining time in order to guarantee an adequate termic relaxation to the tissue and, consequently, a reduced heating. The shown technique provides to put into traction the neoformation by an anatomic tweezers in order to put into evidence the base insertion and to make a surgical cut by laser along its perimeter. Addressing the laser fiber with an about 45° angle with respect to the tongue plane, the movements resulted continuous like a brush use and, with the traction help, we could attend to a gradual excision of the anatomic report to make biopsy without bleeding from the residual lesion nor causing painful reactions. Similar procedure was then performed on the other, more little neoformation (about 3 mm in diameter).

In Fig. 10 is shown the aspect of the operated area soon after the excision of the 2nd neoformation.



Figure 6. Local anesthetic product



Figure 8. Tongue aspect after larger neoplastic excision



Figure 7. Local anesthetic product application



Figure 9. Tongue aspect soon after smaller neoplastic excision



Figure 10. The tongue aspect soon after both neoplastic excisions



Figure 12. Clorexidine gel application

It is very clear the extremely low overrunning of the laser procedure and the conditions of the surrounding tissues which do not show any sign of inflammation.

While proceeding to the preservation of the bioptic collection (Fig. 11) the patient was dismissed without any drug prescription but only recommending the application, on the lesions, of a clorexidine gel 0.2 (Plak gel) requiring the patient to further utilize the gel for topic medication 3 times/day after his normal teeth cleaning (Figg. 12 and 13).



Figure 13. The used product

Results

The patient was controlled after 6 (Fig. 15), 14 (Fig. 16) and 30 days (Fig. 17) in order to observe results. A complete recovery was ascertained with a notable estetic impact not finding evidence of scar presence or iper/ipo chromatism outcome.

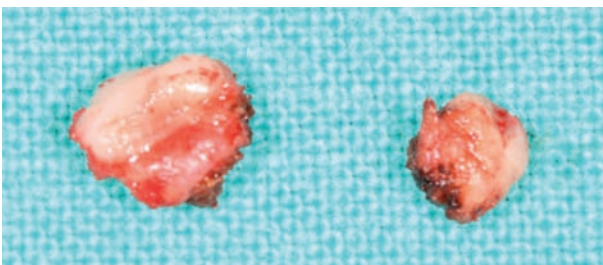


Figure 11. Bioptic collection

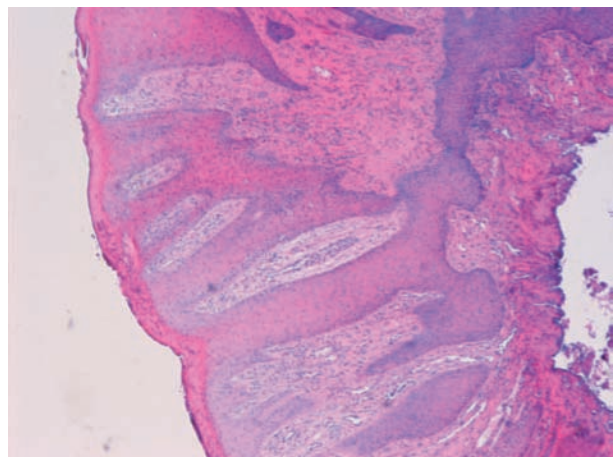


Figure 14. . Biopsy caption: Acanthosis aspects of papillary hyperplasia of squamous epithelium



Figure 15. Tongue aspect after 6, 14 and 30 days from neofornations excision



Figure 16. Tongue aspect after 6, 14 and 30 days from neofornations excision



Figure 17. Tongue aspect after 6, 14 and 30 days from neofornations excision

Conclusion

Biopsy, made by a 810nm diode laser, is preferred with respect to the traditional methods because:

- 1) It is avoided any anaesthetic infiltration (analgesic effect)
- 2) sutures were not applied (haemostatic effect)
- 3) antibiotics were not needed (decontaminant cut)
- 4) it is present an immediate functional recovery without post-operative pain (the laser biostimulation has antioedematous and antiinflammatory effects also inducing an antineuralgic bioregeneration, greatly reducing the healing time).

Furthermore, using the 3W -100Hz – 50% duty cycle protocol and cooling the cut line with saline irrigation, it is possible for the anatomical-pathologist to work on readable biopsies free of carbonization areas. During the quick recovery, the application of chlorhexidine gel, as the only local medicine, is able to preserve the wound from superinfections by opportunistic pathogens, where the laser cut already creates an high power decontaminant action. Another significant feature of the laser cutting is to induce a healing process with complete absence of scar tissue through the orderly, layer by layer, regeneration. Furthermore, the absence of inflammatory reactions and granulation phase gives the patient a perfect “restitutio ad integrum”.

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