

Effect of Er:YAG and Diode Laser Application in Removing Oral Lesion

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Introduction

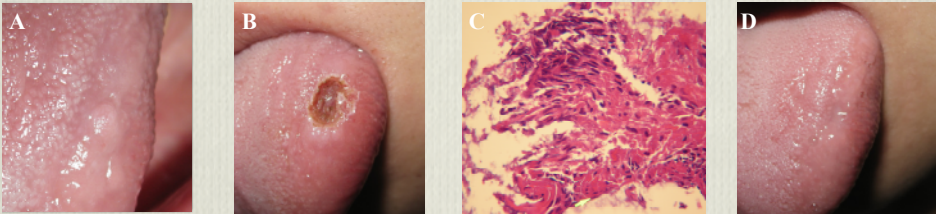
Many different laser wavelengths have been used in the field of oral surgery, especially the Er:YAG laser (2,940nm) and Diode laser (980nm) has been widely recognized in the area of medical lasers as a result of its practical characteristics. Diode laser is minimal postoperative swelling and scarring, improved wound healing, and decreased postoperative pain. Moreover, the Er:YAG laser showed satisfactory results as an adjunct to the conservative methods in the management of inflamed periodontal tissue, endodontics, peri-implant tissue, high incision quality, coagulation properties, excision biopsies, and the postoperative benefits as well. However, in histopathological examination, diode laser was found more cells with shrinkage, disruption and crush than the Er:YAG laser in the cutting margin.

Case Report

Case 1 – Diode Laser

A 33 years old female was referred to the hospital. A 10x8mm tumor was appeared on the left tongue (Fig. 1-A). The laser equipment was defined by the manufacturer as a Diodent Micro 980 device. The fibroma was used with topical anesthetic gel, benzocaine 20% after 1 min application. The diode laser fiber was applied almost vertically and anteriorly to the junction with the healthy tissue. The design of the excision was ovoid allowing easy pass of the fiber-optic peripherally to the fibroma. The patient referred no pain, either intra-operative nor post-operatively and no sutures were required (Fig. 1-B). Also haemostasis was optimum immediately after the procedure. The fibroma was sent for histopathologic examination where at it was identified (Fig. 1-C). After 6 months period, the region was found completely healed (Fig. 1-D).

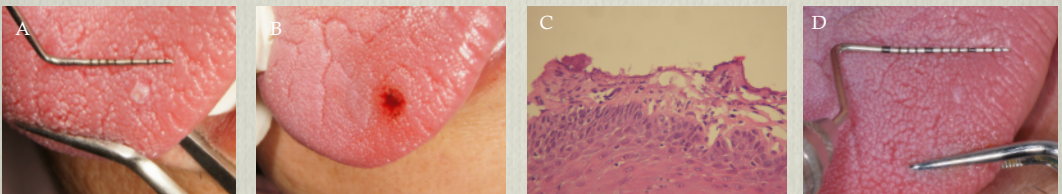
(Fig. 1)



Case 2 – Er:YAG

A 59-year-old male patient was referred with chief complaint as some keratosis tissues in the tongue area for several months. There was a rigid round lump in the patient's tongue (2.5x2.5mm) and severely restricted in movement (Fig.2-A). Before operation, the target areas were lightly painted with topical anesthetic gel (Benzocaine 20%) for one minute. The biopsy of tongue was performed with an Er:YAG laser (LiteTouch, Syneron, 2940nm wavelength) and laser energy with 200mJ at 35Hz (tip diameter-length: 0.6mm-17mm; distance to target: lightly contact; tip angle: 60°, water level: 62.5%). In order to minimize bleeding, the Er:YAG laser was irradiated with 50mJ at 10Hz (tip diameter-length: 1.3mm-19mm; distance to target: 10~20mm; tip angle: 60°; water level: 0%) to help coagulation (Fig.2-B). Histopathological examination revealed the mild keratinizing of the superficial squamous epithelium (Fig.2-C). A month later, no new lesions were formed on the tongue area. The lesion become much better than it was before laser treatment and the appearance was significantly improved. (Fig.2-D)

(Fig.2)



Conclusion

Current soft tissue managements have constituted the primary area for clinical usage of lasers in dentistry. Surgical biopsy is a common procedure in the field of oral surgery. The incision margin using the diode laser and the Er:YAG laser showed a precise cutting and excellent tissue coagulation in the clinical report. In histopathological examination, however, the finding is different from the biopsy in the cutting margin between using diode laser and the Er:YAG laser.

Reference:

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