Laser in second-stage implant surgery

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The usage of laser devices has provided less invasive management options for dental procedures. Thereby, the erbium laser is the most used laser in dentistry nowadays. It presents the most application possibilities since it can be used on both soft- and hard-tissues. When it comes to soft surgery, there are many indications including gingivectomy, gingivoplasty, sulcular debridement of diseased fibrous tissue, lesion removal, fibroma removal, tissue retraction, aphthous ulcers, gingival hyperplasia (excision and recontouring), crown lengthening, operculectomy, frenectomy, and photocoagulation.

In addition, the erbium laser may be used for periodontal procedures, including laser soft tissue curettage, laser removal of diseased, infected, inflamed or necrotised soft tissue within the periodontal pocket, removal of highly inflamed oedematous tissue affected by bacteria penetration of the pocket lining and junctional epithelium. In this article, we present a case where the Er,Cr:YSGG laser was used in a second-stage dental implant surgery.

Case presentation

A patient presented with dental implants previously inserted in the maxilla. Topical anaesthetic was administered before the procedure for three minutes, second-stage surgery was performed with an Er,Cr:YSGG laser (Waterlase MD, Biolase Technology, Inc., USA), using a Gold handpiece in S contact mode Z6 tip (2.78 µm, 3 W, 50 Hz, water 30%, air 15%). The settings for the procedure strictly followed the manufacturer’s instructions.

Discussion

Er,Cr:YSGG laser for soft tissue oral surgery is becoming widely used. It’s beneficial effects include sufficient haemostasis, absence of swelling and pain and precise incision margin.

When in contact with the tissue, the laser light can be reflected, scattered, be absorbed, or be transmitted to the surrounding tissues. The presence of free water molecules in biological tissue are vapourised as they absorb laser energy, causing the increase of intra-tissue pressure, producing vapour within the tissue.
and provoking “micro-explosions” that cause the mechanical breakdown of tissues and physically contribute to the ablation process. The ablated surface exhibits a microstructured appearance with minimal thermal alteration. In this laser, the photon amplification occurs through a medium of heterogeneous crystal (YSGG). This laser emits photons at 2,780 nm wavelengths and has a pulse duration of 140 to 600 µs in the repetition rate that can vary from 10 to 50 Hz. The major beneficial properties of lasers are their relatively easier ablation of soft tissues than that of mechanical instruments and their haemostatic and bactericidal effects.

There are two surgical stages for conventional implant dentistry. The first stage consists of performing the implant fixture while the second stage consist in uncovering it. The second stage is less aggressive for the patient comparing to the actual surgery but presents more pain.

Dental implants can be exposed by using scalpel, punch, electro surgery, or laser uncovering that decrease bleeding, swelling, and postoperative discomfort. Electrosurgery has frequently been employed and is capable of easily incising soft tissues with good haemostasis but unwanted thermal damage can cause delayed wound healing. The peri-implant soft tissue is of major importance in the upcoming prosthetic stages since the gingival tissue attachment around implants is one of the factors of success of implant rehabilitation, especially in aesthetic areas.

Conclusion

The advantages for laser treatment include technical simplicity, the possibility of obviating local anaesthesia, absence of postoperative pain and oedema as well as predictable results and complete tissue healing in several days, as it will facilitate rapid prosthetic rehabilitation.

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