

Diode and Er : yag laser vs. conventional technique for second stage surgery

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Background: Dental implants may be placed following single or second stage protocol during healing phase. With the second stage procedure the risk of unwanted loading is minimized, but second minor surgical intervention and more time prior to prosthetic phase are needed. The surgical exposure of dental implants can be performed using scalpel, punch, or, with less bleeding and postoperative discomfort, laser uncovering. Diode and Er : YAG lasers for soft tissue oral surgery are becoming widely used due to its beneficial effects regarding sufficient haemostasis, precise incision margin, absence of swelling and pain. The importance of the soft tissue-implant interface is a vital element of treatment, especially when there are aesthetic and patients' satisfaction considerations.

Aim/Hypothesis: The purpose of this study was to compare diode and Er : YAG laser and conventional scalpel surgery for dental implants exposure with regard to oedema, haematoma, postoperative pain and patients' satisfaction.

Material and methods: The sample of presented study consists of 45 patients with dental implants previously inserted in the lateral mandible, 32 in the study group (16 for diode, 16 for Er : YAG) and 13 in the control group (scalpel). Local anesthetic was administered to all patients before the procedure. Dental implants in the diode study group were treated with high power diode laser (LaserHF, Hager&Werken, Duisburg, Germany), layer of (Al-In-Ga-As-P) on a (Ga-As) substrate, using wavelength of 975 nm, Fibroma removal program, and power of 5W, continuous mode with the spot size of 0.1–0.5 mm. Er : YAG study group (Light Walker, Fotona d.d., Ljubljana, Slovenia) were treated using X-Runner handpiece in QSP mode (2940 nm, 2.4 W, 120 mJ, 20 Hz, spray : air 8 : 5), with OPTOflex articulated arm and scanner-ready technology. Control group was treated using scalpel for crestal incision technique with silk sutures. Three days after the surgical procedure oedema, haematoma, postoperative pain and patient's satisfaction rate were assessed by a single examiner and using visual analogue scale (VAS) for patient's evaluation. After 3 weeks patients were recalled again to evaluate delayed postoperative complications. Statistical analysis was performed with χ^2 test for categorical and Mann–Whitney test for numerical variables. *P*-values lower than 0.05 were considered as significant.

Results: No significant differences regarding age and gender of the participants were observed between the groups. Patients in the both study group had significantly lower oedema and haematoma scores compared to the patients in the control group ($P < 0.05$), according to clinical findings. Patients in the study group reported (VAS) significantly lower pain and higher satisfaction rate compared to the patients in the control group ($P < 0.05$), with slightly better results for Er.YAG laser. There was no statistically significant difference between two examined lasers. After 3 weeks follow-up no postoperative complications or healing complications were found in both study or control group.

Conclusion and clinical implications: Diode and Er : YAG lasers can improve healing and patients' satisfaction, and minimize postoperative complications for second stage surgery. Lasers can be used as an effective modality for dental implants exposure, due to precise incision, reduced bleeding and postoperative discomfort.