

LASER EFFECTS ON ORAL SOFT TISSUE – AN IN VITRO STUDY

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This investigation evaluated incision characteristics of soft tissue damage resulting from standardized incisions in the oral mucosa of pigs using a wide range of laser modes and parameters of lasers in the near infrared and visible range. Histologic examinations were performed to verify vertical and horizontal tissue damage as well as incision depth and width.

Incision depth and width correlated positively with average power settings. Clinically, no laser damage was visible in the bone underlying the incisions in the range between 0.5 and 4.5 W. The remarkable cutting ability and the tolerable damage zone clearly show that the used lasers are very effective and useful alternatives in soft tissue surgery of the oral cavity.

Er:YAG Laser Cavity Preparation with Variable Pulsewidth: A Microleakage Study.

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The Er:YAG laser (2.94 μ m) is highly absorbed in both water and hydroxyapatite has great applicability on cavity preparation. The purpose of this study was to evaluate *in vitro* the microleakage in composite restorations performed by Er: YAG laser. Identical size class V cavities were prepared at the buccal surfaces in twenty-five bovine teeth by Er:YAG laser (Fidelis 320A, Fotona, Slovenija) with irradiation parameters 350mJ/ 4Hz or 400mJ/ 2Hz and pulse width: group 1: VSP- Very Short Pulse; group 2: SP- Short Pulse; group 3: LP- Long Pulse; group 4: VLP- Very Long Pulse and group 5: by high-speed drill (control group). All cavities were etched with 35% phosphoric acid for 15sec, washed with water, treated with adhesive system (Single Bond-3M), filled with composite resin (Z-250-3M). The specimens were stored at 37°C in distilled water and polished 24 hours later with Sof-Lex discs (3M) and thermally stressed (700 cycles/ 5(-55°C). The teeth were impermeabilized, immersed in 50% silver nitrate solution for 8 hours, embedded in acrylic resin and sectioned longitudinally with Isomet saw and exposed to *Photoflood* light (G.E.) for 10 min to reveal the stain. The specimens leakage were observed under stereomicroscope, SEM, and were double blind evaluated with scores (0-3), by 3 different examiners. The results were analyzed with Kruskal-Wallis test (p(0.05), showing no significant differences between tested groups. The morphology of cavities performed by laser showed irregular cavosurface enamel and internal walls, with more conservative pattern than conventional cavities. The laser irradiation parameters and pulse width used in this study for cavity preparation with Er:YAG have no influence on microleakage.

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