

versal cuts. Statistics and relation between the different parameters and zones of necrosis are shown and compared to standard methods such as scalpel and electrotome. Using the same pulse width we could reach a larger zone of necrosis when we used a higher repetition rate (using 300  $\mu$ s pulse from 20  $\mu$ m at 10 hz up to 125  $\mu$ m at 30 hz at 100 mj). Applying more energy per pulse the zones of necrosis decreased using same repetition rate varying the energy, i.e. using 300  $\mu$ s at 20 hz from 48  $\mu$ m at 100 mj to 26  $\mu$ m at 500mj same frequency). Using same energy and frequency setting coagulation zones increased significantly using longer pulses, i.e. 10 hz 300  $\mu$ s 100mj 20  $\mu$ m increasing at 600  $\mu$ s to 93  $\mu$ m and 1000  $\mu$ s up to 176  $\mu$ m. **Results:** Thermal side effect can be obtained either using a higher pulse width or higher repetition rates with less pulse energy. The zone of coagulation can be controlled using different settings so that the Er:YAG can be used for almost bleedless cutting.

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## Effectiveness of PDGF or Laser Application on Periodontal Diseased Root Surfaces

Watanabe H, Mahmoud HB, Ichinose S, Ishikawa I

Department of Hard Tissue Engineering (Periodontology), Graduate School, Tokyo Medical and Dental; Japan

**Objective:** Platelet strong mitogenic agent for human periodontal ligament (PDL) cells. Also laser treatment is expected to elicit growth factor (PDGF-BB) is suggested to be a potent stimulator and accelerate wound healing. Present study aims to assess effectiveness of PDGF-BB or laser application on periodontal diseased root surfaces through attachment and growth of PDL fibroblast cells. **Materials and Methods:** 20 periodontal involved and 5 healthy teeth are selected, prepared from proximal surfaces and distributed into 5 groups (10 specimens/each): I: healthy; II: untreated diseased, III: scaling & root planning (SRP), IV: SRP & PDGF-BB and V: laser treatment (Er: YAG laser; 60 mj, 10 pps with water irrigation). Fibroblasts are pooled on root specimens with a concentration of ( $5 \times 10^3 / 20 \mu$ l/ each sample). Cultures are then allowed to incubate for periods of 1, 3 & 7 day at 37°C in an atmosphere of 95% humidified air and 5% CO<sub>2</sub>. Cell counting and attached appearance of PDL cells are evaluated by SEM. Statistical analysis was done using ANOVA. **Results:** Laser treatment and SRP plus PDGF-BB samples showed a comparable positive effect as well as healthy samples, suggesting a good root surface biocompatibility due to lack of smear layer on its root surfaces. **Conclusions:** Laser treatment and PDGF-BB application showed a positive effect on adhesion and growth of cultured fibroblasts to periodontal diseased root surfaces. Thus, laser treatment or PDGF-BB application may have a promising role in clinical periodontal regeneration.

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## Histological Analysis in Ligature Induced Periodontitis in Rats Following Photodynamic Therapy

Yamada-Jr. AM, Prates RA, Suzuki LC, Villa N, Cai S, Ribeiro MS

Instituto de Pesquisas Energéticas e Nucleares - IPEN/CNEN-SP, São Paulo, Brazil

**Purpose:** Recent studies have demonstrated that a number of oral bacteria may be killed by photodynamic therapy. Photodynamic therapy is the combination of light with appropriate wavelength and a photosensitizer. The antimicrobial activity is mainly mediated by singlet oxygen and/or free radicals generated by the photoactivated sensitizer. The aim of this study was investigate the short-term histological events after photodynamic periodontal treatment. **Material and Methods:** A rat model (n = 12) was used to develop periodontal disease with a ligature in the bilateral upper second molars. One-mL of *Actinobacillus actinomycetem-comitans* suspension ( $1.2 \times 10^9$  ufc/ml) was irrigated under the cotton ligature for 3 days consecutively. After 15 days, the ligature was removed and the rats were divided into two groups. Control group consisted in scaling; PDT group consisted in scaling and use of methylene blue (0.01% w/v) as photosensitizer and a red laser with 100 mW of output power and wavelength at 660 nm. A 5 J/cm<sup>2</sup> dosage was used for 50 s of irradiation. The rats were sacrificed at days 1, 2, 3 and 7 after treatment and the maxilla were surgically removed and processed for histopathological analysis. **Results:** An inflammatory infiltrate was observed in both groups at day 1; at days 2 and 3, an improvement was observed for PDT group; Seven days after the treatment, no significant differences were detected between the groups by histopathological analysis. **Conclusion:** These results suggest that the photodynamic therapy could accelerate the course of periodontal treatment.