Clinical and Microbiological Study of Laser-assisted Periodontal Therapy

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Introduction
The scientific and clinical discussion in the last few years has been focused on laser systems as an assisted method in periodontal therapy.

Purpose
The aim of this clinical and microbiological study was to investigate the influence of various laser wavelengths on the periodontal bacterial spectrum as well as changes in clinical parameters in patients with chronic periodontitis.

Materials and Methods
Four methods were used to treat the periodontitis. SRP (control group), SRP + diode laser (980 nm), SRP + Nd: YAG laser (1064 nm) and SRP and photodynamic therapy (PDT, 670 nm). Ten patients with a total of 253 periodontal pockets were treated over a period of three months. A total of 325 microbiological samples were taken (figs.1,2) and evaluated (PCR) over the complete period of the study (before treatment, on the third and seventh day thereafter, after one and after three months). The bleeding index (BOP) was measured before treatment, after one and after three months period. For each patient a treatment method was assigned randomly by quadrants, so that in any one patient one quadrant was treated Nd:YAG laser-assisted, one quadrant diode laser-assisted, one quadrant PDT-assisted and one quadrant by SRP alone. Treatment was conducted with a power setting of 2 W, cw (fig. 3) and 75 mW in the case of PDT (figs. 4,5) for 20 seconds irradiation period.

Conclusion
This study shows that periodontal therapy assisted by PDT can offer an alternative method in the initial phase of periodontal therapy. In comparison to SRP alone and SRP assisted by high-intensity laser, PDT is able to control BOP and achieves the best results in bacterial reduction.

Results
Regarding bleeding on probing, the sites of the control group showed more bleeding compared to laser irradiated sites after three months (fig. 12). The average bacterial reduction of all bacteria investigated after treatment by SRP + PDT was the best: 87.57 % (p<0.001) on the third day, 83.74 % (p<0.05) on the seventh day, 80.11 % (p<0.05) after one month and 91.37 % (p<0.05) after three months period (figs. 8-11).

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