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Clinical efficacy of semiconductor laser application as an adjunct to conventional scaling and root planing.

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Abstract

BACKGROUND AND OBJECTIVES: The aim of the in vitro study was to examine the clinical efficacy of semiconductor laser periodontal pocket irradiation as an adjunct to conventional scaling and root planing.

MATERIALS AND METHODS: Twenty-two healthy patients with a need of periodontal treatment (15 women, 7 men, mean age 45.0 +/- 10.8 years) with at least four teeth in all quadrants, were included. All of them underwent a conventional periodontal treatment including scaling and root planing. Using a split mouth design, two randomly chosen quadrants (one upper and the corresponding lower one) were subsequently treated with an 809 nm GaAlAs laser operated at a power output of 1.0 Watt using a 0.6 mm optical fiber. The teeth in the control quadrants were rinsed with saline. The clinical outcome was evaluated by means of plaque index (PI), gingival index (GI), bleeding on probing (BOP), sulcus fluid flow rate (SFFR), Periotest (PT), probing pocket depth (PPD), and clinical attachment loss (CAL) at baseline and at 3 months after treatment. A total of 492 teeth in both groups were evaluated and differences between the laser and the control teeth were analyzed using the Wilcoxon test ($P < 0.05$).

RESULTS: Teeth treated with the laser revealed a significantly higher reduction in tooth mobility, pocket depth, and clinical attachment loss. Twelve percent of the teeth in the laser group showed an attachment gain of 3 mm or more, compared to 7% in the control group. An attachment gain of 2-3 mm was found in 24% of the teeth in the laser group and 18% in the control group. No significant group differences, however, could be detected for the plaque index, gingival index, bleeding on probing, and the sulcus fluid flow rate.

CONCLUSIONS: The higher reduction in tooth mobility and probing depths is probably not predominantly related to bacterial reduction in the periodontal pockets but to the de-epithelization of the periodontal pockets leading to an enhanced connective tissue attachment. The application of the diode laser in the treatment of inflammatory periodontitis at the irradiation parameters described above is a safe clinical procedure and can be recommended as an adjunct to conventional scaling and root planing.

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