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The purpose of this study was to compare the effects of scaling and Nd:YAG laser treatments with that of scaling alone on cementum and levels of Actinobacillus actinomycetemcomitans, Bacteroides forsythus, Porphyromonas gingivalis, and Treponema denticola. Study samples consisted of 14 patients, age 30 to 75 years, 8 females and 6 males, with a total of 150 periodontally involved sites with probing depth ≥ or = 5 mm. Group A consisted of 100 pockets that were subdivided into 4 equal groups that were treated with conventional scaling and pulsed Nd:YAG laser using an optic fiber of 300 microns and 4 different power levels as follows: Group 1: P = 0.8 W, f = 10 Hz, E = 100 mJ/pulse; Group 2: P = 1.0 W, f = 1.0 Hz, E = 100 mJ/pulse; Group 3: P = 1.2 W, f = 12 Hz, E = 100 mJ/pulse; and Group 4: P = 1.5 W, f = 15 Hz, E = 100 mJ/pulse. The time of each treatment was 60 sec per pocket in all 4 groups. Group B consisted of 50 pockets that were treated by conventional scaling alone and served as a control group. Microbiological samples from group A were collected before scaling; after scaling = before laser, just after laser, 2 weeks later, 6 weeks later, and 10 weeks later. Microbiological samples from group B were collected before scaling, after scaling, 6 weeks later, and 10 weeks later. Microbiological analysis of all samples was done by the Institute für Angewandte Immunologie (IAI) method. The effects of laser on root surfaces were assessed by SEM examination and the sample consisted of 13 teeth from 5 different patients. Four sets of 3 teeth each were treated with Nd:YAG laser using 0.8, 1.0, 1.2, and 1.5 W, respectively. One tooth was just scaled and not treated with laser to serve as a control. Microbiological
analysis of Group A samples indicated posttreatment reduction in levels of all 4 bacterial types tested compared to pretreatment levels and Group B controls. SEM examination of the specimens treated with Nd:YAG laser at different levels exhibited different features of root surface alterations.

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