

R-18. Effects of Er:YAG Laser Irradiation on Removal of subgingival calculus

In-Gu Cho*, Byung-Gook Kim, Young-Joon Kim, Hyun-Ju Chung

Department of Periodontology, College of Dentistry, Chonnam National University

The purpose of this *in vitro* study was to evaluate the efficiency of an Er:YAG laser treatment on calculus removal and the morphologic changes and hardness of the irradiated surface at different power settings.

Human periodontal diseased extracted teeth with a band of calculus were used for this experiment. Forty root slabs (5X5mm) were made and divided into control group and irradiated groups. Experimental groups were as follows; 1) control (root planing) 2) irradiated with laser at 30mJ/10pps, 3) irradiated with laser at 60mJ/10pps 4) irradiated with laser at 100mJ/10pps. Twelve root slabs embedded in resin block were used in each group. Er:YAG laser was applied under water irrigation with the tip held perpendicular to the root surface in contact mode. The treatment time was measured until the calculus was removed completely under naked eyes. The efficiency of calculus removal was evaluated by the time for removal. Morphologic changes of laser irradiated site were observed under SEM and the surface hardness was measured using a VHN tester.

The results were as follows;

1. The efficiency of laser scaling was increased with increasing the energy level of irradiation($p < 0.05$).
2. The morphologic changes such as carbonization, crater, and scale-like defects in the irradiated root surface were frequently observed with increasing the energy level.
3. The surface hardness tended to increase at 60mJ, 100mJ irradiated groups than control group. There was no significant difference between the experimental groups.

From the results on the efficiency, morphologic change, surface hardness, lower energy level (about the 30mJ in this experiment) was suggested for the clinical application of the Er:YAG laser in scaling.