

B-8. A study on morphological and component change of tooth surface irradiated by Er:YAG laser

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This study was performed to evaluate the usability of Er:YAG laser for periodontal therapy.

Forty dental root slabs(5X5mm) were made from human periodontally diseased extracted teeth and divided into control group and irradiated groups. Experimental groups were as follows; 1) control (root planing only) 2) irradiated with laser at 30mJ/10pps, 3) irradiated with laser at 60mJ/10pps 4) irradiated with laser at 100mJ/10pps. The root slabs were embedded in resin block before treatment. Er:YAG laser was applied under water irrigation with the tip held perpendicular to the root surface in contact mode.

After Er:YAG laser irradiation or planing on the root surface, morphological changes have been observed under SEM, and the micro-hardness and Calcium/Phosphate ratio were measured and compared among groups.

1. In Control group, the root surface showed directional change caused by root planing instrumentation, and the presence of smear layer, and no exposure of dentinal tubule was observed. Laser irradiated group showed surface changes with rough dentin surface of niche and depression and exposure of dentinal tubule by the elimination of smear layer.
2. The micro-hardness of root surface in the Laser irradiated group was is higher than the control group. The higher energy output was, the higher micro-hardness on root surface was shown.
3. The higher energy output was, the higher Ca/P ratio was observed. The higher Ca/P ratio in 60 mJ group and 100 mJ group are statistically significant than the values in the control group and the 30 mJ group.

This result suggests that Er:YAG laser irradiation on the periodontally diseased root surface could remove smear layer and increase the micro-hardness on root surface and Ca/P ratio which contribute to increase acid resistance of periodontally treated root surface.