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Effect of Pulse Duration of Er: YAG Laser on Dentin Ablation

Yuki NISHIMOTO[1)], Masayuki OTSUKI[1)], Monica YAMAUTI[2)], Testuya EGUCHI[3)], Yasuharu SATO[3)], Richard M. FOXTON[4)] and Junji TAGAMI[1)5)]

1) Cariology and Operative Dentistry, Department of Restorative Science, Graduate School, Tokyo Medical and Dental University
2) Department of Health Science, School of Dentistry
3) HOYA Photonics Co. Ltd. Toda Facility
4) Department of Conservative Dentistry, Floor 25, King′s College London Dental Institute at Guy′s, King′s and St. Thomas′ Hospitals, Guy′s Hospital,
5) Center of Excellence Program for Frontier Research on Molecular Destruction and Reconstruction of Tooth and Bone, Tokyo Medical and Dental University

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Abstract:
The present study examined the effects on dentin ablation efficiency arising from various pulse durations of Er: YAG laser at a fixed energy fluence. Ten flat human dentin disks were prepared and exposed to an Er: YAG laser at 1 pps for three seconds at pulse durations of 100—500 μsec with 150 mJ/pulse (40.0 J/cm^2•pulse). The depth and diameter of the ablated dentin were measured and the ablation volume was estimated. Irradiated surfaces and cross-sections were observed using a SEM. Depth of the removed dentin increased and the diameter of the spot decreased without a change in the estimated volume at increased pulse durations. SEM observation of the irradiated surfaces revealed that there were no morphological differences when the pulse duration was changed. When the specimens were cross-sectioned, the ablated dentin had a dome shape and there was a dark layer under the irradiated surface.

Key words:
Er: YAG laser, Pulse duration, Dentin ablation

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