

Author: [ADVANCED](#)

Volume Page

Keyword: [TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

ONLINE ISSN : 1881-1361

PRINT ISSN : 0287-4547

Dental Materials Journal

Vol. 26 (2007) , No. 3 p.422-428

[\[PDF \(252K\)\]](#) [\[References\]](#)**Analysis of Er:YAG Lased Dentin Using Attenuated Total Reflectance Fourier Transform Infrared and X-ray Diffraction Techniques**[Ahmed Samir BAKRY](#)¹⁾³⁾, [Alireza SADR](#)¹⁾, [Hidekazu TAKAHASHI](#)²⁾, [Masayuki OTSUKI](#)¹⁾ and [Junji TAGAMI](#)¹⁾³⁾

1) Cariology and Operative Dentistry, Department of Restorative Sciences, Graduate School, Tokyo Medical and Dental University

2) Advanced Biomaterials, Department of Restorative Sciences, Graduate School, Tokyo Medical and Dental University

3) Center of Excellence Program for Frontier Research on Molecular Destruction and Reconstruction of Tooth and Bone at Tokyo Medical and Dental University

(Received November 30, 2006)

(Accepted January 30, 2007)

Abstract:

The purpose of this study was to investigate the chemical characteristics of dentin after Er:YAG laser irradiation using various output energies with or without water irrigation. Analysis was carried out by means of attenuated total reflectance Fourier transform infrared spectroscopy (FT-IR/ATR) and X-ray diffraction (XRD). Furthermore, the relative infrared peak intensities of dentin specimens were compared statistically. Results showed that Er:YAG laser with an output energy of 100 mJ/pulse with water irrigation did not cause any detectable change in dentin. However, a higher energy output or the absence of water irrigation affected the organic portion of dentin. With XRD, no obvious phase changes were observed between the XRD pattern of the control (non-irradiated) dentin powder and those after Er:YAG irradiation—regardless of Er:YAG laser output energy or dehydration condition. It was suggested that the intrinsic water content of dentin—together with extrinsic water irrigation—were important factors to achieving the desired outcome of dentin ablation by Er:YAG laser.

Key words:

[Er:YAG laser](#), [Fourier transform infrared spectroscopy \(FT-IR/ATR\)](#), [X-ray diffraction](#)

[\[PDF \(252K\)\]](#) [\[References\]](#)



Download Meta of Article [\[Help\]](#)

[RIS](#)

[BibTeX](#)

To cite this article:

Ahmed Samir BAKRY, Alireza SADR, Hidekazu TAKAHASHI, Masayuki OTSUKI and Junji TAGAMI. Analysis of Er:YAG Lased Dentin Using Attenuated Total Reflectance Fourier Transform Infrared and X-ray Diffraction Techniques . Dent. Mater. J. 2007; 26: 422-428 .

doi:10.4012/dmj.26.422

JOI JST.JSTAGE/dmj/26.422

Copyright (c) 2009 The Japanese Society for Dental Materials and Devices



[Japan Science and Technology Information Aggregator, Electronic](#)

