ISLD

Denise

The 8th International Congress on Lasers in Dentistry

in conjunction with

JSLD since 1989

The 14th Annual Meeting of the Japanese Society for Laser Dentistry

July 31-August 2, 2002
YOKOHAMA, JAPAN

Program and Abstract

The 8th International Congress on Lasers in Dentistry
The 14th Annual Meeting of the Japanese Society for Laser Dentistry
2002 YOKOHAMA

The 8th International Congress on Lasers in Dentistry

in conjunction with

The 14th
Annual Meeting
of the Japanese Society
for Laser Dentistry

Laser Dentistry
– Revolution of Dental Treatment in New Millenium –
新世紀における歯科治療の革新“レーザー歯学”

July 31-August 2, 2002
YOKOHAMA, JAPAN

P-15 Examination of Dental Hard Tissues After Short Pulse Nd:YAG Laser Irradiation: Morphological and Chemical Analysis

A. Antunes[1], S. S. Vianna[2], A.S.L. Gomes[2] , W. de Rossi[1] and D.M. Zezell[1]
[1] Center for Lasers and Applications- IPEN/CNEN, São Paulo, Brazil
[2] Department of Physics- Universidade Federal of Pernambuco, Recife, Brazil

In the course of high intensity laser irradiation, expressive chemical and physical alteration may be induced in the irradiated dental tissues. We used short pulse Nd:YAG laser, with which damage in the tissue is reduced and thermal load can be better controlled. The use of nano and picosecond pulselengh also assures better accuracy in affected zone as well a smaller deepness. In one of the experiments, specimens were irradiated with different energy densities in a unique track of the laser beam on the enamel surface. Laser parameters used were: pulse width 6ns, energy densities from 10J/cm^2 to 40J/cm^2 and focused beam diameter of 0.1cm. In this case, the area of affected zone was 3 times higher than expected. In other experiment, bursts of shorter laser pulse width were used. In this case the laser emissin was formed by bursts composed of a train of 10 pulses with 100 ns of pulse width each. Energy densities from 10J/cm^2 to 22.5J/cm^2 and a focused beam diameter of 0.06cm were used. Heat affected zone was determined by Scanning Electron Microscopy, which showed a direct relationship between energy employed and morphological changes and as a result of dental tissue damage dimension.

P-16 SEM Observation of Irradiation with the Er,Cr:YSGG Laser after Coating by 38% $Ag(Nh_3)_2F$ Solution

K. Yokoyama, Y. Kimura, J. Kinoshita, K. Matsumoto
Department of Endodontics, Showa University School of Dentistry, Tokyo, Japan

The purpose of this study was to evaluate the morphological changes of the dentine surface irradiated by the Er,Cr:YSGG laser in conbination with or without 38% $Ag(NH_3)_2F$ solution with SEM, SEM-EDX. Ten extracted human molar teeth were used in this study. They were vertically bisected, and one side of cut surfaces was coated with 38% $Ag(NH_3)_2F$ solution and the other side was irradiated by the Er,Cr:YSGG laser (Millennium, BioLase Technology, San Clemente, CA, USA) at the parameter of 2W and 20Hz after coating with 38% $Ag(NH_3)_2F$ solution. The specimens were examined by SEM, SEM-EDX. The teeth surfaces of the laser irradiation group showed much deposition of silver compounds in comparision with only 38% $Ag(NH_3)_2F$ solution-coated group. The dentinal tubules of the laser-irradiated group were closed with the melted silver compounds. We could conclude that the method of Er,Cr:YSGG laser irradiation after coating with 38% $Ag(NH_3)_2F$ solution on dentine surfaces showed the more effective treatment about prevention of caries and teeth fracture comparing with the method of coating only 38% $Ag(NH_3)_2F$ solution only.