

35. C.P. Eduardo, D.M. Zezell*

FOUSP-Faculdade de Odontologia da Universidade de Sao Paulo, Brazil
IPEN/CNEN-SP- Instituto de Pesquisas Energéticas e Nucleares -Brazil*

Experience in the area of Ho:YLF in hard tissue

A prototype of Er:Tm:Ho:LiYF₄ laser (2,065µm) was used in vitro to evaluate physical modifications in enamel and dentine of freshly extracted human teeth. High energy densities produced ablation of hard tissue, and deep perforations were obtained. Scanning electron microscopy shows homogeneous and smooth aspects of surfaces with melting and recrystallized substances. Temperature was monitored inside the pulp chamber using a thin thermocouple with no temperature rise above 3,8°C, indicating that laser parameters used are safety for pulp vitality and suggests the possibility of using Ho:YLF for cavity preparation. To verify the potential of Ho:YLF in prevention of dental caries two series of experiments were conducted. Changes in microhardness of enamel were measured in enamel cross sections irradiated with several energy densities. The Knoop hardness were calculated from the length of each Knoop diamond indentation in enamel and RX Fluorescence analysis were used to determine the changes in the chemical composition of irradiated samples. A study combining laser irradiation and fluoride applications in enamel was conducted in cross sections of enamel. All samples were submitted to RX Fluorescence before and after laser + fluoride treatment. The increase of concentration of calcium atoms related to phosphorous ones were measured in all irradiated samples. These results suggest the surface modification of enamel irradiated by Ho:YLF laser can be useful for prevention of dental caries.