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Root canal treatment using laser is one of the hottest topics in endodontics. Recently, a fine flexible quartz fiber has been developed to transmit a laser beam and concentrate it on a specific area. It can be inserted into the narrow root canal. However, it is still difficult to irradiate laser to the whole canal walls, because laser beam advances straight. In this study, the fiber tip was preliminarily processed to irradiate Nd: YAG laser to the root canal wall. An optical fiber (diameter 400μm) made of quartz and a Nd:YAG laser system (DENTAL LASER DL-1, Mani Inc.) were used in this study. The fiber tip was processed using a processing pad containing calcium carbonate. Then, Nd:YAG laser was irradiated, and the direction of laser beam was investigated using a power meter. Moreover, the fiber tip was observed by scanning electron microscopy (SEM). Laser beam was irradiated not only at the straight direction but also at the lateral direction. SEM observation indicated that the fiber tip was processed, as intended. Nd:YAG laser irradiation using the processed fiber tip might be useful for root canal preparation and disinfection, although more study is necessary for its clinical application.

P27

Chemical Modification of bovine dental enamel irradiated with holmiun laser .

Eduardo, P.L.P.; Bachmann, L.; Salvador, V.L.; Zezell, D.M.

This study investigated Ho:YLF (2,065 mm) effects on dental enamel with regards to the thermal variations in the pulp chamber during irradiation and resistance to demineralization. Twenty samples of bovine enamel were divided: 1) control- acidulated phosphate fluoride (APF) topic application followed by demineralization treatment with lactic acid; 2) Ho:YLF irradiation (100J/cm2) followed by APF and demineralization; 3) Ho:YLF irradiation (350J/cm2) followed by APF and demineralization; 4) Ho:YLF irradiation (450J/cm2) followed by APF and demineralization. All samples were quantified according to their calcium and phosphorous atoms relative concentrations before and after the treatments. X-Ray fluorescence spectrochemical analysis showed an increase on the calcium and phosphorous atoms concentration ratio and therefore the enamel demineralization reduction as a result of the lactic acid treatment in the samples irradiated with the holmium laser followed by the APF (ANOVA, Tukey $p<0,01$). To evaluate the feasibility of this study for clinical purposes, surfaces morphology were analyzed. Modifications were characterized by melted and re-solidified regions of the enamel, which can changes its permeability and solubility. Temperature changes of ten human pre-molars teeth irradiated with 350 J/cm2 and 450 J/cm2 were also monitored in the pulp chamber in real time. Temperature increases were limited to 4,2° C.

P28

Effects of Nd:YAG and diode laser irradiation of the root surface: Morphological analysis.

Fukuda, M.; Aoki, T.; Suzuki, S.; Sanaoka, A.; Ting, C-C.; Monguchi,T. .

The aim of this study was to evaluate morphological alterations of root surfaces after Nd:YAG and diode laser irradiation. Methods: Root specimens obtained from extracted periodontally involved teeth were sliced and polished. Root surfaces were irradiated by Nd:YAG laser (1064nm) at energy of 2.0W (100mJ/20pps, 200mJ/10pps) or by diode laser (805nm) at energy of 2.0W (10W/20%, 20W/10%). The laser profile microscope was used for evaluation of root surfaces roughness. Results: The roughness of root surfaces was expressed by roughness average (Ra) value. The Ra value of the polished root surfaces was 1.02. The Ra values of the root surfaces which was irradiated using Nd:YAG laser were 1.56, 2.40, and the Ra values of diode laser were 1.37, 1.27. In addition, the Ra value of root planing using a scaler was 1.30. Conclusions: The Ra value of the root surfaces which were irradiated by Nd:YAG laser at 200mJ/10pps was the biggest in all of the test. However, no significant difference was observed between Nd:YAG laser at 100mJ/20pps, diode laser and root planing.

P29

Intrapulpar temperature variation in primary teeth during cavity preparation using: Er:-YAG laser and conventional high-speed drill.

Fernandes, A.S.F.; Navarro, R.S.; Gontijo, I.; Haypek, P. ; Zezell, D.M.; Haddad, A.E. .

Increases of temperatures superior than 5-5.5°C can compromise the pulp vitality. The purpose of this in vitro study was to com-