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CHEMICAL EFFECTS OF Er,Cr:YSGG LASER IRRADIATION ON INTRACANAL DENTIN AND THE INFLUENCE OF TUBULES ORIENTATION

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The purpose of this study was to evaluate the compositional changes at intracanal dentin after Er,Cr:YSGG laser irradiation, when the irradiation was performed orthogonally or parallel to the tubules. Intracanal dentin was obtained from single root teeth, splitted longitudinally in two samples, in a total of 6 samples. The control and the irradiated samples were obtained from the same root specimen at same region, but in opposite sides. The irradiation was performed by an Er,Cr:YSGG laser (2.78 μ m, 20Hz, 600 μ m diameter). The handpiece was fixed perpendicularly to the sample, with movement controlled by an X-Y motor, avoiding overlapping or unlased regions by irradiating each sample 3 times. Infrared absorption spectra were recorded by using a FTIR spectrometer (ThermoNicolet 6700) accomplished to a micro-Attenuated Total Reflection accessory, to analyze the compositional changes occurred. The phosphate, carbonate, amides, hydroxyl and water bands were monitored between 4000 cm^{-1} to 400 cm^{-1} . Spectra of irradiated intracanal dentine showed changes regarding the control, as well as there were differences between the spectra of samples irradiated orthogonally or parallel regarding the direction of tubules. These results indicate that there are important differences in the way the laser beam hits the inner canal surface which can direct the choice of the best laser tip to be used.