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Microleakage of Class V Restoration prepared by Er Cr: YSGG Hydrokinetic Laser with and without conventional Acid-Etching

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The purpose of this study was to assess the effect of acid etching in the microleakage pattern of class V restorations prepared with Erbium Cr: YSGG Hydrokinetic laser.
Sixteen Class V cavities were prepared on the buccal surface of sound premolars which were extracted for orthodontic reasons. The premolars were prepared under the following conditions: 6 Watt laser output of 20 Hz, 61% H_2O spray and full air, with pulse 0,14-0,2 sec. The surface of the laser beam was 0.442 mm^2. The photons were transmitted through a flexible fiberoptic system to a crystal et saphire 0,75mm of diameter.
The handpieces which were used, were WEBER-HABER handpieces for Biolase with 360 rotation. The curvical margins were placed on dentin. Half of the specimens were subjectent in additional total etch treatment with scotchbond 1 adhesive and Z100 composite of 3M. The teeth were immersed in water for three days and then in 1% eosin solution for one week.
The teeth were sectioned as we can see in the slides, and the extend of marginal leakage was observed at the insical (enamel) cavity walls. At the servical walls (dentin) greater leakage was observed in the group with the acid etch. The observation has a probability [P<0.05].
These results show that the hydrokinetic laser (Millennium of Biolase) treatment produce a more compatible bonding to the setting shrinkage forces development by light-curing. Thus we have a more efficient marginal integrity preservasion.

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Morphological and Thermal Analysis of Resolidified Dental Enamel Surface after DYE assisted Irradiation with A960nm Diode Laser

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Previous studies with different types of lasers have shown that it is possible to effectively increase the mechanical and chemical resistance of dental enamel in order to achieve prevention against dental caries. This study examines the structural modifications induced in dental enamel under dye assisted diode laser irradiation. To allow future applications in vivo we used laser parameters which keep the pulpar temperature below the damage threshold. For this purpose we irradiated a series of ten identically prepared samples of human teeth kept precisely at 36.5°C and measured the samples temperature rise. A fine layer of chromophorous ink was applied to the enamel surface prior to irradiation with a diode laser operating at 960 nm. We used 6 Watt of peak power, 10 ms pulse duration, different duty cycles and a 340 micron diameter fiber in contact mode. The morphology of the treated samples was analyzed under SEM. The results showed a homogeneously resolidified enamel layer and almost no ablation. The temperature analysis allowed us to establish limits for irradiation time and pulse frequency of the laser. We conclude that this high power diode laser can promote fusion of the enamel surface accompanied by only a negligible temperature rise.