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WORLD FEDERATION FOR LASER DENTISTRY  
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D.M.Zezell\* 30 July (Day 3) Hall C 09:15 - 09:30

Influence of Er,Cr:YSGG laser on incipient caries development and on fluoride retention in vitro

This study evaluated the effects of Er,Cr:YSGG laser (2.78 micrometers) and topical acidulated phosphate fluoride (APF: 1.23% F-) application on enamel demineralization and on fluoride retention in vitro. 100 human enamel slabs were randomly divided into 8 groups: G1 – untreated; G2 – treated with APF for 4 minutes; G3, G4 and G5 – irradiated with Er,Cr:YSGG at 2.8 J/cm<sup>2</sup>, 5.6 J/cm<sup>2</sup> and 8.5 J/cm<sup>2</sup>, respectively (pulse duration: 140 microseconds; beam spot size: 750 micrometers); G6, G7 and G8 – pre-irradiated with Er,Cr:YSGG at 2.8 J/cm<sup>2</sup>, 5.6 J/cm<sup>2</sup> and 8.5 J/cm<sup>2</sup>, respectively, and subjected to APF application. Samples were submitted to a pH-cycling model, after ten days the mineral loss and the retention of loosely bound fluoride (CaF<sub>2</sub>) and firmly bound fluoride (fluorapatite) were evaluated. Calcium, inorganic phosphorus and fluoride contents were also evaluated in the demineralizing and remineralizing pH-cycling solutions. The statistical analysis (ANOVA-Tukey) evidenced that fluency of 8.5 J/cm<sup>2</sup> reduced the mineral loss when compared to the untreated group; however, this mineral loss was similar than that showed by APF application. Laser irradiation did not increase the fluorapatite formation, however, promoted an increase in CaF<sub>2</sub> retention. The analysis of pH-cycling solutions showed higher formation and retention of fluoride on laser samples. On conclusion, although the

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