

Evaluation of mineral content of enamel prepared by erbium, chromium:yttrium–scandium–gallium–garnet laser

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Abstract The aim of this study was to evaluate the mineral content of enamel etched at two different power settings with an erbium, chromium:yttrium–scandium–gallium–garnet (Er,Cr:YSGG) laser. Buccal, lingual and mesial or distal surfaces of five premolar teeth were cut, and three enamel slabs were obtained from each tooth. Fifteen enamel specimens were divided into three groups (1 W, 2 W and control) of five specimens each and subjected to Er,Cr:YSGG laser. The mean percentage weights of the five elements [calcium (Ca), potassium (K), magnesium (Mg), sodium (Na) and phosphorus (P)] in each slab were measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES). One way analysis of variance (ANOVA) was used to analyze differences among the groups (1 W, 2 W and control). There were no significant differences among the groups (1 W, 2 W and control) for Ca, K, Mg, Na, or P, or for the Ca/P ratio ($P>0.05$).

Scanning electron microscopy (SEM) photographs indicated that the surface irregularities increased with increased power setting. Laser treatment did not affect the mean percentage weights of Ca, K, Mg, Na, and P, or the Ca/P ratio, in any group.

Keywords Calcium/phosphorus ratio · Elemental composition · Enamel · Erbium, chromium:yttrium–scandium–gallium–garnet laser · Inductively coupled plasma-atomic emission spectrometry (ICP-AES) · Laser treatment

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