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Evaluation of the effects of conventional versus laser bleaching techniques on enamel microroughness

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Abstract

Nowadays, bleaching of the teeth within the dental office is one of the most widespread techniques to correct tooth discoloration. Variability of the materials and techniques accompanied with the trend toward esthetic restorations with minimally invasive approaches are increasing. The use of laser in this regard has also been taken into consideration. The aim of this study was to evaluate the effects of in-office versus laser bleaching on surface roughness of enamel. Fifteen freshly extracted human molars were sectioned mesiodistally to produce 30 lingual and buccal enamel blocks. Samples were mounted in transparent acrylic resin blocks and polished before treatment. Samples were randomly assigned to laser bleaching (LB) and office bleaching (OB) groups ($n = 15$ each). Pretreatment evaluation of microroughness was carried out for all samples using profilometer. Samples were treated twice in the OB group with Opalescent Xtra Boost and in the LB group using a laser-activated gel. Microroughness was evaluated after bleaching in both groups. Data were analyzed using repeated measure ANOVA. Both methods increased enamel surface roughness. Microroughness changes were significantly different between the two groups ($p < 0.05$). Microroughness significantly increased in the OB group ($p > 0.05$), but there was no significant difference in pre- and post-treatment roughness evaluation in the LB group ($p < 0.05$). Laser was considered a safer technique because it demonstrated a less surface roughness increase in comparison with the conventional office bleaching procedure.

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