

Changes in Color and Roughness with Laser Bleaching using different Peroxide Concentrations

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Purpose: The use of different H₂O₂ concentrations for in-office bleaching has been questioned. Thus, the aim of this study was to evaluate the efficiency of laser bleaching on color changes and surface roughness of bovine enamel with different peroxide concentrations.

Materials and Methods: Forty eight bovine incisors cleaned and labial surface polished up to #1200. Half of them were artificially stained with black tea and divided into three subgroups and bleached according to the concentration of H₂O₂ (15%, 25% and 35%) (n=8). Specimens were bleached with laser hybrid system (DMC Whitening Lase II, Sao Paulo, Brazil). CIE Lab color system was used to evaluate color using Vita Easyshade Spectrophotometer (Ivoclar Vivadent, Liechtenstien). The remaining specimens were used for surface roughness evaluation following bleaching. The enamel roughness (Ra) values were measured by Stylus Profilometer (Suf-Corder SE 1200, Tokyo, Japan) and Atomic force microscopy (AA3000, Bostan, USA) before and after bleaching. Data were analyzed with Paired sample T-test to evaluate color changes and Ra values at each concentration. ANOVA and Tukey test were used to evaluate the difference between the groups with different bleaching agent concentrations. All tests were computed at 5% significance level.

Results: Significant increases in degree of lightness (L*) values observed following bleaching at all concentrations. Different concentrations of peroxide produced significantly different (Ra) values. Bleaching with 35% agent produced significantly higher L* value than 15% but similar to 25%. Exposing enamel to high peroxide concentration (25% and 35%) significantly increased Ra value in comparison to unbleached enamel.

Conclusion: Color changes and surface roughness of bovine enamel were influenced by hydrogen peroxide concentrations of DMC laser bleaching system.

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