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Tooth Enamel Changes After Power Bleaching and Comparison Between Different Application Times

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Objectives: To investigate safety concerns with bleaching procedures by studying the effects of 35% hydrogen peroxide (HP) power bleaching on the enamel surface roughness and enamel elements composition. Materials and methods: Sound human premolars were embedded in epoxy resin and sectioned into halves. Specimens were taped to expose 2 x 2mm wide window of enamel and analyzed preoperatively under Scanning Electron Microscope and Stereomicroscope. Groups of specimens were treated as follows: Group 1- bleached with 1 application of 35% HP and cured for 3 cycles. Group 2- were subjected to 3 applications of same bleaching agents and cured for 3 cycles. The specimens were analyzed for enamel surface roughness, depth of demineralization, and enamel elements changes. Results: Surface roughness: SEM showed little or no alteration in the enamel surface for both treatment modalities. Bleached enamel showed increase in staining susceptibility (median before= grade 1, median after= grade 3). Depth of enamel demineralization: SEM showed minor increase in depth of enamel porosity for both treatment modalities. Significant penetration of methylene blue dye into the enamel porosity was found. The difference between the two treatments was not statistically significant. Enamel elements analysis: no significance differences of Calcium and Oxygen were found and no significant difference between the two treatment modalities. Conclusion: Bleaching with 35% hydrogen peroxide produced desirable whitening effects with mild or little deleterious effects on enamel. However bleached enamel surfaces are more susceptible to stains than unbleached enamel.

Keywords: Power bleaching, enamel, application times, comparison

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