# Shear Bond Strength measurement of Metallic Brackets After Dental Bleaching (An In Vitro Study)

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# Abstract

Bleaching of the teeth has become a popular option for whom seeking esthetic improvement of their teeth. So orthodontists may face problem of bonding brackets to previously bleached teeth.

The purpose of this study was to assess the effect of bleaching with hydrogen peroxide on the shear bond strength and failure site of orthodontic metal brackets bonded to enamel with no-mix orthodontic adhesive. Also the effect of delay bonding after bleaching and effect of application of sodium ascorbate as antioxidant after bleaching on the shear bond strength and failure site.

Seventy-two extracted sound human upper first premolars were selected and randomly divided into six groups each with 12 teeth; one control group, four groups bleached then bonded after different storage time intervals and one group bleached then treated with sodium ascorbate before bonding. After passing 24 hours of bonding procedure, the brackets were debonded by a Tinius-Olsen universal testing machine to measure the shear bond strength. After debonding each bracket base and the corresponding tooth surface were examined under a stereomicroscope and the Adhesive Remnant Index were recorded.

The results revealed that the bleaching significantly reduced the shear bond strength when bonded immediately, 24 hours or 7 days after bleaching. However, no significant difference was found in shear bond strength between control group and bonded 14 days after bleaching group. Treating the bleached enamel surface with sodium ascorbate before bonding led to minimize the reduction in shear bond strength although there was statistically significant difference with control group.

The group that bonded immediately after bleaching showed significant difference in the failure site with predominant adhesive failure at adhesive-enamel interface and also there was a significant difference among groups that bonded at different time intervals after bleaching but there was no significant difference in

failure site between control group and bleached then treated with sodium ascorbate before bonding group.

In conclusion, bleaching reduced the shear bond strength while delayed bonding and the application of sodium ascorbate after bleaching minimized this reduction.