

Evaluation of enamel surface damage after debonding using three different pliers

(An in vitro study)

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Abstract

Debonding orthodontic attachments and removal of residual bonding material from the enamel surface include critical steps in the overall orthodontic management, because of the potential for enamel fracture, cracks, tear-out and the risk of pulp damage. Maintaining a sound unblemished enamel surface after debonding orthodontic brackets is a primary concern of the clinician.

The present study was carried out to compare the effectiveness of three different pliers in debonding stainless steel and ceramic brackets, to evaluate enamel surface damage after debonding stainless steel and ceramic brackets by three different pliers, and to determine the site of bond failure.

Sixty extracted human upper first premolar teeth were randomly divided into 2 groups containing thirty teeth each, according to the type of brackets (stainless steel and ceramic). Then according to the type of pliers used for bracket removal each group was subdivided into three subgroups (each contain 10 teeth).

After 7days of bonding procedure, the brackets were debonded using conventional debonding pliers, bracket removal pliers and ligature wire cutter, then each bracket base and corresponding tooth surface were examined by a stereomicroscope and the Adhesive Remnant Index scores were recorded. After the removal of residual adhesive by carbide bur the stereomicroscope was used to evaluate enamel surface damage.

The result of this study revealed that the number of enamel cracks that resulted from debonding of ceramic brackets was higher than that showed with the stainless steel brackets and for both types of the brackets the predominant failure site was within the adhesive itself.

In conclusion, after debonding the enamel surface damage with ceramic brackets was higher than that found with stainless steel brackets by using bracket removal pliers.