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Debonding forces applied to ceramic brackets simulating clinical conditions

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ABSTRACT

Debonding ceramic brackets is an area of concern to clinicians. Reports of enamel fractures and cracks have raised questions about the safety of the procedures used to remove these attachments.

The purpose of this study was to compare the differences between the actual forces generated during bracket removal in the clinical setting and the shear forces applied during laboratory testing. Adhesive Remnant Index (ARI) scores are presented as a percentage of the total number of teeth tested and are compared between the two types of debonding methods. The ARI scores quantitatively express where the bond failure occurs during bracket removal.

The results indicate that there is a significant difference between the mean bond strengths of the shear (107.8 kg/cm²) and the modified diametral compression (67.8 kg/cm²) forces. Debonding ceramic brackets with pliers requires the application of 30% less force to the enamel surface than debonding with the shear forces as tested in the laboratory. There were no significant differences in the ARI scores of the two groups—i.e. where the bond failures occurred.

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