Evaluation of Enamel Surface Damage Following Use of Two Different Adhesive Resins and Debonding Pliers; a Stereomicroscopic Study

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Abstract

Statement of problem: At the final stage of fixed orthodontic treatment, the debonding process has high potential in causing enamel damages especially enamel cracks. Thus, the investigation on the effective factors involves in the amount of enamel damages including the type of resin and the method used for debonding is necessary.

Purpose: The aim of this study was to evaluate and compare the number of enamel cracks and changes in cracks length following bonding with two different adhesives, and debonding with two different pliers by stereomicroscope.

Materials and method: In this interventional in-vitro study, 120 extracted first premolars were randomly divided into four equal groups of 30. The metal brackets were bonded on the teeth with two pastes self-cure composite “Concise” in the first and second groups, and No-mix composite “Unite” in the third and fourth groups. The debonding was done by means of Lift off Debonding Instrument “LODI”, in the first and third groups, and Dentaurum Bracket Removing Plier, in the second and forth groups, respectively. Before bonding and after debonding, all teeth were evaluated with stereomicroscope for comparing the changes in the number and lengths of enamel cracks. Data were analyzed using Wilcakson and Mann Whitney tests using SPSS statistical package.

Results: Statistically significant differences (p<0.001) in the number and length of enamel cracks after debonding were evident in all groups. The most increase in the number of new cracks was observed in the fourth group (p<0.05). The results indicated statistically significant difference (p<0.05) in increasing the total length of enamel cracks between group 4 and groups 1, 2.

Conclusion: The debonding procedure is principally destructive to enamel surfaces. Applying shear-peel force using bracket removing plier with Unite adhesive (group 4), increased the enamel defects compared to other combination of adhesives and debonding pliers.

Key words: Debonding, enamel crack, Bracket Removing Plier (Dentaurum), LODI, Unite, Concise


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