



Editor:
Awiruth Klaisiri,
Thammasat University, Thailand

Received: January 26, 2024
Revised: February 29, 2024
Accepted: March 13, 2024

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Comparison of the Shear Bond Strength of Compomer Bonding on Different Enamel Surface Preparations

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Abstract

Objectives: To compare the effects of etching time and bonding agent application on the shear bond strength of compomer bonding in orthodontic bite raising.

Methods: Seventy-five sectioned crown of maxillary premolar teeth were embedded in acrylic rings. The samples were divided into 5 groups according to enamel surface preparation before applying Ultra Band-Lok[®] (Reliance Orthodontic Products). Group 1: without surface preparation, Group 2: etched with 37% phosphoric acid (Kerr Gel Etchant, Kerr[®]) for 15 seconds, Group 3: etched with 37% phosphoric acid for 15 seconds, then apply bonding (OptiBond[™] FL), Group 4: etched with 37% phosphoric acid for 30 seconds and Group 5: etched with 37% phosphoric acid for 30 seconds, then apply bonding. All samples were put through the thermocycling procedure and then shear bond strength was tested using the Universal Testing Machine. The mean and standard deviation of shear bond strength were statistically analyzed with two-way ANOVA and the enamel surface was observed by scanning electron microscope at 10,000x magnifications.

Result: In Group 1, all Ultra Band-Lok[®] dislodged from the enamel surface during the thermocycling process. Consequently, shear bond strength testing could not be conducted for Group 1. The mean shear bond strength of Groups 2-5 were 19.80±7.06, 18.97±4.60, 18.04±5.09 and 16.80±5.47 MPa respectively. The mean shear bond strength of each group was not statistically significant difference ($p=0.887$).

Conclusions: Varying enamel etching times (15 and 30 seconds) did not affect the compomer shear bond strength. Furthermore, the application of a bonding agent during tooth surface preparation did not significantly improve the bond strength between the compomer and the tooth surface.

Keywords: bite raising, compomer, shear bond strength, surface preparation