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The Angle Orthodontist: Vol. 62, No. 4, pp. 275–281.

The effect of enamel preparation on the tensile bond strength of orthodontic composite resin

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ABSTRACT

The bonding of orthodontic brackets to enamel surface using bis-GMA composite resin is usually accomplished by first cleaning the tooth surface then etching with phosphoric acid. This study compared the tensile bond strength of composite resin applied to a tooth surface which had been cleansed with an air-powder polisher to that of the same resin applied to a surface cleansed using a rubber cup and pumice. A wire loop apparatus was attached to bonded orthodontic brackets and pulled in tension in order to test the adherence of the bracket to the tooth. Scanning electron microscopy (SEM) and energy dispersive spectroscopy (EDS) were used to evaluate the tooth surface to determine whether sodium bicarbonate material remained after the cleaning operation. All data was analyzed by the one way analysis of variants, the Student-Newman-Keuls test and Duncan's multiple comparison test.

No statistical differences were found between the tensile strength of the bonds on the teeth cleansed with the air-powder polisher and those cleansed with a rubber cup and pumice. However, a double exposure of the tooth to phosphoric acid may lower the tensile bond strength by a significant amount.

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KEY WORDS: Tensile bond strength, Orthodontic brackets, Air-powder polisher, Enamel surface preparation, Sodium bicarbonate residue, Orthodontic composite resin.