

INFLUENCE OF PHOSPHORIC ACID SOLUTION ON HEAT-PRESSED CERAMIC SAMPLES

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ABSTRACT

In-vitro study was conducted to evaluate the effect of Phosphoric acid with different etching periods on the shear bond strength of heat pressed ceramic samples. Fifty heat-pressed ceramic discs (IPS Empress, Ivoclar) were fabricated according to manufacturer's recommendations. Samples were divided into 5 groups (n = 10 in each group). Samples from each group were treated with 60% Phosphoric acid, using 5, 10, 15, 20, and 25 seconds, for groups 1 to 5 respectively. Morphological changes obtained with various surface treatment regimens were investigated by surface analyzer and scanning electron microscopy. Fifty additional ceramic discs were prepared and treated. The treated samples were then silanated and luted with a resin-composite luting agent (Nexus, Kerr Dental) to enamel (n = 50) and dentin (n = 50) surfaces with 10 samples for each treated group. The luted samples were then loaded to failure in a shear mode at 0.05 mm/sec cross-head speed. The differences among groups were tested for statistical significance with analysis of variance (ANOVA) at 5% level of confidence. The different surface treatments resulted in statistically significant differences for mean surface roughness and shear bond strength ($P < 0.001$). 25 seconds application time produced rougher surface (11.9 μm) than 5 seconds application time (3.7 μm). The highest mean bond strength to enamel (7.1 MPa) and dentin (3.1 MPa) was associated with 25 seconds application time. It was concluded that 60% phosphoric acid with 25 seconds application time appeared to be the most suitable etching period to produce a reliable resin ceramic bond.

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