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### **Effect of Experimental-Acid Solutions on Bond Strength of Resin Cement**

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**Objectives** To evaluate and compare the effects of experimental-acid solutions, hydrofluoric acid (HF), and sandblasting on the shear bond strength (SBS) between leucite-reinforced glass-ceramic and dual-cure resin cement.

#### **Methods**

Sixty ceramic specimens were prepared and randomly divided into six groups according to surface treatments (n=10): group C (control, no treatment); group SB (sandblasting with 50- $\mu$ m aluminum oxide particles at 10-mm distance and 2.5-bar pressure for 15 s); group HF1 (etched with 4.5% HF for 60 s followed by washing and drying); group HF2 (etched with 9.5% HF for 60 s followed by washing and drying); group Exp1 (treated with H<sub>2</sub>O:HF:H<sub>2</sub>O<sub>2</sub> (20:1:1) solution for 60 s followed by washing and drying); and group Exp2 (treated with H<sub>2</sub>O:HF:HNO<sub>3</sub> (50:1:1) solution for 60 s followed by washing and drying). Dual-cure resin cement (Multilink N) with 3-mm diameter was applied to all specimens. After 24 h of distilled water storage, the specimens were tested for SBS using a universal testing machine at a crosshead speed of 1 mm/min. Data were analyzed using one-way ANOVA and Tukey's HSD test ( $\alpha=0.05$ ).

**Results** Significant differences were observed in the mean SBS values among the tested groups ( $F(5)=7.057$ ,  $P<0.001$ ). Groups C (10.83  $\pm$ 4.04 MPa) and SB (12.72  $\pm$ 5.90 MPa) showed significantly lower mean SBS values than the acid-treated groups ( $P<0.05$ ), while there was no significant difference between Groups C and SB ( $P>0.05$ ). There were no differences among the acid-treated groups ( $P>0.05$ ). Groups Exp1 (19.28  $\pm$ 3.93 MPa) and Exp2 (19.46  $\pm$ 6.62 MPa) exhibited similar mean SBS values to the HF1 (19.10  $\pm$ 3.0 MPa) and HF2 (20.01  $\pm$ 4.29 MPa) groups ( $P>0.05$ ).

**Conclusions** Experimental-acid solutions enhanced the bond strength of the resin cement to a level comparable to that of the HF solutions. Sandblasting application did not significantly increase the bond strength of the resin cement to the glass-ceramic material.