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Physical Properties of Different Self-adhesive Resin Cements and the Shear Bond Strength on Lithium Disilicate Ceramic and Dentin

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I. Object

The purpose of this study was to evaluate the physical properties of different self-adhesive resin cements and the shear bond strength on dentin compare to conventional resin cement.

II. Materials & Methods

For this study, four self-adhesive resin cement (Rely-X Unicem (3M ESPE, USA), Embrace Wetbond Universal resin cement (Pulpdent, USA), Maxcem (Kerr, USA), BisCem (BISCO, USA)) and one conventional resin cement (Rely-X ARC (3M ESPE, USA)) were used. To evaluate the physical properties, compressive strength, diametral tensile strength and flexural strength were measured. The specimens were fabricated using Teflon mould according to manufacturers' instructions and stored for 24 hours in an atmosphere of 100% humidity. To evaluate the shear bond strength, each cements were adhered to IPS Empress II (Ivoclar Vivadent, Liechtenstein) disc and buccal dentinal surface of extracted human lower molars in 2mm diameter. Dentin bonding agent (Singlebond, 3M ESPE, USA) was applied after surface treatment only in Rely-X ARC. Physical properties and shear bond strengths were measured using universal testing machine (Z101, Zwick, Germany) at a crosshead speed of 0.5mm/min.

The physical properties and shear bond strength were statistically analyzed and compared between groups using One-way ANOVA and Scheffe post-hoc test at the 95% level of confidence.

III. Results

1. BisCem showed statistically lowest diametral tensile bond strength, compressive strength and shear bond strength. ($P<0.05$)
2. Rely-X ARC showed statistically highest flexural strength, compressive strength and shear bond strength except diametral tensile strength. ($P<0.05$)

IV. Conclusion

Within the limitation of this study, the result shows that self-adhesive resin cements represents the lower physical properties and shear bond strength than conventional resin cements.