

Dental and Clinical Dentistry 2019: Evaluation of shear bond strength of zirconia to composite resin using different adhesive systems - Sana Dibazar - Ahvaz Jundishapur University of Medical Sciences

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Background: To evaluate shear bond strength of zirconia to composite resin using different universal and conventional adhesives and a zirconia primer.

Materials and Methods: Forty zirconia blocks were fabricated of zirconium ingots (10×10×5 mm) and sintered at 1530°C for 2 hours. They were then air-abraded with Al₂O₃ particles. The specimens were divided into 4 groups and subjected to one of the following bonding agents: Futurabond U (group 1), Clearfil Universal Bond, universal adhesives (group 2), Z-Prime Plus, zirconia primer (group 3) and Adper Single Bond 2, conventional adhesive (group 4). Composite resin was then applied in a diameter of 5 mm and in a thickness of 2 mm. All the specimens were stored in distilled water at 37°C for 24 hours and then thermocycled between 5°C and 55°C for 5000 cycles with a 30-second dwell time. The shear bond strength

was then evaluated with a universal testing machine at a crosshead speed of 1 mm/min. Data (MPa) were analyzed using ANOVA and LSD test ($P \leq 0.05$). The specimens were evaluated under a stereomicroscope to determine the mode of failure.

Results: The mean shear bond strength was 16,874 MPa in group I, 13,4434 MPa in group II, 11,6500 MPa in group III and 6,8700 MPa in group IV. ANOVA revealed that the shear bond strength in group IV was significantly lower than that in other groups ($P \leq 0.05$).

Conclusion: The shear bond strength in group I was significantly higher than that in groups III and IV. So Universal adhesives could provide higher shear bond strength of zirconia to composite resin after thermocycling compared to zirconia primers.