BOND STRENGTH OF RESIN CEMENT TO MONOLITHIC ZIRCONIA DECONTAMINATED WITH DIFFERENT CLEANING METHODS

Objectives: To investigate the effect of different cleaning methods on the bond strength of resin cement to saliva-contaminated zirconia.
Materials and methods: Thirty disk-shaped zirconia specimens (Zenostar MO, Ivoclar Vivadent AG, Liechtenstein) were prepared and immersed in human saliva for 60 seconds. The specimens were randomly assigned into three groups (n= 10/group) corresponding to different cleaning methods; water-spray rinsing (control group CG), ultrasonic cleaner for 3 min (UL) and Ivoclean (IV) cleaning solution (Ivoclar Vivadent AG). Silanes were applied (Monobond Plus, Ivoclar Vivadent AG) and dried with oil-free air. Cylindrical molds were placed over the treated surfaces, filled with dual-cured resin cement (Speedcem Plus, Ivoclar Vivadent AG) and light-cured for 30s. All specimens were subjected to water thermocycling (5000 cycles, 5-55^{o}C, 30s dwell time, ISO TR 11450) and finally debonded under shear loading, applied at the zirconia-composite interface with the notched-edge blade method using a universal testing machine (Tensometer 10, Monsanto, Swindon, UK) at 1.0mm/min crosshead speed. The results of the shear bond strength (SBS) were expressed in MPa (N/mm^2) by dividing the force at break by the nominal bonding surface area of the specimens. SBS results were statistically analyzed by one-way ANOVA and Tukey post hoc tests (a=0.05).
Results: SBS after decontamination with Ivoclean (20.72±20.21 Mpa) was significantly higher than UL (16.02±4.83 MPa) and CG groups (14.84±7.71 MPa). No significant differences were found between UL and CG.
Conclusions: Ivoclean can be an effective cleaning method to improve the bond strength of resin to contaminated zirconia.

Keywords: bond strength; contamination; zirconia bonding; zirconia cleaning; saliva