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The effect of fusion sputtering surface treatment on the micro-shear bond strength of zirconia and MDP containing resin cement

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Objective: The aim of this study is to evaluate the effect of fusion sputtering surface treatment on the micro shear bond strength of zirconia and MDP-containing resin cement.

Materials & Methods: Forty zirconia discs received one of the following treatments: Airborne particle abrasion with 50- μ m aluminum oxide particles, fusion sputtering, while as-sintered specimens served as a control. Five treated surface of zirconia samples was to be examined using 3D laser scanning microscope to assess the surface roughness and scanning electron microscope to study the surface structure of each group. Half of the specimens of each group were bonded using (Z-PRIME Plus) and MDP-containing self-adhesive resin cement (Panavia SA cement plus) while the other bonded directly using only the same resin cement (Panavia SA cement plus). The specimens were thermo cycled in water for 1500 cycles between 5 and 55 $\pm$ C. Micro shear bond strength test was performed using universal testing machine until bonding failure. Failure modes and fracture surface topography will be evaluated with scanning electron microscope.

Results: The fusion sputtering surface treatment and Z-PRIME application significantly influenced zirconia-resin bond strength ($p < 0.001$). The highest mean micro shear bond strength value was observed in group C2 with fusion sputtering treatment and Z-PRIME application (26.604 ± 2.553). The lowest value was observed in-group A2 as-sintered without Z-PRIME application (4.053 ± 3.72).

Conclusion: Fusion sputtering surface treatment enhanced the micro shear bond strength of zirconia and resin cement. Z-PRIME application influenced the bond strength of zirconia even with the use of MDP-containing resin cement.

Biography

Nesma Ali Mohamed Ali Hussein, an assistant lecturer at Conservative department faculty of Dentistry Alexandria University, obtained a bachelor degree in 2011 followed by master degree in Operative Dentistry faculty of dentistry Alexandria University. She is a Member at AACD American Academy of Cosmetic Dentistry.

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