



*Effect of zirconia surface treatments on
the shear bond strength of veneering
ceramic*

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Abstract

The objective of this study to investigate the effect of surface treatments of zirconia (grinding and sandblast with 50 μ m, 100 μ m) on shear bond strength between zirconia core and veneering ceramic.

A twenty-eight presintered Y-TZP ceramic core specimens (IPS e.max ZirCAD, Ivoclar vivadent) were fabricated and sintered according to manufacturer's instructions. The core specimens were divided randomly into 4 groups, group 1: no surface treatment, group2: zirconia specimens were ground with silicon carbide paper up to1200 grit under water cooling, group3: zirconia specimens were ground and sandblasted with 100 μ m alumina, group 4: zirconia specimens were ground and sandblasted with 50 μ m alumina. Surface roughness of specimens were analyzed by surface profilometer, then veneering ceramic (IPS e.max ceramic, Ivoclar vivadent) was applied on the specimens and fired according to manufacturer's instructions. All specimens were subjected to shear force in a universal testing machine at a crosshead speed of 1mm/min. The shear bond strength values were analyzed with one-way ANOVA; the fractured surfaces were examined with a stereo-microscope to observe the failure mode.

The result of shear bond strength values in MPa were (24.75) for group 4, (17.72) for group 3, (17.68) for group2, (14.61) for group 1. The airborne-particle abrasion with 50 μ m group showed significantly higher bond strength than other groups. The airborne-particle-abraded with 100 μ m group was not significantly different from grinding group.

Within the limit of this study, the sandblast with 50 μ m alumina enhanced the shear bond strength between zirconia and veneering ceramic, and zirconia-veneering ceramic bonding is not only influenced by surface roughness of zirconia.