Evaluation of self-adhesive resin cement bond strength to yttria-stabilized zirconia ceramic (Y-TZP) using four surface treatments.


Authors: Miragaya L, Maia LC, Sabrosa CE, de Goes MF, da Silva EM

Abstract

PURPOSE: To evaluate the influence of four surface treatments on the bond strength of a self-adhesive resin cement to an yttria-stabilized zirconia (Y-TZP) ceramic material (Lava Frame zirconia).

MATERIALS AND METHODS: Forty plates (8 x 6 x 1 mm) of a Y-TZP ceramic restorative material were randomly assigned to four groups (n = 10) according to the surface treatments: control, no treatment; airborne-particle abrasion with 50-μm Al2O3; coating with an MDP-based primer; conditioning with Rocatec System. The ceramic plates treated with each of the four methods were further divided into 2 subgroups according to the resin cement tested: RelyXTM ARC (ARC, conventional) and RelyXTM Unicem (Ucem, self-adhesive). The resin cements were put into PVC tubes (diameter 0.75 mm, 0.5 mm height) placed on the ceramic plate surfaces. After water storage at 37°C for 24 h, the specimens were submitted to a microshear bond strength (μSBS) test at a crosshead speed of 1.0 mm/min.

RESULTS: The surface treatments significantly influenced the μSBS (p < 0.05). For the four surface treatments, UCem presented significantly higher μSBS than ARC (p < 0.05). For both resin cements, the best result was produced by the MDP-based primer: ARC 15.9 ± 5.0 MPa and UCem 36.2 ± 2.1 MPa. The highest μSBS values were presented by UCem on ceramic plates treated with the MDP-based primer (36.2 ± 2.1 MPa) and Rocatec system (37.4 ± 2.3 MPa).

CONCLUSION: Irrespective of the surface treatment, the self-adhesive resin
cement performed better in terms of bond strength to yttria-stabilized zirconia ceramic than did conventional resin cement.

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