

BOND STRENGTH EVALUATION OF DIFFERENT TYPES OF RESIN BASED LUTING CEMENTS BEFORE AND AFTER DYNAMIC-AGING

The aim of the present study was to evaluate shear bond strength of two different types of resin based luting cements to CAD/CAM resin composite block before and after dynamic-aging procedures.

Forty CAD/CAM resin composite blocks (Cerasmart 270, GC) with 2-mm thickness and cylindrical specimens (3,6 mm diameter, 5 mm height) were prepared using light-cure resin composite. CAD/CAM specimens divided into 2 subgroups depending on aging procedure (n=20/group). Then the specimens subdivided into 2 groups (n=10/group) based on the resin luting cement types either dual-cure composite resin luting cement (RelyX Universal, 3M-ESPE) or dual-cure self adhesive resin cement (G-Cem Link Force, GC). Surface treatment protocols are applied to the CAD/CAM blocks and composite resin blocks. After applying universal adhesive agent (Scotchbond-Universal-Plus, 3M-ESPE), in order to simulate clinically relevant luting cement thickness, selected cements were applied to between the inner surface of CAD/CAM specimens and resin composite cylindrical specimens with finger pressure. Polymerization of dual-cure luting cements were achieved using high-power LED-LCU (D-Light Pro, Gc) through the outer surface of CAD/CAM specimens for 40-seconds light irradiation time. After polymerization, the specimens were stored for 24-hour in water at 37°C. Twenty specimens were thermocycled by 5°C-55°C for 10000 cycle. Other twenty specimens were connected to the universal test machine for to evaluate bond strength of test specimens using 1 mm/min crosshead speed until bond strength failure. Dynamic-aged specimens were subjected to the same procedure.

Considering before and after dynamic-aging, two-way ANOVA showed that, there were no statistically significant difference between tested dual-cure resin composite luting cement ($p < 0,05$). However, there were statistically significant difference between tested dual-cure self adhesive resin cement ($p > 0,05$).

Dynamic-aging procedure did and did not have deleterious effect on dual-cured resin composite luting cement and self adhesive resin cement, respectively. For adhesive cementation technique, composite resin luting cement is more appropriate choice.

Keywords: CAD/CAM; composite resin luting cement; dynamic-aging; shear bond strength; short fiber-reinforced composite