Effects of surface treatments on bond strength of glass-infiltrated ceramic.

李勝揚
Lu Y-C;Tseng H;Shih Y-H;Lee S-Y

Abstract

The purpose of this study was to evaluate the effects of various surface treatments on the bond strength at the In-Ceram/resin composite interface. Ninety-eight In-Ceram specimens were divided into seven groups and exposed to various surface treatments as follows: (A) control (B) saliva contamination (C) saliva contamination plus aluminum oxide sandblasting (D) glove powder contamination (E) glove powder contamination plus aluminum oxide sandblasting (F) rough aluminum oxide sandblasting and (G) excess glass infiltration. A resin composite cylinder was cemented to each In-Ceram specimen with Panavia 21 resin luting cement. Half of the cemented specimens in each group were stored in water for 24 h, and the other half were stored in water for 2 weeks and then were thermo-cycled for 2000 cycles. Shear bond strengths (SBS) of seven specimens in each subgroup were determined and analysed using analysis of variance (ANOVA) and Tukey HSD test as well as Student's t-test. Scanning electronic microscopy was used to identify the type of bond failure. Shear bond strength was significantly decreased by saliva and glove powder contaminations ($P < 0.05$). Sandblasting treatment did not improve the saliva-contaminated specimens. However, the glove powder plus sandblasting group showed no significant difference in SBS compared with the control group. There was no significant difference in SBS between the excess glass-infiltrating group and the control group. The SBS was significantly decreased by rough aluminum oxide sandblasting ($P < 0.05$). The SBS values of groups without thermocycling were significantly greater than those of groups with thermocycling ($P < 0.05$). There were no significant differences among SBS values of the seven groups with thermocycling. Combined cohesive and adhesive bond failures were seen in every group. Various surface treatments or contaminants may significantly influence the bond strength of In-Ceram restorative in clinical use.