Immediate Repair Bond Strength of Fiber-reinforced Composite after Saliva or Water Contamination.

Abstract

PURPOSE: This in vitro study aimed to evaluate the shear bond strength (SBS) of particulate filler composite (PFC) to saliva- or water-contaminated fiber-reinforced composite (FRC).

MATERIALS AND METHODS: One type of FRC substrate with semi-interpenetrating polymer matrix (semi-IPN) (everStick C&B) was used in this investigation. A microhybrid PFC (Filtek Z250) substrate served as control. Freshly cured PFC and FRC substrates were first subjected to different contamination and surface cleaning treatments, then the microhybrid PFC restorative material (Filtek Z250) was built up on the substrates in 2-mm increments and light cured. Uncontaminated and saliva- or water-contaminated substrate surfaces were either left untreated or were cleaned via phosphoric acid etching or water spray accompanied with or without adhesive composite application prior applying the adherent PFC material. SBS was evaluated after thermocycling the specimens (6000 cycles, 5°C and 55°C).

RESULTS: Three-way ANOVA showed that both the surface contamination and the surface treatment signficantly affected the bond strength (p < 0.05). Saliva contamination reduced the SBS more than did the water contamination. SBS loss after saliva contamination was 73.7% and 31.3% for PFC and FRC, respectively. After water contamination, SBS loss was 17.2% and 13.3% for PFC and FRC, respectively. The type of surface treatment was significant for PFC (p < 0.05), but
not for FRC (p = 0.572).

CONCLUSION: Upon contamination of freshly cured PFC or semi-IPN FRC, surfaces should be re-prepared via phosphoric acid etching, water cleaning, drying, and application of adhesive composite in order to recover optimal bond strength.

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