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Effect of filling materials and cleaning agents on bond strength and adhesion interface of glass fiber post to root dentin

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The aim of this in vitro study was to evaluate the effect of different filling materials and cleaning agents on the bond strength and adhesive interface quality of glass fiber posts to primary root dentin. This study included 156 roots of bovine primary teeth which were endodontically treated and assigned to four groups according to filling materials: 1 - control (no material); 2 - Calen® paste + zinc oxide (ZO); 3 - Vitapex® paste; and 4 - Calcipex II® paste. After 7 days, the filling materials were removed and the roots were subdivided according to the cleaning agents: A - No cleaning (control); B - 70% ethanol; and C - Tergenform®. Glass fiber posts were luted using dual polymerized resin cement RelyX^{MR} ARC after acid etching, rinsing and application of the adhesive system Adper Single Bond^{TM} 2. The specimens were stored for 7 days, sectioned into 1mm slices and prepared for push-out bond strength test (n=10) and interface analysis by silver nitrate leakage (n=3). A push-out test was performed using a universal test machine (EMIC) at a crosshead speed of 0.5 mm/min. For leakage, the slices were immersed in a 50wt% ammoniacal silver nitrate solution for 24h followed by 8h in a photo-developing solution and processed for backscattered Scanning Electron Microscopy observation. Data obtained were submitted to two-way ANOVA (filling materials x cleaning agents) and Tukey tests (α=0.05). The adhesive interface between dentin/cement and cement/post were analyzed by SEM and submitted to descriptive analysis. Interaction was observed between filling materials and cleaning agents, concerning bond strength values (p=0.0043). Calen® paste+ZO with 70% ethanol (12.21±2.73) showed the highest values, significantly different from the group no cleaning agents (6.85 ± 0.98). Vitapex® (6.12±2.82; 5.73±1.79; 7.98±1.98) and Calcipex® (6.28±3.45; 8.32±5.14; 7.46±2.29) showed no significant difference between cleaning agents (no cleaning, 70% ethanol, Tergenform®, respectively). The lowest bond strength values were found for group control with Tergenform® (4.37±3.07). The amount of silver deposition varied and tracer penetration into dentinal tubules was observed. All groups showed leakage in the adhesion interface between cement resin and dentin root, regardless of the filling materials and cleaning agents studied. In conclusion, filling materials and cleaning agents influenced the bond strength and adhesive interface; when the Calen® paste+ZO was used for root canal filling the best cleaning agents was 70% ethanol; Vitapex® and Calcipex®, cleaning agents are not required; all groups showed leakage in the adhesion interface between cement resin/dentin root.