

# POSTER

## Removal of temporary cements from immediate sealed dentin: a comparison of cleaning methods.

Area: Dental Materials

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Objective:

The aim of this study was to evaluate the microshear bond strength of a composite resin cement to a pre-hybridized dentinal substrate exposed to two kinds of temporary materials; the influence of several chemo-mechanical cleaning techniques on the adhesion to previously sealed surfaces was investigated.

Materials:

Dentin surfaces of 24 human molars were exposed and conditioned with a 3-step, etch-and-rinse adhesive system for development of an immediate dentinal sealed (IDS) layer. The IDS layer on each tooth was divided into four quadrants; one of them was used as a control surface (NoT). The teeth were subsequently divided according to the type of temporary material used for contamination of the remaining three quadrants: 14 teeth were allocated to the group (NE Group) where an eugenol-free temporary cement (TempBond NE®) was used; the remaining 10 teeth were addressed for procedures involving a resin-based temporary agent (TempBond Clear®) (CL Group). Dentin surfaces were coated with the provisional cement and stored in distilled water at 37°C for 24h. After storage, the temporary cement layer was removed from each quadrant by using one of the following methods: 1) Hand-scaler [S]; 2) 50µm Al<sub>2</sub>O<sub>3</sub> air-abrasion [SB]; 3) 25µm glycine powder air-abrasion [Gly]; 4) D-Limonene chemical solvent [Or]. A new IDS layer was then created; polyethylene tubes (inner area: 1mm<sup>2</sup>) were placed on dentin surfaces and filled with a dual-cure resin cement. The luting agent was light cured for 40s; a total of 4 bonded specimens were obtained for each tooth. A universal testing machine was used for the microshear bond strength (µSBS) tests; additional samples were analyzed at SEM for visualization of conditioned surfaces. Means and SD obtained from µSBS tests were calculated; A two-way analysis of variance (two-way ANOVA;  $\alpha$ : 0,05) was carried out to detect differences among study groups.

Results:

For NE group, mean µSBS values (MPa) were: 21.6 ± 6.6 [NE\_NoT]; 20.7 ± 4.5 [NE\_Or]; 20.1 ± 6.6 [NE\_SB]; 19.1 ± 5.3 [NE\_S]; 17.8 ± 2.2. No significant differences were found among tested treatments within NE ( $p$ : 0,5493). For CL group, mean µSBS values (MPa) ranged from 15.8 ± 2.8 (CL\_S50) to 19.4 ± 2.9 (CL\_Gly). A significant difference was found among study groups within CL ( $p$ : 0.0188): cleaning of the substrate with glycine air-abrasion statistically improved µSBS values with respect to aluminum-oxide sandblasting (CL\_SB: 15.8 ± 2.8) or scaling (CL\_S: 16.0 ± 2.4).

Conclusion:

The application of the immediate dentin sealing (IDS) technique, in association with one of the tested cleaning methods, was effective for preservation of freshly-cut dentin from adverse effects of temporary materials. Best µSBS values were identified for specific temporary luting-agent/surface treatment combinations.