2021

Pre-heating of dual-polymerized resin core foundation system: Effect on micro-shear bond strength, degree of conversion and ultimate tensile strength

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IADR Abstract Archives

Preheating-Temperature Affects Nanoleakage And Degree Of Conversion Of Dual-Cured Adhesive/Resin-Composite

Objectives: To evaluate the effect of pre-heating temperature on dentinal nano-leakage (NL) and degree of conversion (DC%) of dual-cured adhesive/resin composite.
Methods: In total, 27 human-molars were divided into 9 groups (n=3/group) according to: Factor 1: Adhesive pre-heating temperature (25°C, 32°C and 40°C) and Factor 2: Resin composite pre-heating temperature (25°C, 32°C and 40°C). After removal of occlusal enamel, adhesive (Futurabond U, VOCO GmbH, Germany) was applied (20s), air-dried (5s) and light-cured (10s). Each tooth was restored with 3mm height dual-cured composite crown (Rebilda DC, VOCO GmbH), light-cured (40s) and stored (48h/37°C). Dentin slabs (2mm thickness) were immersed in silver-nitrate (24h) and photo-developing (8h) solutions. Slabs were examined under SEM (Quanta 250 FEG, FEI Company, Netherlands). Three photomicrographs were taken for each slab and the relative percentage of silver-nitrate uptake was measured using digital image analysis software (ImageJ 1.51s) and scored (0-4). Data were statistically analyzed using Jonckheere-Terpstra test (*P=0.05)*. For adhesive DC%, adhesive was applied (20s) over Potassium Bromide pellets (n=5/each pre-heating temperature), air-dried (5s), light-cured (10s) and stored dry (48h). For composite DC%, cylinders (2mmx2mm) were prepared (n=5/each pre-heating temperature), light-cured (40s) and stored dry (48h). DC% for both adhesive and resin composite was evaluated using FT-IR spectra (JASCO 6800, Japan). Data were statistically analyzed using ANOVA/Tukey HSD test (*P=0.05)*.
Results: For NL, Score 0 (64.49%) showed significant difference with Scores 1 (14.21%), 2 (11.73%), 3 (2.48%) and 4 (6.80%). Significant difference was also displayed between Scores 1 and 3. For adhesive DC%, 25°C (67.47±2.13%), 32°C (67.52±4.19%) and 40°C (68.85±6.21%) showed no significant difference. For composite DC%, only 40°C (68.61±2.91%) and 25°C (62.52±3.12%) showed significant difference. No correlation between adhesive DC% and NL (*P=0.*587) and between composite DC% and NL (*P=0.355*).
Conclusions: The pre-heating temperatures did not affect nano-leakage Score. Pre-heating of composite improved its DC%, with no influence on adhesive DC%.

Division:
Meeting: 2020 IADR/AADR/CADR General Session (Washington, D.C., USA)
Location:
Year: 2020
Final Presentation ID: 1835

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Financial Interest Disclosure: NONE

SESSION INFORMATION

Poster Session

Polymer-based Materials: General Mechanical Properties