

IADR Abstract Archives

Effect of Cross-linkers on Bond-strength and MMPs on Radicular Dentin

Objectives: Dentin endogenous matrix-metalloproteinases (MMPs) are claimed to be involved in the degradation of resin-dentin interface. The objective of the study was to evaluate the effect of different cross-linkers, carbodiimide (EDC) and dicyclohexylcarbodiimide (DCC), applied as a conditioning primer on push-out bond strength and MMPs activity on radicular dentin immediately and over time.

Methods: Root canal treatment was performed on extracted single-rooted human teeth. A 10-mm post space was prepared in each tooth. After etching with 35% phosphoric acid for 15 s, specimens were randomly assigned to different groups (N=12) according to the pre-treatment performed: 1) application of 0,5M EDC for 60s; 2) application of 0,5M DDC for 60s; 3) no treatment. Then, primer and bonding agents were applied following manufacturer's instructions (All-Bond3, Bisco). Posts were then luted with a dual-cure cement and polymerized for 40s. Slices were prepared for micro push-out test and interfacial nanoleakage after 24 hours and 1 year of storage in artificial saliva. In-situ zymograph was performed to investigate MMPs activity within the hybrid layer at baseline. Results were statistically analysed with three-way ANOVA test and Chi2 test. Statistical significance was set at $\alpha=0.05$.

Results: Statistical analysis showed that the variables pre-treatment, root area and aging significantly influenced bond-strength of the tested groups. Although there was a decrease of the bond strength over time a preservation of the bond was maintained if DCC or EDC were applied. In situ zymography quantification analyses revealed that the tested adhesive activated MMPs gelatinolytic activity, while cross-linkers application reduced fluorescence signal at the adhesive/dentin interface.

Conclusions: EDC and DCC could reduce the activity of endogenous enzymes and preserve the stability of the adhesive bond over time. Further studies are needed to better understand the role of cross-linkers in the preservation of the hybrid layer.

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SESSION INFORMATION

Poster Session

Adhesion to Radicular Dentin

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