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Title	Does gradual dehydration affect the mechanical properties and bonding outcome of adhesives to dentin? [an abstract of entire text]
Author(s)	CHOWDHURY, ABU FAEM MOHAMMAD ALMAS
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学位論文内容の要約

学位論文題目

Does gradual dehydration affect the mechanical properties and bonding outcome of adhesives to dentin? (乾燥処理時間は象牙質の物性と接着性能に影響を与えるか?)

博士 (歯学)

氏名

Chowdhury Abu Faem Mohammad Almas

Summary:

In this study, we evaluated the effects of gradual dehydration on the mechanical properties of mild two-step self-etch adhesives and dentin, and also on the micro-tensile bond Strength (µTBS) of the adhesives to dentin. For µTBS, mid-coronal dentin surfaces of twenty sound human third molars were exposed and polished with # 600-grit SiC paper under running water. The teeth were then randomly treated with Clearfil Mega Bond (MB) or Clearfil SE Bond 2 (SE2) and built-up with composite resin. After water-storage at 37° C for 24 h, µTBS of wet (SE2W and MBW; tested at 5 min after removal from the storage) and dry (SE2D and MBD; tested at 10 min) specimens were obtained by subjecting composite resin/dentin beams (1 mm²) to a universal tester at a crosshead speed of 1 mm/min. Failure modes were determined by scanning electron microscope. The changes in the mechanical properties and weight of dehydrating dentin- beams and adhesive discs were monitored over time. The µTBS data were analyzed by two-way ANOVA to demonstrate the effects of adhesive and condition followed by Tukey's test. The H, E and weight-loss data were analyzed by one-way repeated measures ANOVA and Bonferroni's test at 5% level of significance. Significant differences in bond strength were observed for adhesives (p < 0.05) and for conditions (dry vs. wet, p < 0.001). Dehydration caused significant gradual changes (p < 0.05) in the H, E and weight-loss of adhesives and dentin. However, the changes in dentin's E were not significant (p > 0.05). Gradual dehydration of µTBS testing specimens can cause significant changes in the test outcomes and should be avoided as a significant source of test variation.