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?）

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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 mm^2) 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.