

Retention Comparison of Dental Sealants Using Cured Versus Uncured Adhesive

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Objective:

This study aims to evaluate the retention differences of dental sealants when using uncured versus cured dental adhesive. This is an important consideration in pediatric patients where additional cure time may increase the likelihood of moisture contamination. The clinical success and necessity of dental sealants are well-documented in the literature, with systematic reviews and meta-analyses highlighting their efficacy in preventing occlusal cavities in children and adolescents. These findings underscore the importance of optimizing sealant application techniques to enhance their longevity and effectiveness in occlusal cavity prevention.

Methods:

Twelve previously extracted molar teeth were sectioned into two portions with an exposed, smooth, enamel, occlusal surface. Twenty-four halves were each divided into two separate corresponding groups — uncured bond and cured bond for control. The occlusal surfaces were smoothed for a fresh layer of enamel and prepared for sealant application. Both groups underwent identical surface preparation with a 37% phosphoric acid etchant applied for 30 seconds, followed by thorough rinsing, and drying. In the cured adhesive group, Optibond adhesive was applied and cured for 20 seconds. In the uncured adhesive group, Optibond adhesive was applied without curing. For both groups, Clinpro (3M ESPE) sealant was placed on top of the adhesive and cured for 20 seconds. The shear bond strength of the samples was tested to assess retention in megapascals.

Results:

Statistical analysis was conducted to evaluate the retention differences of dental sealants when using cured versus uncured adhesive. No significant difference was observed between the two groups ($p = 0.053$). Normality was confirmed for both groups with the Shapiro-Wilk test. A one-tailed two-sample t-test was performed assessing if retention for uncured adhesive is greater than cured adhesive. Analysis results: T-Value= -1.68, DF= 21, P-Value= 0.053

Conclusion:

This study seeks to provide insight into whether curing dental adhesive prior to sealant application improves retention or if uncured adhesive offers comparable performance, potentially reducing the risk of moisture contamination during application in pediatric settings.

While the results suggest a trend toward greater retention for uncured adhesive compared to cured adhesive, the evidence is not strong enough to conclusively reject the null hypothesis (p-value 0.053). Further investigation with larger sample sizes is recommended to confirm these findings and provide greater statistical power.