

Thesis Title Shear Bond Strength of Glass Ionomer Sealant to Various
 Enamel Treatments

Name Jantawadee Pattarakiattipong

Degree Master of Science (Pediatric Dentistry)

Thesis Supervisory Committee

 Siriruk Nakomchai, B.Sc., D.D.S.,
 Grad. Dip. in Clin. Sc. (Pedodontics)
 Cert. in Pediatric Dentistry, M.S.

 Choltacha Harnirattisai, B.Sc., D.D.S. (Hons.),
 Grad. Dip. in Clin. Sc. (Endodontics),
 Ph.D. (Dental science)

Date of Graduation 12 May B.E. 2540 (1997)

ABSTRACT

Currently, the manufacturer of glass ionomer sealant recommends that the enamel surface be treated only with a diluted polyacrylic acid prior to sealant application. The purposes of this study were to compare the shear bond strength of glass ionomer sealant (Fuji III) to enamel after various surface treatments and to observe the type of bond fracture occurring at the test site by a scanning electron microscope. Labial surfaces of one hundred and fifty incisor bovine teeth were ground flat and polished with pumice. After that, they were distributed at random into five groups (30 teeth each) and treated as follows: group 1) no surface treatment; group 2) air polished with 50 μ m aluminum oxide; group 3) etched with 10% polyacrylic acid; group 4) etched with 2.5% nitric acid (no rinse); group 5) etched with 37% orthophosphoric acid. Following the enamel treatments, the glass ionomer sealant was bonded to the enamel surface according to the manufacturer's

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instructions. All specimens were stored for 24 hours in 37⁰ C distilled water prior to the bond strength test. The mean shear bond strengths (in MPa) were as follows: group 1: 0.77 ± 0.33, group 2: 1.54 ± 0.66, group 3: 2.21 ± 0.48, group 4: 2.93 ± 0.52, group 5: 2.89 ± 0.52. Statistical analysis using a one-way ANOVA and Scheffe's test revealed significant difference (P < 0.01) among groups but no significant difference between group 4 and group 5. All groups showed the adhesive-cohesive failures at the test sites except group 5 that showed cohesive failure. In conclusion, 37% phosphoric acid and 2.5% nitric acid (no rinse) enamel treatments provide higher bond strength of glass ionomer sealant than other enamel treatments.