

841 Confocal examination of in-vitro ceramic wear and sub-surface microstructural cracking. METMAN, T F WATSON, M J WOOLFORD

The original ceramic surface finish and its microstructure may have an effect on wear mechanisms as well as enamel loss... Confocal examination of in-vitro ceramic wear and sub-surface microstructural cracking.

842 Shear Bond Strengths of Composite Resin to Porcelain. W. P. KELSEY, M. A. Latta, C. M. STANISLAV and W. W. BARKMEIER

Porcelain restorations have become popular for the restoration of teeth. Repair of fractures with composite resin frequently results in separation of the repaired segment. It was the purpose of this study to evaluate three resin-based products for suitability to repair porcelain as measured by shear bond strengths (SBS) of attachment.

843 Bond Strength of Composite To Enamel Using Three Adhesive Conditioners. M.A. Latta, C.M. Stanislav and W.W. Barkmeier

While most adhesive systems rely on an acid treatment prior to application of an adhesive primer, some newer systems employ a no-rinse "self-etching" primer. The purpose of this study was to evaluate the shear bond strength (SBS) of composite to both ground and intact enamel using both phosphoric acid and self-etching primer systems.

Table with 4 columns: Intact enamel, Group A, Group B, Group C. Rows: SBS in MPa (Mean ± SD), P-value.

SBS in ground enamel was higher (p<0.05) than intact enamel for each group. There was no statistical difference (p>0.05) for SBS among the groups on ground enamel.

844 Tensile Properties of Demineralized Dentin Matrix After 48 Months. R.M. Carvalho, F. Tay, H. Sano, M. Yoshiyama, D.H. Pashley

Incomplete resin infiltration of the demineralized zone during hybrid layer formation may leave the collagen matrix exposed to the degrading action of water and hydrolytic enzymes. Storage of demineralized dentin in saline for 18 months did not cause any significant decrease of its tensile properties.

Table with 3 columns: Tensile Properties, 24 hrs, 18 months, 48 months. Rows: UTS, F.

The tensile properties of demineralized dentin matrix after 48 months of storage were not statistically different from the values obtained at 24 hrs. Storage of demineralized dentin matrix for 48 months in saline did not cause any decrease of its tensile properties.

845 Bonding Mechanism and Micro-Tensile Bond Strength of a 4-MET-based Self-Etching Adhesive. B. Van Meerbeek, Y. Yoshida, S. Inoue, M. Vargas, Y. Abe, R. Fukuda, M. Okazaki, P. Lambrechts, G. Vanherle

Self-etching adhesives are clinically less technique-sensitive because they do not require a rinsing step in their application procedure. The aim of this study was to analyze the mechanism of bonding of a two-step 4-MET-based self-etching adhesive (UniFil Bond, GC) to dentin ultra-morphologically by TEM and AFM, and chemically using XPS.

Table with 4 columns: μTBS in MPa, Deep dentin (<2 mm), Middle dentin (2-3 mm), Superficial dentin (>3 mm). Rows: UniFil Bond, OptiBond FL (control).

statistically different from the control (student's t-test; NS at P=0.05). It is concluded that the bonding mechanism of UniFil Bond to dentin is mixed. Micro-mechanical bonding was established by monomer interdiffusion into a shallow partially demineralized dentin layer.

846 Microtensile Bond Strength of Glass Ionomer Cement to Dentine. M. Tanumiharja, M. F. Burrow, M. J. Tyas

Various pretreatments have been recommended prior to the placement of glass ionomer cements (GICs). This study evaluated the effect of Ketac Conditioner (Espe; 25% polyacrylic acid (PAA)), Dentin Conditioner (GC; 10% PAA), Cavity Conditioner (GC; 20% PAA, 3% aluminum chloride), and an experimental conditioner K930 (GC; 12% citric acid, 4% Al chloride) on the microtensile bond strength to human dentine of a self-cure GIC (Fuji IX GP, GC) and two resin-modified GICs (Fuji II LC, GC; Photac Fil Quick, Espe). Specimens were stored in water (24 h/37°C), shaped in a 'hour-glass' form of (1.2 ± 0.2) mm dia. and stressed in tension at a cross-head speed of 1 mm/min.

Table with 4 columns: Bond strength (SD), MPa (N=10). Rows: Photac Fil Quick, Fuji II LC, Fuji IX GP. Rows: Control, Ketac Conditioner, Dentin Conditioner, Cavity Conditioner, K-930.

Values with the same letter are not significantly different (P > 0.05). Microtensile test values are higher than conventional tensile values. The lack of effect of conditioner on the bond strengths of Photac Fil Quick and Fuji IX GP may be because the free acids in the mixed cement act as self-conditioners.

847 Fractographic analysis of dentin bonded with a moist or dry technique after microtensile bond testing. CKY YIU, NM KING, FR TAY, DH PASHLEY

This study tested the null hypothesis that application of simplified-step adhesives with a moist or a dry bonding technique produce the same failure modes following a non-rinsing microtensile bond-testing (μTBS) method. Eight extracted, caries-free, human third molars were divided into four groups. The occlusal enamel was removed, leaving a flat dentin surface for bonding.

848 Adhesion of contemporary glass ionomer cements used in sound dentin. HK Yip, FR Tay, H Ngo, RJ Smales, DH Pashley

This work investigated the microtensile bond strength (μTBS) of contemporary glass ionomer cements (GIC) to sound coronal dentin. The coronal enamel of extracted human third molars were removed, leaving flat dentin surfaces for placement of the GICs. Three teeth were prepared for each material tested: ChemFlex (Dentsply), Fuji IX (GC), Ketac-Molar (Espe). GIC buildups were made according to the manufacturer's instructions. After being stored at 100% humidity for 24 h, the teeth were vertically sectioned into an array of 0.9mm x 0.9mm composite-dentin beams.