

Oral Presentation VI

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Study of interface between light-cured glass ionomer base and resin cement according to different storage periods

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I. Objectives

This study was done to evaluate the shear bond strength between light-cured glass ionomer cement base and resin cement for luting indirect resin inlay and to observe bonding aspects which is produced at the interface between them by SEM(Scanning Electron Microscope).

II. Materials and Methods

1) Shear bond strength

Light-cured glass ionomer cement base were made in plastic molds (10 mm diameter, 5 mm thickness). Two type of light cured glass-ionomer cement were used. : Fuji II LC Improved (GC Co. Tokyo, Japan) and Vitrebond™ (3M, Paul, U.S.A). Specimens were immersed in 36°C distilled water for 1 hour, 24 hours, 1 week and 2 weeks respectively. They were randomly assigned to the different storage periods described above. Eighty resin inlays (5 mm diameter, 7 mm height) were made with Artglass® (Heraeus Kultzer, Germany). Resin inlays were luted to light cured glass ionomer cement bases with Variolink® II (IVOCCLAR VIVADENT, Liechtenstein).

Shear bond strength of each specimen was measured using Instron universal testing machine (Model 4302, Instron, U.S.A) and fractured surface were examined. Statistical analysis was done with one-way ANOVA and Student-Newman-Keuls test.

2) SEM observation

Twenty-four extracted human third molars were selected and Class II cavities were prepared on the teeth. Two type of light-cured glass ionomer cement based at axio-pulpal lineangle according to manufacturer's instruction. The specimens were immersed in 36°C distilled water for 1 hour, 24 hours, 1 week and 2 weeks respectively. They were randomly assigned to the different storage periods. The resin inlays were luted to prepared teeth. The specimens were embedded in acrylic resin and sectioned vertically with low speed saw (Isomet™, Buehler, U.S.A). The bonding aspect of the specimens were observed using scanning electron microscope (JSM-5400®, Jeol, ToKyo, Japan).

III. Results

The results were as follows.

1. The shear bond strengths of Fuji II LC Improved groups immersed for 1 hour, 24 hours, 1 week and 2 weeks were 14.00, 12.08, 15.15 and 14.80 MPa respectively.
The shear bond strengths of Vitrebond™ groups immersed for 1 hour, 24 hours, 1 week and 2 weeks were 15.14, 14.75, 11.98 and 13.16 MPa respectively.
2. Cohesive failure was mostly appeared in light-cure ionomer cement.
3. On scanning electron micrograph, About 20 - 100 μm of the gaps were observed on the interface between light cured glass ionomer cement base and dentin regardless of storage periods. But No gaps were observed on the interface between light-cured glass ionomer cement and resin inlay.

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no significant difference of the shear bond strength according to storage period. All specimens were showed gap formation on the interface between light cured glass ionomer cement base and dentin.

Marginal adaptation of indirect composite resin systems in three different base materials

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I. Objectives

Composite inlays are indicated for large cavities and different approaches have been proposed to improve the adaptation of Class II restorations, including applying base. The purpose of this study was to compare in vitro the marginal adaptation of class II (MOD) composite inlays (Tescera ATL system, Bisco) made with or without bases, having different physical properties.

II. Materials and Methods

Extracted human lower molars were used for this study. The base was made from Aeliteflo (Bisco), Dyract AP (Bisco) or Fuji II LC improved (GC) respectively and the control group has no base. Before and after mechanical loading (720000 cycles, with a force 5.0 kg) with the chewing simulator, the marginal adaptation were assessed by microscope. Experimental data were analysed with one-way ANOVA and t-method at the 95% confidence level.

III. Results

The results will be presented.