

Oral Presentation I

Chairman: Ho-Hyun Son (Seoul National University)

13:30-15:00 Auditorium

◆01

Effect of flowable resin composite on bond strength to wedge shaped cavity walls.

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Flowable resin composite is a relatively new restorative material. It has been reported that a low viscosity, low modulus intermediate resin applied between the bonding agent and restorative resin act as an "elastic buffer" that can relieve contraction stress. This in-vitro study aimed to evaluate the effect of flowable composite resin as a restorative material on regional tensile bond strength to cervical wedge shaped cavity walls. Wedge-shaped cavities were prepared in the buccal cervical dentin of eighteen extracted intact human molars. The teeth were divided into two groups according to the adhesive systems used (Clearfil SE Bond, SE, (Kuraray) , or One-up Bond F, OBF, (Tokuyama)). After the application of the adhesive systems, the teeth were further subdivided into two groups, and the cavities were restored with a flowable resin composite (the flowable group, Palfique Estelite LV High Flow, Tokuyama) or a hybrid resin composite (the hybrid group, Palfique Estelite, Tokuyama). After 24h in water at 37 °C, the teeth were serially sliced (0.7mm thick) and alternate sections were trimmed to form hour glass shape with 1 mm² cross-section to test either the occlusal or gingival walls of the each bonded restoration, and micro-tensile bond strengths (μ TBS) were determined (mean \pm SD MPa(n)). The data were analyzed by one-way ANOVA and Fisher's PLSD test ($p < 0.05$). NS: not statistically significantly different ($p > 0.05$).

| | SE-occlusal | | SE-gingival | OBF-occlusal | | OBF-gingival |
|----------|----------------------|----|----------------------|---------------------|----|---------------------|
| Flowable | 46.3 \pm 6.8 (13) | NS | 42.2 \pm 10.9 (12) | 32.7 \pm 9.0 (12) | NS | 30.4 \pm 5.2 (13) |
| | $p < 0.05$ | | NS | $p < 0.05$ | | $p < 0.05$ |
| Hybrid | 38.3 \pm 10.1 (13) | NS | 36.5 \pm 9.8 (11) | 26.1 \pm 8.6 (13) | NS | 20.0 \pm 3.4 (13) |

With both adhesive systems, and both restorative materials, μ TBS to the occlusal wall was higher but not significant than to the gingival wall. For both adhesive systems, and both sides of the cavity walls, μ TBS of the flowable group was higher than the hybrid group. Flowable resin composite used in this study could be recommended as the adequate restorative material for improved bonding to the wedge shaped cavity. Supported by Grant #12771140, Jpn Min of Edu.

◆02

The effect of irradiation mode on degree of cure, shrinkage and microleakage of composite resin restoration.

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The aims of this study are (1) to investigate the relation of irradiation mode, polymerization shrinkage and degree of cure of composite resin and (2) its effect on microleakage of class V restorations.

VIP (BISCO Dental Products, Schaumburg, IL, USA) and Optilux 501 (Demetron/Kerr, Danbury, CT, USA) curing lights were used for curing Z-250 composite resin following irradiation mode: VIP 200mW, VIP 400mW, VIP 600mW, pulse-delay(200mW 3 sec, 5min wait, 600mW 30 sec), Optilux C mode, Optilux R mode. Microhardness (FM 7, Future-Tech Co., Tokyo, Japan) and degree of conversion (IFS 120 HR, Bruker, Karlsruhe, Germany) were measured separately at 5, 10, 20, 40, 60 sec and shrinkage were measured by Linometer (R&B, Taejeon, Korea) continuously from 0 to 60sec. ANOVA and Duncan's multiple range test were used for statistical analysis of microhardness, FT-IR and shrinkage results at each time, and chi-square test were used for leakage test.

The results were as follows: (1) as light intensity was increased, degree of conversion and microhardness were increased, but also shrinkage of composite resin increased gradually except Optilux C mode. (2) When same energy density was irradiated on the composite resin, low intensity light showed less shrinkage. (3) Optilux R group showed less marginal leakage in dentin. (4) Curing with 200mW was not enough to cure the 2mm bottom surface of resin.

In conclusion, irradiation mode can affect the composite shrinkage and microleakage of restorations, the clinician should consider it for successful restorative treatment.