## p-29 Effect of each light curing units on the microhardness and microleakage of composite resin

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### Ⅰ. Objectives

Plasma arc curing, newly developed curing units operate at relativly high intensity and are claimed to result in optimal properties of resin composites in a short curing time. The objectives of this study was to evaluate current visible light curing units regarding microhardness and microleakage.

### Ⅱ. Materials and Methods

*Microhardness* : Fourty samples of composite resin(Z-250, 3M) were cured in acrylic blocks. Each ten samples of composite were cured by four different light curing units(Flipo,LOKKI; Credi Ⅱ,3M; XL 3000,3M; Optilux 500,Demetron). Surface microhardness was measured using a calibrated Vickers indenter on both top and bottom surfaces after 24 hours of storage in air at room temperature.

*Microleakage* : Class Ⅴ cavities were prepared on buccal and lingual surfaces of fourty extracted human molars. Each margin was on enamel and dentin/cementum. Composite resin(Z-250, 3M) was filled in cavities and cured by four different light curing units(Flipo,LOKKI; Credi Ⅱ,3M; XL 3000,3M; Optilux 500,Demetron). After thermocycling, the specimens were immersed in 0.5% basic fuchsin dye solution for 6 hours and sectioned longitudinally in a buccolingual direction through the center of the restoration. The dye penetrations at the tooth-restoration interface were examined by stereomicroscope.

Statistical analysis of the data was carried out using an analysis of variance(ANOVA).

### Ⅲ. Results

*Microhardness.* No significant differences were found on top surfaces between plasma lamp and halogen lamp. The plasma lamp yielded lower microhardness values for bottom surfaces compared with the halogen sources. There was significant differences between Flipo and Credi Ⅱ on both surfaces. The microhardness resulting from curing with Flipo was less than that of others on top surfaces except XL 3000, but there were no significant differences. The microhardness resulting from curing with Flipo was less than that of others on bottom surfaces.

*Microleakage* : Dentin margin showed significantly high dye penetration rate than enamel margin in all groups($p<0.05$). No significant differences were found on both enamel and dentin margin regarding curing units.

### Ⅳ. Conclusions

Under these experimental conditions, plasma arc curing units were shown to be inferior in the deep polymerization of resin composite compared to a traditional halogen lamp. Caution must be exercised in the plasma irradiation of resin composites as a curing method due to reduced surface microhardness value.