differences to the other groups($p<0.05$)

♦033

An in-vitro investigation of microleakage of sandwich restorations with flowable liner in class II cavaties with cervical margins in dentine

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Large butt-joint box typed class II cavites with cervical margins 1mm below the cemento-enamel junction were cut into 70 extracted human molars. The cavities(7 groups, n=10) were filled using a closed/open sandwich restoration or total bond restoration technique with materials according to the manufacturer's recommandation using the single-component bonding agent for each system. Teeth were thermocycled 500 times between 5℃ and 55℃ with 30-second dwell times. The teeth were then coated with nail polish 1mm short of the restoration, placed in a 2% methylene blue for 24 hours, and sectioned with diamond wheel. Sections were examined with a stereoscope to determine the extent of microleakage. Dentine /Cementum margins were analyzed for microleakage on scale of 0(no leakage) to 4(entire axial wall) and interface between materials, on scale of 0(no leakage) to 3 (axial wall). Results were evaluated with Kruskal Wallis Test, corrected for ties, to determine whether there were statistically significant differences among the seven groups. Pairs of groups were analyzed using the Student-Newman-Keuls Method and Dunn's Method.

The results were as follows:

1. All groups showed some micoleakage in cervical portion. But there were no microleakage in interface between materials.
2. Closed sandwich restorations with Fuji-II LC® and Filtek Flow® had significantly lower leakage rating than total restorations with only P-60®. However, open sandwich restorations with Dyract Flow(r)showed significantly higher ($P<0.05$).
3. Closed sandwich restorations had significantly lower leakage rating than total restorations. However open sandwich restorations showed significantly higher ($P<0.05$).
4. Sandwich restorations with Fuji-II LC were lower leakage than only P-60, Filtek Flow, Dyract Flow. But there were no statistically differences among the materials.

From the results above, it could be concluded, closed sandwich restorations was effective in reducing microleakage of class II restorations. The best results showing the least microleakage were for the closed sandwich technique with Fuji-II LC® and Filtek® Flow.

♦034

Microhardness and microleakage of composite resin according to the change of curing light intensity

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The selection of a curing light is a multifactorial decision. While each method of polymerization presents unique clinical benefits, the optimal light-curing technique remains to be determined.

The objective of this study was to check the difference of microhardness and microleakage according to various light intensity (50, 100, 200, 300, 400, 600 mW/cm^2) and curing time (10, 20, 40 seconds). A3 color of two composite resin, hybrid type DenFil and submicron type Esthet X were tested.

Vickers hardness was evaluated from the diamond-shaped indentation at 1 day after curing. Degree of microleakage was determined in two ways; dye penetration using 1% methylene blue solution and maximum gap measurement with a scanning electron microscope.

Although the relationship of direct proportion was not seen, curing time and light intensity were positively correlated with the increase of microhardness value, that is, the longer curing time and the stronger light intensity were, the harder surface could be obtained. This pattern was stronger in the lower surface than in the upper surface.

In the upper surface, DenFil and Esthet X could get similar microhardness values to those of control group (600mW/cm^2 for 40 seconds) if cured with the light intensity of over 200 mW/cm^2. But in case of DenFil, curing time did not make any difference, on the other hand, Esthet X should be cured for 40 seconds. In the lower surface, similar microhardness values to those of control group could be gained only if cured for 40 seconds with the light intensity of over 300 mW/cm^2 in case of DenFil and with that of over 200 mW/cm^2 in case of Esthet X. Groups cured with very low light intensities of 50 and 100mW/cm^2 showed significantly lower microhardness values ($p<0.05$) irrespective of the location of the surface and the material.

No dye penetration was done on enamel margin, but all specimens of dentinal margin had dye penetration. Lower light intensities might get similar or better microleakage results, even though there was no statistical difference. Very low correlation was noted between the techniques of dye penetration and maximum gap through SEM observation.

Within the limit of the study, Curing technique using a lower light intensity, such as 200~300mW/cm2 for 40 seconds might give similar or better result in microhardness and microleakage than currently used maximum intensity technique did.