

The influence of IRM temporary restorations on marginal microleakage of dentin adhesives

Hyun-Kyung Kim*, Young-Gon Cho

Department of Conservative Dentistry, College of Dentistry, Chosun University

I. Objectives

Eugenol is known to have a detrimental effect on both composites and dentin adhesives. This study investigated the influence of eugenol-containing temporary restoration material, IRM on microleakage of 5th generation dentin adhesives and composites to enamel and dentin.

II. Material and Methods

Class V cavities with occlusal margins in enamel and gingival margins in dentin were prepared on both buccal and lingual surfaces of 60 extracted human molar teeth. Prepared teeth were randomly divided into six groups. Group 1 and 4 received no temporary restoration with IRM. Group 2 and 5 were covered with IRM mixed at P : L ratio of 10g:1g. Group 3 and 6 were covered with IRM mixed at P : L ratio of 10g:2g. The temporary restorations were removed mechanically with an ultrasonic scaler after one-week storage in distilled water. The cavities were washed and restored using one of two adhesives and composites: Single Bond/Filtek Z 250(Group 1, 2 and 3), UniFil Bond/UniFil F(Group 4, 5 and 6).

Following one day storage in distilled water, the restored teeth were thermocycled for 500 cycles(between 5°C and 55°C) and immersed in 2% methylene blue for dye penetration testing. The results were analysed using Kruskal-Wallis Test, Mann-Whitney and Wilcoxon signed ranked test at a significance level of 0.05.

III. Results

1. Ranking of mean microleakage scores at the enamel margins was Group 1<Group 3<Group 2<Group 4<Group 5<Group 6. The microleakage of Group 6 was significantly higher than that of Groups 1, 2 and 3($p<0.05$).
2. At the enamel margins, without regard to pretreatment with IRM, the microleakage of Single Bond was lower than that of UniFil Bond.
3. Ranking of mean microleakage scores at the dentin margins was Group 4<Group 1<Group 5<Group 6<Group 3<Group 2. But there were no significant difference among microleakages of each group($p>0.05$).
4. At the dentin margins, the microleakage of the group not pretreated with IRM was lower than that of the group pretreated with IRM. And the microleakage of UniFil Bond was lower than that of Single Bond.
5. Compared with microleakages between the enamel and dentin margins of each groups, Group 1, 2, 3, 4, 5 and 6 at dentin margin were higher microleakage than those at enamel margin. There were significant difference between enamel and dentin microleakage of Group 2 and 3($p<0.05$).

IV. Conclusions

Using temporary restorations prior to composite placement should be avoided, if possible. And the influence of IRM on microleakage was different according to dentin adhesives.