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Marginal microleakage of single step adhesives

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I. Objectives

The purpose of this study was to compare the marginal microleakage of Prompt L-Pop, AQ Bond, One-Up Bond F, Futurabond, and Xeno III in Class V cavity.

II. Materials and Methods

One hundred Class V direct resin restorations were placed in the buccal and lingual surfaces of 50 extracted human molars. Each cavity had occlusal margin in enamel and gingival margin in dentin. Teeth were randomly divided into five groups and restored using one of the single step adhesives and composite resins: Prompt L-Pop/Filtek Z-250 (Group 1), AQ Bond/Metafil CX (Group 2), One-Up Bond F/Palfique Toughwell (Group 3), Futurabond/Admira (Group 4), Xeno III/Spectrum TPH (Group 5). Following 48 hours storage in room temperature distilled water, the restored teeth were thermocycled for 500 cycles between 5℃ and 55℃. Microleakage was assessed by dye penetration using 2% methylene blue dye solution. After 24 hours, the teeth were bisected buccolingually and evaluated for microleakage under steromicroscope. The data were statistically analysed by Kruskal-Wallis test and Mann-Whitney test.

III. Results

The mean microleakage of enamel margins was the highest for group 3, decreasing among groups in the following order: group 2, group 5, group 4 and group 1. Microleakage of enamel margins in group 3 was statistically higher than that in groups 1, 2, 4, 5 ($p<0.05$). The mean microleakage of dentin margins was the highest for group 3, decreasing among groups in the following order: group 1, group 4, group 5 and group 2. Microleakage of dentin margins in group 1 was statistically higher than in groups 2, 5, and that in group 3 was statistically higher than that in groups 2, 4, 5 ($p<0.05$). Dentin marginal microleakage was higher than enamel marginal microleakage in all groups.

IV. Conclusions

Prompt L-Pop was the least microleakage at enamel margin, and AQ Bond was the least microleakage at dentin margin in this study. Marginal microleakage of gingival wall in dentin was higher than that of occlusal wall in enamel.