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Microleakage of posterior packable composite resin at the gingival margins of class II cavities

Su-Jin Choi, Hyuk-Choon Kwon

Department of Conservative Dentistry, College of Dentistry, Seoul National University, Seoul, Korea

The use of flowable composite resins as liners in class II packable composite resins has been suggested by some manufacturers. However, the contributions of this technique are unproven. Objectives: The aim of this study was to compare the gingival microleakage in class II packable composite restorations with or without the use of flowable composite resins as liners.. Methods: Slot cavities were prepared on both proximals of 80 extracted human molars and randomly assigned to 8 goups of 20 each. The gingival margins were located at 1mm above CEJ in 80 cavities(group1~4) and 1mm below CEJ in 80 cavities(group5~8). The prepared teeth were mounted in the customized tray with adjacent teeth to simulate clinical conditions and metallic matrix band and wooden wedges were applied. Each group was restored with the following materials using incremental placement technique: Group 1,5(Filtek P60), group 2, 3, 4 and group 6, 7, 8 (Filtek P60/AeliteFlo, TetricFlow, Revolution). All specimens were thermocycled between 5℃ and 55℃, immersed 2% methylene blue dye for 24 hours and then rinsed with tab water. The specimens were embedded in clear resin and sectioned longitudinally with a low speed diamond saw. Dye penetration at gingival margin was viewed at ×20 magnification and analyzed on a scale of 0 to 4. Kruscal-Wallis One way analysis and Mann-Whitney Rank sum test were used to analyze the results. Results: The leakage values seen at the enamel margin were significantly lower than those seen at the dentin margin($P<0.05$). No groups in this study showed significant differences in leakage values at both the enamel and the dentin margins($P>0.05$). Conclusion: The use of flowable composite resins as liners in class II packable composite resin restorations did not reduce microleakage at the gingival margins.

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Microtensile bonding of dentin adhesives

Yong-Beom Song, Se-Joon Lee, Kwang-Won Lee.

Department of Conservative Dentistry & Institute for Oral Bioscience, College of Dentistry, Chonbuk National University

The purpose of this study was to evaluate the microtensile bond strength of sixth-generation adhesives according to various dentin surface treatments and to observe the interface between resin(Z-100TM) and dentin by SEM.

This study employed forty-five non-caries extracted human molars and three adhesive systems were used ; All-Bond 2(AB), One-Up Bond F(OU), AQ-Bond(AQ). ; group 1, 2, 3 were used AB and were respectively treated by smearing(S), ultrasonic cleansing(US), etching(E). group 4, 5, 6 were used One-Up Bond F and were also respectively treated by S, UC, E. groups 7, 8, 9 were used AQ Bond and were respectively treated by S, UC, E. all groups were prepared for microtensile testing, and were stored for 24hrs in distilled water at 37℃. microtensile bond strength for each group was then measured. to examine the failure patterns of resin to dentin, specimens were fabricated and observed under the SEM.

The results were as follows;

1. The microtensile test results (mean±SD) were group1, 25.69±4.31MPa; group2, 40.93±10.94MPa; group3, 47.65±8.85MPa; group4, 36.98±9.14MPa; group5, 39.66±8.45MPa; group6, 43.26±13.01MPa; group7, 25.07±4.2MPa; group8, 30.4±4.74MPa; group9, 33.61±7.88MPa
2. One-Up Bond F was showed the highest value of 36.98±9.14MPa in dentin surface treatment with smearing, and there were significant differences to the other groups.($p<0.05$)
3. All-Bond 2 was showed the highest value of 40.93±10.94MPa in dentin surface treatment with ultrasonic cleansing, but was no significant difference to One-Up Bond F.($p>0.05$)
4. All-Bond 2 was showed the highest value of 47.65±8.85MPa in dentin surface treatment with etching(10%phosphoric acid), and there were significant differences to the other groups.($p<0.05$)
5. All-Bond 2 was showed the highest value of 47.65±8.85MPa in dentin surface treatment according to manufacture's directions, but was no significant difference to One-Up Bond F.($p>0.05$)
6. AQ Bond was showed the lowest microtensile bond strength with various dentin surface treatment, and the were significant