ABSTRACT

Objective: The objective of this *in vitro* investigation was to evaluate the effect of adhesive resin coating with a self-etch dentin bonding agent and etch and rinse dentin bonding agent and without coating on microleakage of class II indirect composite inlay cemented with self-adhesive resin cement on enamel and dentin interfaces after thermocycling.

Methods: Thirty-six upper permanent premolars extracted for orthodontic needs were selected for this study and randomly allocated to three experimental groups (n=12). These samples of teeth were prepared in a standardized manner under jig assembled on a milling machine. After preparation, group I: no surface treated with dentin bonding agent; group II: prepared surface treated with a self-etch dentin bonding agent and group III: prepared surface treated with etch and rinse dentin bonding agent. And then, impression taking with rubber base impression materials and indirect composite inlays were fabricated and cemented with self-adhesive resin cement.

Restored teeth were artificially aged with a thermocycling machine (5±2^{o}C and 55±2^{o}C, 1000 cycles with 30 sec dwell time). After thermocycling, the samples were immersed in 2% methylene blue dye solution for 24 hours. Then, teeth samples were sectioned mesiodistally with Isomet linear precision saw. The most linear penetration of the dye was observed under a stereomicroscope at 40x magnification. All the samples were scored and statistically analyzed with Kruskal-Wallis nonparametric test ($p<0.05$) followed by Mann-Whitney U-test for multiple comparisons.

Results: In group I, no treatment of the prepared surface with dentin bonding agent immediately after preparation and before impression taking (Control group), the mean score was 3.17. In group II, prepared surface coated with self-etch dentin bonding agent immediately after preparation and before impression taking, the mean score was 2.17. In group III, prepared surface

coated with total-etch dentin bonding agent immediately after preparation and before impression taking, the mean score was 2.67. According to statistical analysis, there was a significant difference ($p<0.05$) between all groups in microleakage values by using Kruskal-Wallis non-parametric test. And there is no significant difference between Group I Vs III and Group II Vs III.

Conclusion: 1. Microleakage of class II composite inlay cemented with self-adhesive resin cement significantly decreased by using adhesive resin coating with a self-etch dentin bonding agent on the prepared surface before impression taking.

2. There is highly significantly lower leakage at the occlusal margin versus the dentin margin of all tested groups in inter-group comparison.

Keywords: self-etch adhesive, etch and rinse adhesive, self-adhesive resin cement, Thermocycling machine, Isomet linear precision saw, 2% methylene blue, Microleakage.