ABSTRACT

Objective: The objective of this study was to compare the microleakage of cast Nickel-Chrome crown luted with conventional glassionomer cement and resin modified glassionomer cement among surface untreated (control), Polyacrylic acid surface treated, and self- etch adhesive coated teeth.

Methods: Sixty upper permanent premolars extracted for orthodontic needs were selected for this study. These teeth were prepared with a standardized manner to receive full metal copings. Preparation of the teeth sample was done with jig assembly on milling machine. After preparation, the teeth sample was grouped into six groups: no surface treated and luted with GIC (Group IA), no surface treatment and luted with RMGIC (Group IB), surface treatment with polyacrylic acid and luted with GIC, (Group IIA), surface treatment with polyacrylic acid and luted with RMGIC, (Group IIB), tooth surface coated with self-adhesive resin and luted with GIC, (Group IIIA), and tooth surface coated with self-adhesive resin and luted with RMGIC (Group IIIB). Group IA and IIA are controlled groups.

Then, these samples were artificially aged with thermocycling machine at temperature of 5°C ± 2°C - 55°C ± 2°C and 60 seconds immersion time. After thermocycling, the samples were immersed in 2% methylene blue solution for 24 hours. Then, the crowns of the teeth samples were longitudinally sectioned along buccolingual direction with Isomet linear precision saw. The most linear penetration of dye was observed under stereo microscope.

Results: No surface treatment and luted with GIC and RMGIC have mean score of 24.5 and 22.9, polyacrylic acid surface treatment luted with GIC and luted with RMGIC have mean score of 33.85 and 29.55, and self-etch adhesive resin coating and luted with GIC, and luted with RMGIC have mean score of 47.55 and 25.1 respectively. According to statistically analysis using by Kruskal-Wallis Test, at a significant level of P=0.05, significant differences were found among three different tooth surface treatment groups (P=0.01). There was also statistically significant result between GIC and RMGIC luted to self-etch adhesive resin coated tooth (P=0.009). There was no statistically significant difference between control and polyacrylic acid surface treatment.

Conclusion: Surface coating with self-etch adhesive resin after tooth preparation have greater microleakage when luted with GIC.

Keywords: Microleakage of Nickel-Chrome crown, glass ionomer luting cement, resin modified glass ionomer cement, self-etch adhesive resin, 2% methylene blue dye penetration