Comparison of microleakage between resin modified glass ionomer and self-adhesive flowable resin composite restorations

Abstract Introduction: Numerous studies have been performed to evaluate microleakage and compare different restorative materials to reduce it, but little is known about the effect of salivary contamination on the amount of microleakage in restorative materials. Therefore, the aim of this study is to compare the microleakage of resin modified glass ionomer and self-adhesive flowable resin composite with and without salivary contamination.

Methods: For this study, 56 permanent premolars andt molars were selected. Class V cavities were prepared so that the occlusal margin was at the enamel and the gingival margin was at the cementum. The prepared teeth were randomly divided into the following groups: (1) placement of the self-adhesive flowable resin composite in the prepared cavity; (2) salivary contamination of the cavity + placement of self-adhesive flowable resin composite in the prepared cavity; (3) placement of resin modified glass ionomer ; (4) salivary contamination of the cavity + placement of resin modified glass ionomer in the prepared cavity; (5) positive control group; (6) Negative control group. The cavities prepared in groups 2 and 4 were contaminated with natural saliva before the restorative material was applied. The saliva was applied to the cavities with a cotton swab saturated with saliva for 5 seconds and then dried. The prepared teeth were thermocycled between 5-55 ℃ for 1000 cycles. Staining was performed by immersing the prepared teeth in 2% methylene blue solution for 48 hours. In the next step, the prepared teeth were sectioned bucklingoally from the restoration center and the amount of microleakage was measured under a stereomicroscope and the results were analyzed using SPSS software.

Results: In the case of no salivary contamination, the amount of microleakage in the gingival wall of resin modified glass ionomer significantly higher than the self-adhesive flowable resin composite ($P = 0.045$) and the amount of microleakage in the occlusal wall of the self-adhesive flowable resin composite significantly higher than the resin modified glass ionomer ($P = 0.034$). In resin modified glass ionomer, the amount of microleakage in both gingival and occlusal walls in salivary contamination was higher than in uninfected condition but this difference was not statistically significant ($P> 0.05$). In self-adhesive flowable resin composite, the amount of microleakage in both gingival and occlusal walls in the salivary contamination state was higher than the non-contaminated state, which was

statistically significant in the gingival wall (P <0.001) but not significant in the occlusal wall. (P> 0.05).

Conclusion: The results of the present study showed that: (1) in the case of salivary contamination, resin modified glass ionomer had significantly less microleakage in the occlusal wall and self-adhesive flowable resin composite had significantly less microleakage in the gingival wall. (2) Salivary contamination did not have a significant effect on microleakage in any of the occlusal or gingival walls of the resin modified glass ionomer, but significantly increased the microleakage in the gingival wall of the self-adhesive flowable resinc omposite.

Key words: Microleakage, resin modified Glass ionomer , Self-adhesive flowable resin composite , Salivary contamination