Abstract

Title: A comparison between the microleakage of Self-Adhesive Flowable Resin Composite and Resin Modified Glass Ionomer as coronal barriers in non-vital bleaching

Background and Aim:
Endodontic treatment is considered an etiologic factor in iatrogenic discoloration of teeth. The Walking Bleaching technique of non-vital tooth is a simple, reliable method for both patient and dentist. Evidence shows the pH of the root surface decreases following the application of bleaching paste which causes an enhance in the osteoclastic activity. Thus, usage of a protective barrier on top of root canal filling is recommended to prevent the microleakage of bleaching agents.
A new formulation of flowable composite has recently been introduced which is self-adhesive. Since no study up to this date, has observed the effect of self-adhesive flowable composite coronal barrier on prevention of microleakage in the walking bleaching technique, this study has been conducted.

Materials and Methods:
34 single-rooted, newly extracted Maxillary teeth which were from patients aged 45-65 with periodontal issues were selected for this study. Teeth were checked for any anomalies or severe caries and undergone root canal treatment and 2mm of canal filling material was removed for coronal barrier placement before the bleaching process. Next, they were divided into two experimental groups of 12 and positive and negative controls of 5. In one experimental group, Resin Modified Glass Ionomer (GC FUJI II) and in another, a layer of self-adhesive flowable composite (Kerr Vertise Flow) and on top of that, Microhybrid composite (Kerr point4) were used with the same 2mm thickness. In the negative control group, sticky wax was used to reach a complete coronal seal and in the positive control group, no barrier was placed on top of the root canal filling.
Following the placement of Cavit on teeth and incubation in 100% humidity and 37°c temperature, the process of walking bleaching with 35% hydrogen peroxide (Ultradent Opalescence Endo) was performed with the instructions of the manufacturing company in 3 rounds each with 3-day intervals and at the end, a 2% methylene blue solution was used to indicate the amount of microleakage inside the root canals of all samples. Buccolingual sections of all samples were prepared and observed with a stereomicroscope.

Results:
The mean microleakage in groups of 'Resin Modified Glass Ionomer', 'Self Adhesive Flowable Composite Resin', and 'Negative Control' was significantly lower than the 'Positive Control' group (P=0.001).

Also, The mean microleakage in 'Self Adhesive Flowable Composite Resin' group was lower than 'Resin Modified Glass Ionomer' but this difference was not significant (P=0.56)
The difference of mean microleakage between the 'Self Adhesive Flowable Composite Resin' and 'Negative Control' groups was not significant (P=0.04).
Conclusion:

The comparison of mean microleakage of experimental and negative control groups with the positive control group shows the placement of a coronal barrier has a noteworthy effect on reducing the amount of microleakage into the root canals in walking bleaching technique.

The insignificance in mean microleakage difference between the 'Self Adhesive Flowable Composite Resin' and 'Negative Control' groups shows the efficiency of Self Adhesive Flowable Composite Resin as a coronal barrier in walking bleaching technique.

The comparison of the mean microleakage between the experimental groups shows no significant difference and it can be concluded that both Self Adhesive Flowable Composite Resin and Resin Modified Glass Ionomer are suitable coronal barrier materials for walking bleaching.

Keywords: Microleakage, Self Adhesive Flowable Composite, Resin Modified Glass Ionomer