

Abstract

Comparison of apical sealing in root-treated teeth with gutta-percha and AH plus, AH26, Sure seal root and Endoseal MTA sealers by the single cone method

Introduction: The success of root canal treatment depends on the effective destruction of microorganisms creating a complete flood along the entire length of the root canal system from the coronal entrance to the apical end. In order to create a suitable flood in addition to the main materials for the filling the root space quality sealers are needed. However, studies comparing the mentioned sealers based on apical seal are contradictory; therefore, the present study was conducted with the aim of comparing the apical seal of teeth treated with gutta-percha and Sure_seal root, AH Plus, AH26 and Endoseal MTA sealers.

Materials and methods: In this experimental study, in vitro, 60 single-root and single-channel mandibular premolar teeth were collected. The preparation of the canals was done using the Protaper rotary system (Dentsply Maillefe) up to the F2 file and at a speed of 250 rpm. Four teeth were randomly selected as the control group and the rest of the samples will be randomly divided into four groups of 14. And they were sealed with the above-mentioned sealers by the single cone method. The positive and negative control groups were filled with gutta-percha and without sealer by the single cone method. The samples were cut by a diamond disc along the grooves and divided into buccal and lingual halves. The linear leakage of methylene blue from the apex of the root to the most coronal part where the dye penetrated was observed and recorded using a stereomicroscope, and the data was analyzed using one-way analysis of variance between groups using SPSS version 26 software. A significance level of less than 0.05 was considered.

Results: The results of the investigation showed that the lowest amount of apical microleakage in the examined sealers was related to AH plus sealer (4.811 ± 0.661), Endoseal MTA equal sealer (5.091 ± 1.166), AH26 sealer equal (5.923 ± 1.898) and finally Sure seal root was equal to (6.192 ± 1.732). The apical seal in AH plus sealer was more and significant than Sure seal root and AH26 sealers ($P < 0.05$), but although the apical seal in AH plus sealer was more than Endoseal MTA sealer, it was not significant ($P < 0.05$). and apical seal in Endoseal MTA sealer was more and significant than Sure seal root sealer ($P < 0.05$).

Conclusion: Apical seal in teeth treated with gutta-percha and AH Plus sealer showed the best results compared to Sure_seal root, AH26 and Endoseal MTA sealers.

Keywords: AH26 sealer, Endoseal MTA sealer, AH plus sealer, sure-seal root sealer, apical seal, gutta-percha, single cone.