

Evaluation of the Apical Sealing Ability and Marginal Adaptation of Bone Cement and Mineral Trioxide Aggregate as Root-end Filling Materials(A Comparative in Vitro-Study)

Abstract

Introduction: The aim of this study is to evaluate the apical sealing ability of bone cement and MTA using dye penetration method and to assess their marginal adaptation using scanning electron microscopy (SEM).

Method: Sixty maxillary anterior teeth were used in this study. The crowns were decapitated and the root canals were biomechanically prepared then obturated with gutta percha and resin sealer. The apical 3mm of each root was resected. Root-end cavities were prepared and filled with either MTA or bone cement. Samples were divided into two main groups. Group I: Microleakage was assessed by immersing the samples in silver nitrate solution followed by reducing it to precipitate the silver ions. Linear dye penetration was measured under SEM using EDX system. Group II: Marginal gaps between root end filling materials and dentinal walls were observed under SEM. Data was collected and statistically analyzed using Kruskal-Wallis test and Mann-Whitney U test.

Results showed that there was no statistically significant difference in sealing ability between the two materials. All samples showed some degree of microleakage. Marginal gaps existed between both materials and dentinal walls. *Conclusions:* bone cement might be considered as a promising material for use as a root-end filling.

Keywords: MTA, Bone cement, Sealing ability, Marginal adaptation, EDX.