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The comparative study of application three different materials (calcium hydroxide, Mineral trioxide aggregate,and Biodentine)as pulpotomy agent in rabbit teeth(Histological and microleakage measurement)

Thesis Submitted To The Council Of College Of Dentistry, Baghdad University, In Partial Fulfillment Of Requirements For The Degree Of M.Sc.In Pediatric Dentistry

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Abstract

Background . Pulpotomy procedure considered important and common procedure in pedodontic field and there are several materials used as pulpotomy agent. This study compare between Calcium hydroxide, and Mineral trioxide aggregate and Biodentine. Calcium hydroxide is a material which has been used for a variety of purposes since its introduction into dentistry in the early years of the twentieth century. Mineral trioxide aggregate has been recommended for pulp capping, pulpotomy, apical barrier formation in teeth with open apexes, repair of root perforations, and root canal filling. Biodentine is a new bioactive cement. It has dentin-like mechanical properties, which may be considered a suitable material for clinical indications of dentin-pulp complex regeneration such as direct pulp capping and pulpotomy.

Aim of study: The aim of this study is to evaluate the histological response of the pulp tissue and morphology and thickness of dentine bridge to different materials (calcium hydroxide, MTA and Boidentine) after pulpotomy procedure and measurement of microleakage of these materials.

Material and method: One hundred and two sound incisors of rabbit teeth that selected for the experiment (pulpotomy procedure, morphology and thickness of dentine bridge and microleakage measurement) for three different materials (Calcium hydroxide, Mineral trioxide aggregate and Biodentine™). The teeth should be free from carious lesion, morphological defects. The (72) of animal teeth selected to evaluate the histological response of the pulp tissue to these different materials after pulpotomy procedure. While the other (30) of animal teeth were selected to measure the microleakage of these different materials. Then the samples are processed in the laboratory and then sectioned and viewed by

microscope. Histological study include three interval periods (1, 7, and 14 days) after pulpotomy procedure and then H and E staining and viewed under light microscope. In microleakage study there are two interval periods (1 and 14 days) after application of materials and then using ground section by struers Minitom devise and observed under streomicroscope.

Result: The results of this study appear that all the materials cause inflammation after application to the pulp tissue, but Calcium hydroxide cause inflammation higher than Mineral trioxide aggregate and Biodentine in all interval periods, while there was no significant differences between Mineral trioxide aggregate and Biodentine in all interval periods. Microleakage study the results appear that Calcium hydroxide cause microleakage higher than Mineral trioxide aggregate and Biodentine in two interval, while there is no significant differences between Mineral trioxide aggregate and Biodentine.

Conclusion: From this study, appear that Biodentine and Mineral trioxide aggregate give better result than Calcium hydroxide when used in pulpotomy procedure and microleakage.