

Using mineral trioxide aggregate and calcium hydroxide as a pulp-capping materials

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INTRODUCTION: Pulp capping is defined as the placement of a dental material over an exposed pulp to initiate the formation of irritation dentin at the site of injury. Classically, different formulations of calcium hydroxide (CH) have been used. Today, a newer material is advocated for vital pulp therapy, mineral trioxide aggregate (MTA). We proved that the exposed dental pulp has the capacity to heal when microleakage and bacterial contamination are prevented. Therefore, it appears that an effective pulp-capping material should be biocompatible, that it should provide a biological seal and prevent bacterial leakage.

METHODS: In this experiment we used 10 premolars upper and lower. We isolated the teeth with a rubber dam and, using a round bur in a high-speed handpiece with a copious water spray, we created standardized pulp exposures (1 millimeter in diameter) by a vestibular access opening. We controlled bleeding with sterile cotton pellets before placing the pulp-capping materials. The materials used were either a calcium hydroxide preparation or MTA. Eventually, we surgically removed the teeth and perfused them with formalin. The specimens were processed for histological examination. The sections were stained with hematoxylin and eosin.

RESULTS: The pulps capped with MTA or calcium hydroxide showed dentin bridge formation or dentin chips present. Dentin chips may promote or retard healing. A dentin bridge has formed a complete barrier at the exposure site and the pulp is free of inflammations. The reparative dentin did not originate from severely damaged odontoblasts; instead, undifferentiated cells that migrated from

deep regions of the pulp replaced the degenerated odontoblasts. This explains why the reparative dentin is regular when is formed from areas where the odontoblasts remain intact.

DISCUSSION & CONCLUSIONS: Based on the results of this study and the properties of materials we demonstrated that MTA and calcium hydroxide are suitable as pulp-capping materials during vital pulp therapy. The pulp-capping procedures used here resulted in the pulp being mechanically exposed. In future work pulp reaction to MTA and CH in carious pulp exposures should be tested.

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