

MTA DIRECT PULP CAPPING - A CASE REPORT

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ABSTRACT

Significant clinical challenge is presented to an endodontist when there is carious exposure of irreversibly inflamed vital pulp in a young permanent tooth to maintain vitality. Vital pulp therapy like direct pulp capping, partial pulpotomy and complete pulpotomy are some of the treatment options available. Though calcium hydroxide has been the gold standards for direct pulpcapping, MTA has shown promising results in the recent studies. The present case report describes the successful apexogenesis of mandibular left second permanent molar using Mineral Trioxide Aggregate (MTA) and also discussed prognostic and technique guidance.

Keywords: MTA, Apexogenesis, carious exposure, complete pulpotomy, young permanent tooth.

INTRODUCTION

Apexogenesis is a vital pulp therapy procedure done to aim at continuous root formation along with physiological development.(1) The aim of pulp treatment is to preserve pulp vitality as much as possible. Various vital pulp therapy include indirect, direct pulp capping and pulpotomies out of which Direct pulp capping is considered to be less invasive.(2) It will aim at treating reversible pulpitis of immature permanent teeth and thereby preventing the need of root canal treatment.(3) exposure of dental pulp to microorganism leads to pulpal and periapical inflammation.

(4) and in case of immature teeth it will determine the root formation and development. If the pulp is inflamed irreversibly or necrosed then the treatment becomes unpredictable.(5). Various material has been used before for capping the pulp such as calcium hydroxide Ca(OH)₂, zinc oxide eugenol(ZOE), corticosteroids, antibiotics, polycarboxylate cement and bioactive materials like MTA (2). Ca(OH)₂ is considered gold standards but with the invention of Mineral Trioxide Aggregate (MTA) by torabinejad, it has been more widely used in clinical practice.

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(6) MTA is bioactive and biocompatible. In a systematic review and meta analysis conducted, it was shown the MTA has higher success rate, reduced pulpal inflammation and more predictable hard dentinal bridges than calcium hydroxide justifying its common usage. (7) This is a case report of direct pulp capping of a submerged mandibular second molar with MTA.

CASE REPORT

A 12 year old female patient reported to the operatory with the chief complain of pain in right lower back tooth region for the past 2 weeks. Pain was sharp in nature and present on consumption of cold beverages and pain subsided immediately when the consumption is terminated. There was no contributing medical or past dental history. Extra oral examination showed no signs of swelling or facial asymmetry. Intra oral examination revealed the presence of lower left 2nd molar with partial flap covering the distal portion of the tooth. On probing the tooth with a explorer a catch was found in the 2nd molar which was partially covered with the flap. Orthopantomograph (OPG) was advised following the intraoral examination. OPG revealed radiolucency involving enamel, dentin and approaching pulp with incomplete root formation in relation to 37. Diagnosis of acute reversible pulpitis in relation to 37 was given.

Treatment planned was operculectomy in relation to 37 to expose the caries completely followed by direct pulp capping with MTA to allow for the root development and formation to complete. Lignocaine with adrenaline (1:80000) was administered and operculectomy was done with 15 size BP blade. Hemostasis was achieved followed by excavation of caries with small round bur and spoon excavator (*HuFriedy*). All the affected dentin was removed with lead to pin point pulp exposure of the mesial pulp horn. Hemostasis was achieved in less than 5 minutes with the usage of 3% sodium hypochlorite. MTA was place at the site of exposure and the tooth was temporized. Patient was recalled after 2 days to check for the setting of MTA which was satisfactory. This was followed by the placement of bonded restoration. Post operative photograph and OPG was taken after 3 months. OPG showed progression of root formation in relation to 37. Patient is kept under constant follow up until root apex closure occurs.

PRE OPERATIVE OPG



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POST OPERATIVE OPG



POST OPERATIVE CLINICAL PICTURE



DISCUSSION

Various studies have demonstrated varying success rates when comparing calcium hydroxide and MTA for direct pulp capping procedure. 93% of the cases with cariously exposed young permanent permanent molar showed vitality in a two year follow up study of direct pulp capping procedure with MTA.(8). A long term four year prospective study on Direct pulp capping with MTA in 49 immature and mature cariously exposed teeth with reversible pulpitis demonstrated a 100% and 98% success respectively.(9)

The biological properties of MTA, includes biocompatibility, Sealing ability and hard tissue induction potential. This is mostly attributed to reaction between calcium ion in MTA and phosphorous ions in the surrounding tissue. This leads to the formation of hydroxyapatite crystals.(10) These properties are the reason for favorable outcome in the cases and causes hydroxyapatite crystals formation.

The coronal pulp is saved in DPC and the clinicians could perform pulp vitality tests in addition to periapical and radiographic examination and then compare it with baseline data and come to a conclusion on the pulpal status of the tooth. DPC is also much simpler, less expensive and more conservative compared to root canal therapy and pulpotomy.(11)

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