

APEXIFICATION USING MINERAL TRIOXIDE AGGREGATE CASE REPORT

ABSTRACT

It is difficult to treat immature teeth with necrotic pulp and periapical lesion through conventional endodontic treatment.

Use of calcium silicate material in dentistry became popularised due to various chemical application and its inherent advantage namely biocompatibility, sealing ability, regenerative capacity and antibacterial characteristics.

Previously calcium hydroxide was used for apexification but due to its drawbacks modified calcium silicate was introduced to overcome these difficulties.

Keywords: Apexification, calcium silicate mineral trioxide aggregate.

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Introduction

One of the reasons for open apex in developing teeth is trauma and in such cases obturation is difficult. For a successful root canal treatment an apical barrier should be created. The material used previously for hard tissue formation was calcium hydroxide, but it used to take around 6-18 months to do so¹. Other than the delay in hard tissue formation, its long-term use weakens the dentin and lead to tooth fracture.²

Inorder to overcome the drawbacks of calcium hydroxide a new material named MTA - Mineral Trioxide Aggregate was invented by Torabinejad in the year 1993.³ Studies have indicated that the thickness of hard tissue formation for MTA is more than Calcium hydroxide.⁴

This is the reason why we have used MTA for apexification in the following case.

Case Report

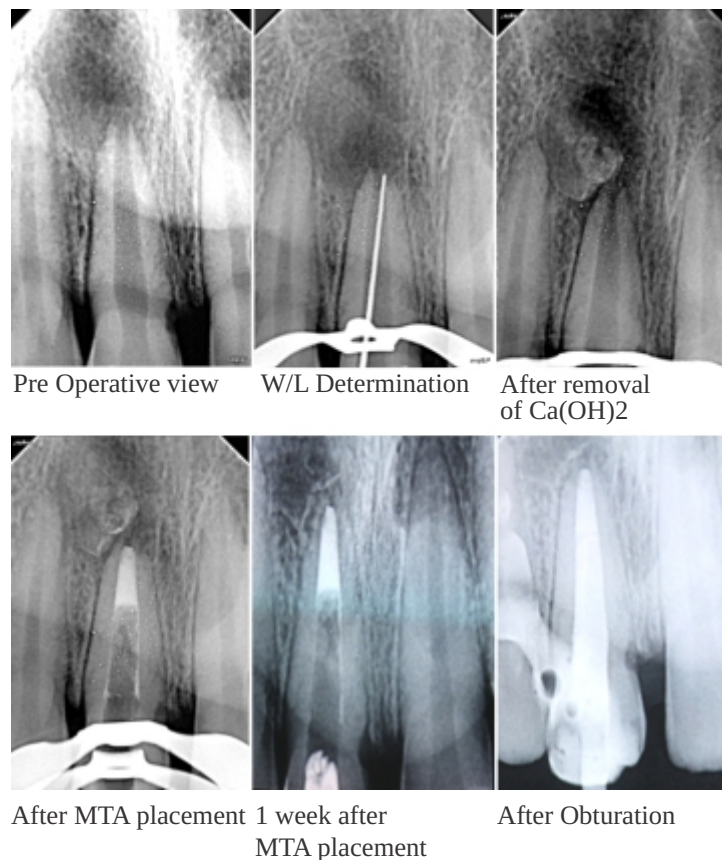
A 10 year old boy came to the clinic complaining of pain in the upper front teeth. On taking previous history we understood that the patient met with an accident 2 years back.

On clinical examination Ellis class III fracture on 11was found. The tooth was tender on percussion. Intraoral radiograph showed incomplete root end formation of 11. On pulp testing there was no response from the patient which indicated that the concerned tooth was non-vital.

The patient was explained the treatment plan in detail and consent was obtained. The treatment was commenced. Access opening was done, working length was determined, cleaning and shaping was done, canal irrigated with 5.25% sodium hypochlorite and normal saline. Calcium hydroxide dressing was given for 2 weeks and temporary resto-

ration was given. The patient was recalled after 2 weeks for review.

After 2 weeks, on examination the tooth was asymptomatic and then the temporary restoration was removed, canal was irrigated and dried with paper point. Suitable plugger was selected and MTA was mixed with distilled water to a required consistency and placed in increments in the apical region of the canal using micro apical placement system and compacted with plugger. IOPA was taken for confirming that there was 5mm of MTA left in the canal. Moist cotton was placed for the material to set and cavity was temporized. The patient was recalled after 24 hours for obturation.



Discussion

Open apex is one of the many challenges to the endodontist due to the absence of apical barrier. In order to overcome this difficulty the first aim is to induce apical closure. Apexogenesis and apexification are the two treatment options for open apex cases. Apexogenesis is the treatment for main-

taining the vitality in apical part of the root canal for the formation of root apex⁵.

Apexogenesis was not possible in our case due to complete necrosis of the pulp. That's the reason we used apexification to obtain apical closure. Calcium hydroxide which was previously used for apexification had pH of 12.5 which was highly alkaline caused changes in the mechanical behaviour of dentin which led to root fracture.^{2,6}

Torabinejad introduced MTA as the material of choice for apexification and its constituents are calcium silicate, bismuth oxide, calcium carbonate, calcium aluminate, calcium sulphate. Advantages of MTA are hard tissue formation and bio compatibility. Mechanism of action MTA are it has the ability to produce cementoblast cells which induces hard tissue formation and thereby preventing the entry of microorganisms.^{7,8,9,10}

CONCLUSION

The apical barrier formation by using MTA enhances the root strength and decreases the fracture rate of the teeth. In addition to this it reduces the number of visits to the clinician.

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