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CASE REPORT

NON-SURGICAL MANAGEMENT OF PERIAPICAL LESIONS

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ABSTRACT
Apexification aims to induce apical closure of the open root apex with a hard-tissue barrier, against which a root filling can be compacted. Despite the popularity of the apexification procedure, calcium hydroxide therapy has some disadvantages which mainly includes variability of treatment time, unpredictability of apical closure, difficulties with patient follow-up and delayed treatment. Mineral trioxide aggregate (MTA) is a potential apical barrier material with goodsealability and a high degree of biocompatibility. The present case report demonstrates the placement of an apical barrier using MTA along with conventional root canal treatment.
Keywords: Apexification, apical barrier, sealability, biocompatibility.

INTRODUCTION

Traumatic injuries sustained before closure of the apex often results in immature pulpless teeth. In such situations, the absence of a natural constriction at the end of the root canal makes control of filling materials difficult.[1]Failure resulting from apical leakage is also common due to difficulties in sealing open-apex teeth Frequently, the extrusion of the root filling materials into the periapical tissues is observed.

Among the possible treatments to perform in a permanent tooth with short roots that needendodontic therapy, we have the apexification that is a procedure of induction of a calcifiedapical barrier in the apical zone of an incompletely formed root, in which the pulp is diagnosedas necrotic.[2]Calcium hydroxide (CH) has been the material of choice for apexification.[3] Calcific barrier formation is induced with repeated changes of material over the course of 5–20 months averaging 12.9 months.[4,14] Some disadvantages of this technique have been reported. The lack of coronoradicular restoration and thus of an appropriate coronal seal makes the tooth susceptible to reinfection.[5,15]

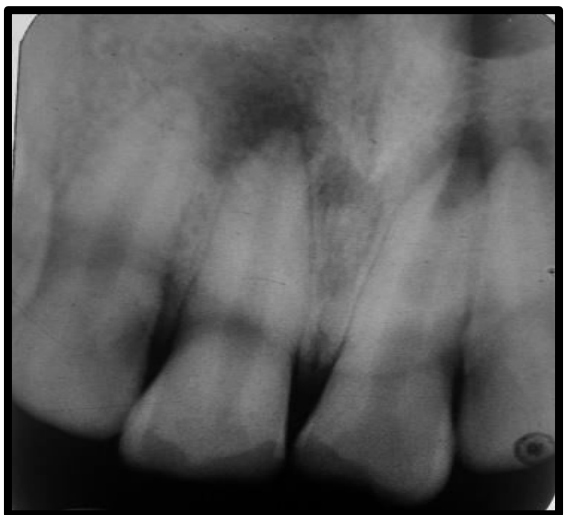
Mineral trioxide aggregate (MTA) is a FDA approved, commercially available material that has evoked considerable interest as a root end filling material. The granular consistency of the mix with sterile water makes the orthograde placement of the material in the apical region of canal technique sensitive.The MTA can be placed as an apical plug with previous

applications intracanal with Ca(OH) to produce the disinfection of the same or even the MTA can be used as a material of canal filling.[6,16]

CASE REPORT

A 11 year old female patient reported to the Department of Conservative Dentistry and Endodontics of the Desh Bhagat Dental College & Hospital, Mandi Gobindgarh with history of traumatic injuries to maxillary central incisors that occurred approximately 18 months back. The teeth were diagnosed to be non vital with a combination of clinical signs and symptoms, vitality tests and radiographs.

PRE-OPERATIVERADIOGRAPH OF 11 & 21



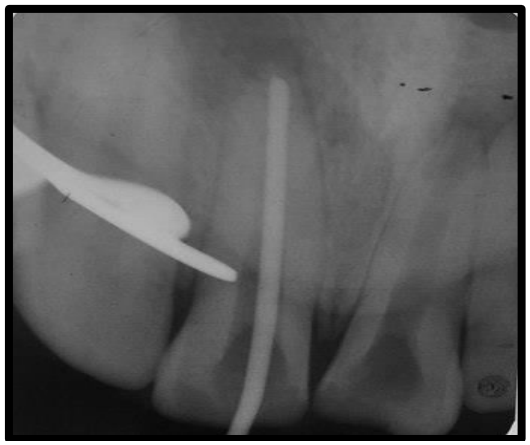
Clinical examination revealed that the incisal edges of teeth 11 and 21 had been fractured. Both maxillary central incisors were tender to percussion and palpation. No abnormal periodontal probing depths or pathologic tooth mobility were detected.

The teeth were isolated with rubber dam after achieving local anesthesia. Access cavity was prepared in the palatal surface of the incisors. The cavities were widened with GG drills to enhance the visibility of the root canal. The canal was then gently cleaned with manual instruments with 5% sodium hypochlorite irrigation followed by saline. The working length was measured radiographically and recorded for reference.

WORKING LENGTH RADIOGRAPH OF 11 & 21

Firstly, the tooth no. 11 was treated with conventional root canal treatment as it had completely closed apex. After the preparation of root canal of tooth no. 11, a master cone X-ray was taken.

MASTERCONE RADIOGRAPH OF 11



The same tooth was then obturated using gutta percha and in the same sitting, the tooth no. 21 which had an open apex was packed with MTA into the apical part of canal to create a 3-4 mm thick artificial apical barrier. Moist cotton pellets were then inserted into the canal to directly contact the MTA to enhance setting The access cavity was then sealed with Cavit.

MTA PLUG OF 21

The following day, after removing the cotton pellets the canal was cleaned, dried and obturated with gutta-percha and Zinc oxide eugenol as sealer. The tooth was was restored with Type-II GIC.

OBTURATION OF 11 & 21

At three-month recall both upper central incisors were clinically normal A radiograph revealed a small amount of calcified tissue at the apex of tooth 21. No apparent pathological change of the periapical tissues was observed radiographically.

RADIOGRAPH OF 11 & 21 AFTER 3 MONTHS

DISCUSSION

MTA has been reported to have several desirable properties such as biocompatibility, fibroblast stimulation, antimicrobial activity and sealing capacity with an ability to set in a moist environment.[7,17] Application of MTA results in predictable apical closure and reduction of the treatment time, number of appointments and radiographs, particularly in young patients.[8,19] Orthograde obturation with mineral trioxide aggregate as an apexification material also represents an attempt to strengthen immature tooth roots.[9,20]

Apexification with MTA several clinical studies[10.11,21,22] report that MTA provides a vi-able alternative to achieve root closure in immature teeth or root fracture, even in cases withan open apex. The time required for the formation of the barrier is significantly less in teethtreated with MTA compared to teeth treated with Ca(OH).

Chan et al.[12,23] studied whether MTA favorsapexification and periapical scarring even when a considerable amount of this material has been inadvertently extruded. Although it is recognized that the extrusion of MTA through an open apex is not a common mishap during the apexification procedure, the extruded material does not adversely affect the healing of the pe-riapical tissues, as verified in the present study with clinical observations and X-rays with a follow-up of cases of 36–54 months; Nosrat et al.[13]analyzed whether after the extrusion ofMTA in periradicular tissues, bone healing, and reabsorption of MTA may occur or may remainunactivated, and affect the healing process.

In the present case report the MTA which was used as an orthograde filling material produced a sufficient barrier against which gutta percha could be condensed. Using MTA for apexification may shorten the treatment period and improve patient compliance.

CONCLUSION

The MTA barrier as a treatment of apexification is a technique that is applied as a substitution to Ca(OH) apexification; this technique does not require several appointments, and the con-formation of the barrier does not need an external factor to develop, as in the case of the apexification with Ca(OH).

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