

CASE REPORT

Esthetic Management of Fractured Anterior Tooth with Incomplete Apex using MTA Plug and Fiber Post System – A Case Report

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ABSTRACT

Introduction: Extremely complex challenges are presented when traumatic injuries occur in permanent teeth in children. Immediate intervention with long term restorations is not possible in such cases because of growth and developmental influences, periodontal sequelae and unknown endodontic challenges. Management of non-vital teeth with open apices is a challenge to dental practitioners as it is difficult to maintain the obturation material within the confines of root canal without encroaching into periapical area. Also, thin dentinal walls of canal is a matter of concern. Thus closure of root apex is very essential for success of the endodontic treatment. Furthermore, most endodontically treated teeth require intraradicular devices for restoring teeth to optimum health and function. The fiber post system flexes under lateral loading and prevents undue stress.

Case report: This case report discusses the treatment of a 9 year old boy with Ellis Class IV fracture wrt. 21 and Ellis Class II fracture wrt 11.

Conclusion: Apical barrier was created with MTA in open apex followed by root canal therapy in 21 and an esthetic interim coronal restoration was done using a fiber post system and composite material.

Keywords : Ellis Class IV Fracture, Fiber post system, MTA Apexification, Immature apex, Composite Restoration

How to cite this article: Deepika Kapoor, Deepanshu Garg, Neeraj Mahajan, Jasvir Kaur. Esthetic management of fractured anterior tooth with incomplete apex using mta plug and fiber post system – a case report. International Journal of Contemporary Medical Research 2015;(3):764-766

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Source of Support: Nil

Conflict of Interest: None

INTRODUCTION

Dental trauma in young permanent tooth may lead to nonvitality, if not intervened at an early stage.^{1,2} The treatment of non-vital immature teeth is a great challenge to clinician, as the root formation has not completed and open apex is found. Also, thin dentinal walls of canal is a matter of concern.³ MTA, a biocompatible material, can be used to create a physical barrier that also helps in formation of bone and periodontium around its interface. Furthermore, most endodontically treated teeth require intraradicular devices for restoring teeth to optimum health and function. The aim of this case report is to present a case of a 9 yr old boy with Ellis Class IV fracture treated by MTA apexification and restored with composite as an interim restoration after using fiber post system for root strengthening.

CASE REPORT

A 9 year old boy reported to the department with a chief complaint of broken upper front teeth due to fall from stairs one month back. Pain was sharp, sudden and evoked on cold and hot stimuli, lingering in nature. Later, it became spontaneous and was not even relieved on medication when he decided to visit a dentist. Patient also complained of swelling in the same region since 1 day back for which he took medication from a general practitioner. The medical history was unremarkable. The clinical examination revealed the fracture of right and left permanent maxillary central incisors involving enamel and dentin in tooth 11 and involving enamel, dentin as well as pulp in tooth 21. (Figure-1,2) There was no response evoked on electric pulp testing in 21 indicating non – vital tooth. Tooth 21 was tender to palpation and percussion. Intraoral periapical radiographic examination showed that the tooth had immature root with an open apex. The treatment plan was explained and an informed written consent was taken. Access cavity was made in tooth 21 followed by work-

ing length determination. Gentle instrumentation and copious irrigation was done followed by the placement of antibiotic paste. After one week, patient was asymptomatic. MTA (Angelus) powder was mixed with distilled water which was then carried into canal with the help of amalgam carrier and packed to form an apical plug of approximately 4 mm. (Figure-3) Over this moist cotton pellet was placed and access cavity was sealed. One day later, canal was obturated with gutta-percha by lateral condensation technique. On the next appointment, the gutta-percha was partly removed using peeso reamers leaving the apical 5mm of the filling to maintain a good seal. Correct size for the glass fiber post (Reforpost, Angelus) was selected and trial X-ray was taken. Then the prepared cavity was acid etched for 15 seconds with a 37% phosphoric acid gel, rinsed, dried and two coats of a dentin adhesive was applied. The tip of flowable composite tube was placed 2 to 3 mm below the CEJ and the composite was injected. The fiber glass post was inserted into the canal with cotton pliers and light cured. Interim composite restoration was done w.r.t. 21 to meet esthetic requirements for the anterior segment using the incremental technique and occlusal adjustment was performed. Tooth 11 was restored with composite restoration. (Figure-4)

DISCUSSION

Tooth trauma has been and continues to be a common occurrence that every pediatric dentist must be prepared to assess and treat when necessary.⁴ It has no predictable pattern of intensity or extensiveness and has the uncanny knack of accruing at times when the dentists are least prepared. The maxillary central incisors are most often injured in the accidents. An immature permanent incisor tooth is defined as one where the apex can be considered to be open. Root end closure is required in such cases which is a complete calcific barrier at the apex of the tooth against which a gutta-percha filling can be condensed so that the sealant does not pass through the apex into the periapical tissues.

Apexification is a method by which artificial barrier in the root apex is formed in such a way that obturating material can be filled in the canal space. Calcium hydroxide has been extensively used to accomplish apical closure due to its ability to induce hard tissue formation, but it is more time consuming.⁵ MTA has been developed by Torabinejad and co workers in 1990 at Loma Linda University. MTA offers the barrier at the end of the root canal in teeth with necrotic pulps and open apices. MTA has shown good sealing abilities and



Figure-1: Preoperative picture

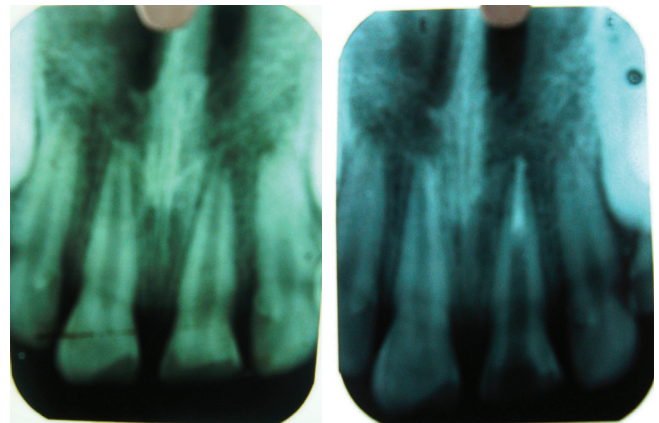


Figure-2: Preoperative radiograph; Figure-3: MTA apification.



Figure-4: Postoperative picture

biocompatibility to the periradicular tissue. MTA has been successfully used as an apical barrier.⁶ Endodontically treated teeth often require a post for their strength. Earlier customized posts machined from metal were used but these can weaken roots and lead to root fracture. Prosthetic failure has been cited as the most common cause of failure in endodontically treated teeth. Currently available fibre-based posts are particularly composite materials. They are formed of fibres of carbon or silica surrounded by a matrix of polymer resin, usually an epoxy resin. Carbon-fibre posts are black in colour and are not aesthetic with all-ceramic units. So, silica-fibre posts which are translucent and more tooth coloured have been introduced.¹⁰

CONCLUSION

Immediate intervention with long term restorations is not possible in such cases because of growth and developmental influences, periodontal sequelae and unknown endodontic challenges. "Interim" restorations are required for the patients normal appearance, function, and health of the dental/alveolar complex until maturation of the patient allows long-term treatment planning.

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