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Case Report

Apexification using MTA - 2 case reports

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Abstract: The closure of root apex occurs upto 3 years after the eruption of the tooth. When tooth gets traumatized and results in necrotic pulpal pathology the formation of root is disrupted which leads to immature open apex. Apexification with MTA is the treatment of choice which induces the calcific barrier at the apex which produce favourable environment for root canal filling.
Keywords: Apexification, MTA, Calcium Hydroxide, Sodium Hypochlorite, Biocompatibility

INTRODUCITON

Traumatic injuries are more common in anterior teeth especially maxillary central incisors where 16% are complicated fractures involving pulp. The prevalence of dental traumatic injuries ranges from 13.8-15.1% [1-3]. When severe, results in inflammation of pulp and later advances to pulpal necrosis. Trauma which occurring in young age affects the root formation and leads to incomplete development of dentinal walls at root apices, which results in Blunderbass canals. Morse *et al.* reported that placing calcium hydroxide in management of incompletely formed roots showed better results, Apexification is the treatment of choice by inducing a calcific barrier at the root apices, which can be done for all ages using MTA, a root canal repair material developed at the beginning of 1990s at Loma Linda University in California. MTA showed better results than multiple visit calcium hydroxides dressing in many recent studies.

CASE REPORT 1

A 19 year old male patient reported to Department of Conservative dentistry and Endodontics with a chief complaint of pain in upper left front tooth region. On clinical examination, there was missing 11 with Ellis class III fracture in 21. EPT showed no response in relation to 21with no grades of mobility. Radiographic examination showed immature open apex. Apexification with MTA was decided as the treatment plan and in the same sitting isolation was done and access was made. Cleaning and shaping was done along with copious irrigation of 5.25% of sodium hypochlorite solution. Calcium Hydroxide was placed for two visits and patient became asymptomatic. MTA was placed at the third visit and obturation was done in the next appointment after three days using lateral compaction technique. Patient was reviewed every 6 months.

Pre-Op

Mta –placement

Mta –with obstruction

CASE REPORT 2

A 17 year old boy reported with a chief complaint of pain in upper right front tooth region. Root canal treatment was initiated in a private clinic. Radiographic examination revealed immature apex with periapical radiolucency. Patient had tender on percussion and there was no response to vitality test using EPT. Access was made under rubber dam and working length was established. Cleaning and shaping was done using hand files till size 80 K files during the same visit. Copious irrigation with saline and 5.25% sodium hypochlorite was used after each instrument. Calcium hydroxide was given as the intracanal medicament. During next visit, MTA was placed at the apex and backfill was done using thermoplasticized technique. Patient was recalled every 6 months for review.

Pre-Op

Mta –placement

Mta –with obstruction

DISCUSSION

Depending on the vitality of the pulp after trauma, the treatment option varies either apex genesis or Apexification. Apexification is a procedure performed to induce a calcific barrier in a root with an open apex. Variety of materials has been used for inducing the apical barrier [4, 6, 7]. Calcium Hydroxide has bactericidal action and has an alkaline PH, stimulates calcification. It has few setbacks like long duration for noticeable results [5].

MTA a biocompatible material has shown superior results compared to calcium hydroxide in recent studies in case of Apexification procedures. The major advantage is that unlike calcium hydroxide MTA doesn't require long treatment duration, and it has less leakage and better antibacterial properties with setting time of 3-4 hours with a Ph of 12.5. MTA acts by producing interleukins and cytokines release which leads to the formation of hard tissue [8, 9].

Complete disinfection of root canal is mandatory before obturation. Root canals with open apices have more communication compared to completely closed apex. So disinfection of canal was done using 5.25% sodium hypochlorite in all three cases and calcium hydroxide dressing was given for periapical healing and eliminating the survived bacterias after cleaning and shaping. Placement of MTA is done and condensed using Endodontic pluggers, Obturation is followed. Kusgoz et al stated that necrotic pulp in teeth with open apices in which MTA as a filling material is effective with shorter treatment time and better sealing ability [12]. The biggest setback is MTA is expensive and its sandy consistency when hydrated [10].

CONCLUSION

It is shown that Apexification using MTA showed promising results in all two cases as a root end filling material.

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