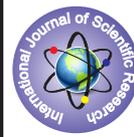


Management of discolored non-vital teeth with an open apex- a case report



Dental Science

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ABSTRACT

Intrinsic discoloration of a non-vital permanent incisor tooth due to trauma may have a significant esthetic and social impact on young adults. The dental practitioner is provided with a variety of treatment options for discoloured teeth which range from invasive methods like full crowns and veneers to least invasive procedures like bleaching. Intervention should be minimal destruction of tooth structure and should not compromise future restorative options. The advantage of bleaching over crown is that it offers simple conservative approach in removal of stain and whitening discolored teeth without damaging tooth structure. Non-vital bleaching restores a smile's natural look where external bleaching methods can't and more expensive alternatives are complicated. This article describes a case report on management of discoloured non-vital maxillary central incisors with an open apex. Mineral trioxide aggregate (MTA) apexification followed by root canal treatment and non-vital bleaching was performed to achieve functional and esthetic rehabilitation.

Introduction:

Trauma to the developing tooth can cause cessation of the root development and the fragile root canals may become weak posing a challenge for cleaning, shaping and obturation during root canal therapy¹. The main aim of apexification is the production of mineralized apical tissue and to form an apical barrier against which the root filling material can be placed, thus avoiding overextrusion². Traditionally, calcium hydroxide was the material of choice for apexification. But apexification with calcium hydroxide is associated with certain difficulties such as the long treatment time required, the possibility of root fracture and the incomplete calcification of the bridge. With the advent of MTA, most of the ideal requirements such as biocompatibility, superior sealing ability and marginal adaptation etc. have almost been fulfilled³.

Trauma to a developing tooth can also cause discoloration, thus comprising the esthetics and can have a social impact on young adults. Treatment options for such discoloration include invasive procedures like veneers and crowns or non-invasive procedures like bleaching. The advantage of bleaching over crowns is that it provides a more conservative approach without removal of the tooth structure⁴. This article presents a case report on the management of discoloured non vital maxillary anterior teeth with an open apex by MTA apexification followed by non-vital bleaching.

Case report:

A 22 year old female patient reported to the department of Conservative dentistry and Endodontics with a chief complaint of discoloured upper anterior teeth since 13-14 years. On clinical examination, teeth were structurally intact and firm. Vitality testing (electric and thermal) showed no response in relation to 11 and 21. An intraoral periapical radiograph showed a blunderbuss canal w.r.t. 21 associated with a periapical lesion. An Elli's class IV fracture was revealed w.r.t. 11 and 21. Non-surgical endodontic treatment was planned for 11 whereas for 21, the initial treatment was MTA apexification followed by definitive obturation.



Figure 1: Pre-operative photograph

Access opening was performed for both 11 and 21. Canals were minimally instrumented with hand K files and irrigated with 3% sodium hypochlorite and saline. After the canals were dried with paper points, calcium hydroxide was placed as an intracanal medicament for 1 week. In the next appointment, obturation was done using lateral condensation technique with size 70 master cone w.r.t. 11. A rolled cone was prepared for 21. MTA was mixed with distilled water according to the manufacturer's instructions and placed into the apical portion of the canal upto 4mm thickness was obtained. The rolled cone was used to condense the mix in the canal. A wet cotton pellet was placed in the canal and the access cavity was sealed with cavif.



Figure 2: MTA apexification w.r.t. 21

At the subsequent appointment i.e, after 2 days, the canal was dried and obturation was performed using the rolled cone technique. Patient was scheduled after a week for the bleaching procedure. After rubber dam isolation, gutta percha was removed 1-2mm below the CEJ. Following this, 1mm layer of GIC barrier was placed over the gutta percha. A mixture of sodium perborate and 30% hydrogen peroxide was made and placed in the pulp chamber and condensed with wet cotton pellet and the access cavity was sealed with cavif. The patient was recalled after 1 week and the same procedure was repeated as there was very little change in the shade of the tooth. Patient was recalled for a review after a week again and at this visit, there was a drastic improvement in the tooth shade.



Figure 3: Postoperative photograph(after 2 weeks)

Discussion:

The choice of treatment regimen for teeth with open apices depends on the individual case and the operator experience and familiarity with handling the various materials. MTA was used for apexification in this case as it has excellent biological properties, good sealing ability, improved marginal adaptation and moreover reduced patient treatment time⁵. In addition, there is less chance of root fracture¹. The apical plug with MTA created an artificial barrier to condense the subsequent root canal filling material, in order to prevent reinfection of the canal system².

Today's society dictates that it is the norm for people to have white teeth. The demand therefore for tooth whitening in dental practice has increased exponentially. The whitening of endodontically treated teeth is carried out by an internal whitening treatment known as 'walking bleach' technique⁶. Non-vital bleaching offers a variety of advantages to the patient. It is fast, easy and inexpensive- especially when compared with its alternatives⁷. The tooth's color was restored safely and beautifully in 2-3 weeks.

Conclusion:

A safe and predictable solution was provided for non-vital discoloured teeth and we saved the patient the time and expense of a veneer or a crown. Single visit apexification with a novel biocompatible material like MTA followed by non-vital bleaching is a boon in effective management of a non-vital discoloured tooth with an open apex.

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