

UNUSUAL OBTURATION MATERIAL IN AN IMMATURE TOOTH: A CASE REPORT AND 3-YEAR FOLLOW-UP

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ABSTRACT

Presence of foreign objects in the root canal system may prevent healing or act as a source of infection in the root canal system. Detailed history, clinical and radiographic examination are necessary to identify and retrieve them. A 33-year old female patient required endodontic retreatment for tooth #11. It was diagnosed as previously endodontically treated with asymptomatic apical periodontitis. Wooden objects were incidentally retrieved from the root canal. The tooth was immature and an apical plug of MTA was placed followed by a fiber post and an all-ceramic FPD. A three-year follow up shows that the patient is asymptomatic and the periapical lesion has healed. The retrieval of the objects in this case facilitated cleaning and shaping and eventually the favorable outcome of the case.

Key Words: Foreign body, root canal therapy, MTA, open apex, fiber post

INTRODUCTION

Presence of a foreign object inside the root canal system may prevent adequate cleaning and shaping thus affecting the quality of the end result. Moreover, these objects could act as a source of infection and can cause pain. Fortunately, they are not common, although they are found in children more than adults due to their habits of placing objects in the oral cavity, causing them to get impacted into the pulp chamber if it is directly communicating with the oral cavity as a result of trauma or a carious exposure or a missing restoration between dental visits. Different types of foreign objects, both radiolucent and radiopaque, have been reported in the literature, such as metal fragments, broken burs, pins, sewing needles, pencil leads, absorbent points, and finger nails.¹⁻⁶ They are mostly diagnosed accidentally during routine clinical and radiographic examination. Therefore, detailed history, clinical and radiographic examination are important in order to aid in understanding the nature, size, location of the object and the degree of difficulty to retrieve them.^{1-3,7}

Foreign bodies are usually reported in the root canals of untreated teeth, however it is rare to find an object following treatment. This case presents a foreign body that was retrieved during root canal retreatment and presents its successful management.

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CASE REPORT

A 33-year old female patient sought treatment for her “unaesthetic front teeth” at the undergraduate students’ clinics of the College of Dentistry, King Saud University. Comprehensive examination showed an ill-fitting, greyish porcelain fused to metal fixed partial denture (FPD) extending from #22-11 replacing #21 (Fig 1). Tooth #11 (FDI) was endodontically diagnosed as previously treated with asymptomatic apical periodontitis (Fig 2). Patient’s history revealed that she received a trauma to her teeth when she fell down at the age of nine, resulting in fracture and discoloration of the central incisors, which were restored at the time. Ten years later, the patient sought treatment for the discoloration, #11 was root canal treated, she was informed that #21 was unrestorable, it was extracted, and the FPD was fabricated, but the patient has been unsatisfied with it. After complete clinical and radiographic examination and case discussion with the patient, it was decided to non-surgically retreat tooth #11 and replace the FPD.

Treatment was initiated, the patient was anesthetized with 1.8 ml lidocaine (1:80,000 adrenaline), the FPD was removed, and rubber dam was applied. Tooth #11 was accessed incisally following the removal of the restoration. Canal contents were removed using Hedstrom files (Dentsply Maillefer, Ballaigues, Switzerland). Examination of the removed contents showed that they were mainly wooden objects covered with a thin orange layer that appear to be gutta-percha (Fig 3). After all of the canal contents were removed, canals were irrigated copiously with 2.5% sodium hypochlorite. Working length was determined and confirmed with a periapical radiograph, and the apex appeared to be incompletely formed. Cleaning and shaping were completed using K-files (Dentsply Maillefer, Ballaigues,

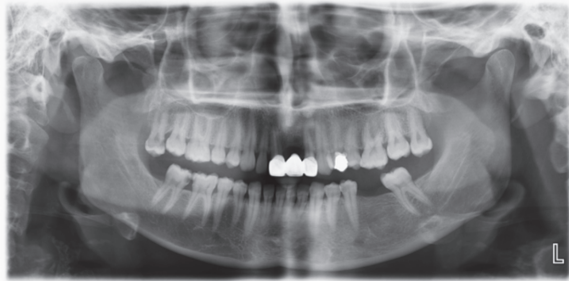


Fig 1: Preoperative panoramic radiograph showing the FPD #11-22



Fig 2: Periapical radiograph of tooth #11 after removal of the FPD and existing restoration



Fig 3: Wooden fragments with an orange covering removed from the canal



Fig 4: Periapical radiograph after placement of the MTA apical plug



Fig 5: Periapical radiograph after cementation of fiber post and FPD

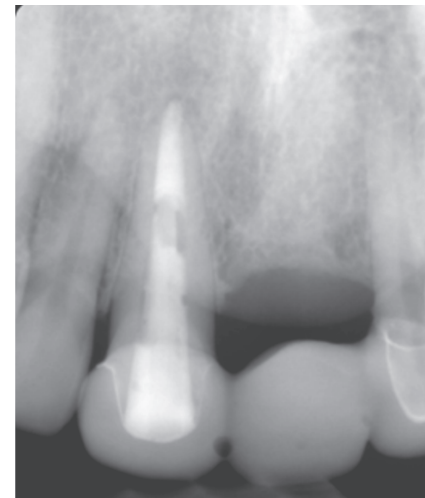


Fig 6: Periapical radiograph taken at the 3-year follow-up

Switzerland) and irrigation with sodium hypochlorite. White mineral trioxide aggregate (MTA) (ProRoot MTA; Dentsply Tulsa Dental Specialties, Tulsa, Oklahoma, USA) was mixed with sterile saline and a 5 mm apical plug was placed and compacted followed by a moist cotton pellet and a temporary restoration (Cavit; 3M ESPE, Seefeld, Germany) (Fig 4) and cementation of a temporary FPD.

One week later, the case was revisited, and the patient was asymptomatic. Local anesthesia and rubber dam were administered as previously mentioned. The intact temporary restoration was removed and setting of MTA was confirmed. As the case was going to receive a post and the canal length was short and did not allow to additionally fill the canals with gutta-percha, it was decided to cement the post directly to MTA. A fiber-post [RelyX™, 3M ESPE, St Paul, Minnesota, USA] was fitted, disinfected, and etched following the manufacturer's instructions. The canal was disinfected with 2.5% sodium hypochlorite and dried with paper

points. The post was cemented using a self-adhesive dual cure universal resin cement [RelyX Unicem™, 3M ESPE, St Paul, Minnesota, USA]. After that, the teeth were prepared and a ceramic FPD from #11 to #22 was fabricated (Fig 5).

The case was followed up at 3 months, 12 months and 3 years (Fig 6). Clinical examination showed normal responses, the patient was asymptomatic and satisfied, and the periapical lesion has healed.

DISCUSSION

Reports in the literature have presented the retrieval of different kinds of instruments and materials from root canals.¹⁻⁷ However, it is rare to retrieve wooden objects,^{1,7,8} which in this case are suspected to be fragments of a toothpick or dental wedges. Since they were covered with an obturation material, they were possibly inserted by the patient between the dental visits, and the dentist proceeded anyway with obturation while they were in the canal, or they were intentionally inserted by the dentist during treatment.⁹

Most cases of foreign objects are reported in immature teeth following trauma and communication of the pulp chamber to the oral cavity. Injuries to the teeth and alveolar structures are most common during the development years of the permanent incisors.¹⁰ Pulpal necrosis following trauma would lead to the arrest of the tooth development resulting in an immature tooth. Instead of the lengthy traditional calcium hydroxide apexification, the standard treatment for such cases has become the single-visit apexification using MTA.¹¹ It can immediately provide an apical stop and allow for an immediate root filling, avoiding the problems with patients' compliance and weakening of the teeth and decreasing the risk of fracture.¹² Moreover, outcome studies have followed up cases for up to 15 years demonstrating a success rate of 96%.¹³

Immature teeth usually present with thin dentinal walls which require reinforcement, preferably by directly bonding to them since gutta-percha alone doesn't provide reinforcement.¹⁴ Prefabricated fiber posts are used for their superior esthetics, better marginal integrity and a more favorable mode of failure when compared to metal ones.¹⁵ Due to the short root, there was insufficient space to place gutta percha over MTA, which required the cementation of the fiber post directly to MTA using a resin cement.¹⁶

Presence of foreign objects or unusual materials in the root canal system may prevent healing or act as a source of infection in the root canal system. It is important to expect and inspect all of the canal contents. The retrieval of the objects in this case facilitated cleaning and shaping and eventually the favorable healing of the case.

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