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Endodontic Management of an Atypical Foreign Body in a Maxillary Central Incisors: A Case Report Of Two Case Instances

Vishnuvarthan Aparna, Eswara Karteek, Dhanabalan Obukavitha

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ABSTRACT: INTRODUCTION: Foreign bodies within the root canal system present a unique challenge in endodontics, especially in pediatric patients with open pulp chambers due to trauma or caries. Children may insert objects into their teeth to alleviate discomfort or remove food debris. These objects can hinder canal debridement, potentially leading to persistent infection or treatment failure. This report discusses two pediatric cases involving non-surgical retrieval of foreign objects from the root canal of maxillary central incisors.

METHODS: Two 13-year-old patients reported to the Department of Pediatric and Preventive Dentistry with a history of traumatic dental injury to the maxillary central incisors, followed by pain and discharge. Clinical and radiographic examinations revealed foreign objects in the root canal system. After isolation and debridement, the foreign bodieswere then retrieved. The treatment was completed with calcium hydroxide dressing followed by obturation with gutta-percha and resin sealer.

RESULTS: Both foreign objects were successfully retrieved non-surgically. In Case 1, a metal pin was removed, and the canal was obturated conventionally. In Case 2, a pencil lead tip was removed, and apexification was carried out using mineral trioxide aggregate (MTA), followed by obturation and post-endodontic restoration. Both patients were asymptomatic at follow-up and showed signs of healing.

DISCUSSION: Foreign objects in root canals are often seen in pediatric patients and can complicate endodontic therapy. Early diagnosis through radiography and patient history is crucial. Non-surgical retrieval is preferred and usually successful if the object is within the coronal or middle third of the root canal. Tools such as H- and K-files, tweezers, and irrigation solutions are effective when applied skilfully. Surgical approaches should be reserved for cases where non-surgical techniques fail.

CONCLUSION: Foreign body impaction in root canals can be effectively managed with conservative methods when diagnosed early. A tailored approach based on the location and type of object ensures a favourable prognosis. Proper patient education and timely intervention are vital in preventing such occurrences and improving treatment outcomes.

KEYWORDS: Foreign body, Foci of infection, Retrieval, Non-surgicalapproach, Root canal treatment

I. INTRODUCTION:

The ideal outcome of root canal treatment is the eradication of microorganisms from the root canal systemor at least their significant reduction to levels compatible with peri-radicular tissue healing [1]. Some children while trying to remove the food particles from the tooth, they insert the foreign objects into oral cavity, particularly high when the pulp chamber is open either because of traumatic injury or large carious exposure. They are a possible source of infection [2]. Foreign bodies or broken root canal instruments hinders the clinician from thoroughly cleaning and shaping the canal system and thus compromises the outcome of the treatment[4].The removal of foreign body from the root canal system in most cases is difficult and at times impossible. There are various methods and devices developed to retrieve them. It is the dentist whoshould evaluate the options of attempting to remove the foreign body, bypassing it or leaving the fracture portion in the root canal itself. This decision should be made with consideration for the pulp status, canal infection, canal anatomy, the position of the fractured foreign body and its type [4]. These foreign objects can be easily retrieved if they are located within the pulp chamber, but once the object has been pushed apically, their retrieval may be complicated. Apical surgical procedures may sometimes be unavoidable [3].

II. CASE REPORT:

CASE 1

A 13-year-old healthy female patient came to the Department of Pediatric and Preventive Dentistry, Vinayaka Mission's Sankarachariyar Dental College with a chief complaint of severe pain in the upper central incisor region for past one week. According to the patient's history, the crown of the right maxillary central incisors had been fractured four years backbecause of trauma. The patient went to a general dentist the same day but

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due to patient's parent'snegligence they didn't continue the treatment. The history of pain was acute, sharp, intermittent, non-radiating type of pain which gets relieved by taking medications. Patient also gives a history of bleeding and pus discharge for the past 1week. No history of swelling. Clinical examination reveals Ellis class IIfracture of the right central incisor with open pulp chamber occluded with food material (Fig. 1)

Fig.1 Fractured right maxillary central incisor

Intra oral periapical radiographic examination of the region revealed the presence of a radio opaque object in the upper middle third of the root canal space of maxillary right central incisor.Then we decided to retrieve the foreign object by nonsurgical means and thereafter complete the endodontic treatment.

Fig.2 Metal pin in the root canal

The access was modified and removal of food plugs using a spoon excavator was performed. The pulp chamber was then irrigated with 5% sodium hypochlorite and normal saline solution. An ISO no.25 H-file was inserted between the dentinal wall and the foreign body and bypassed along its length (Fig.3)Thefile was thus engaged with the foreign object and retrieval was attempted by gentle coronal rasps. The loosened object was grasped with a tweezer and removed from pulp chamber. The retrieved object was found out to be a metal pin which was roughly three millimetres in length. (Fig.3, Fig.4, Fig.5)

Fig.3 Bypassing the metal pin by no.25 H-file

Fig.4 Metal pin retrieval and root canal after retrieval

Fig.5 Retrieved metal pin and wooden stick piece

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The root canal working length was measured by Radiographic method followed by cleaning and shaping was done with hand files and liberal irrigation of 5% sodium hypochlorite and normal saline. The canal was dried with paper points and the tooth received calcium hydroxide dressing. The child was recalled after one week and the tooth was obturatedwith gutta percha and a resin sealer, followed by post endodontic restoration Fig.6 and Fig.7

Fig.6

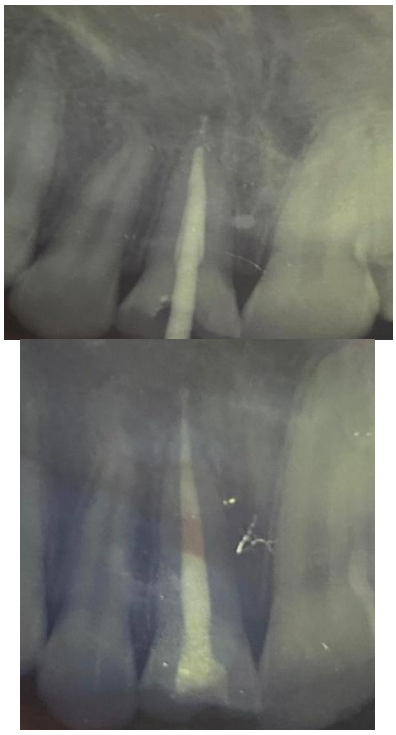

Fig.7 Obturation and post endodontic restoration

CASE 2

A 13-year-old male patient was referred to the Department of Pediatric and Preventive Dentistry, Vinayaka Mission's Sankarachariyar Dental College, with a chief complaint of pain in the upper central incisor region for past 4days.According to the patient's history, the crown of the right maxillary central incisors had been fractured two years earlier because of trauma.The intraoral periapical radiograph in relation to right maxillary central incisor revealed a radio-opaque object in the middle third of the canal. On careful history from the patient, it was revealed that the patient had inserted a piece of lead tip into the open pulp chamber of the right maxillary central incisor.It was decided to retrieve the foreign object by nonsurgical means and thereafter complete the endodontic treatment. Rubber dam isolation of the tooth followed by removal of food plugs using a spoon excavator was performed. The pulp chamber was then irrigated with 5% sodium hypochlorite solution and the access cavity was refined. An ISO no.25 K file was inserted between the dentinal wall and the foreign body and bypassed along its length. The circumvented file was thus engaged with the foreign object and retrieval was attempted by gentle coronal rasps.The loosened object was grasped with a tweezer and removed from pulp chamber. The retrieved object was found out to be pencil lead tip. The root canal working length was measured by Radiographic method followed by cleaning and shaping was done with hand files and irrigation of 5% sodium hypochlorite. The canal was dried with paper points and the tooth received calcium hydroxide dressing.The child was recalled after one week and apexification was done with MTA. A week later obturation completed by using Gutta-percha and a resin sealer followed by post endodontic restoration Fig.8 and Fig.9

Fig.8

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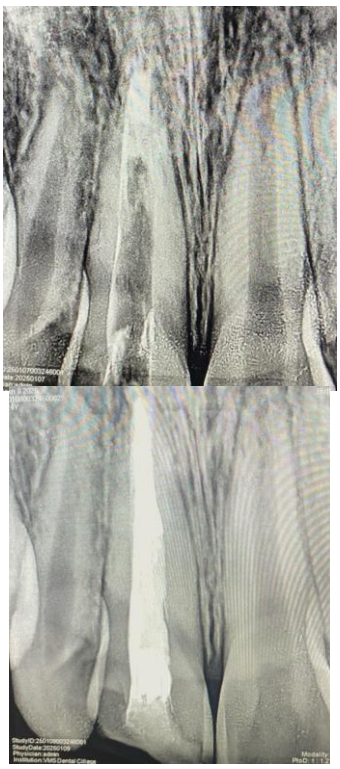

Fig.9

III. DISCUSSION:

Individuals inserting objects into their teeth is a common phenomenon irrespective of age, with case reports mentioning different ages including a two-year-old child to more than 50-year-olds. However, most of the reports cited foreign bodies in both deciduous and young permanent teeth, indicating the tendency of children to place objects into mouth [2]. The foreign objects to be lodged in the pulp chamber or root canals of the tooth, which ranged from stapler pins, pencil leads, darning needles, metal screws, beads, plastic chop sticks, hat pins, dress maker pins and conical metallic objects. Sometimes these objects are infectious. Parents or guardians must have an eyeon this type of deleterious habit. A thorough history, particularly concerning the habits of the child, may elicit vital information regarding the nature of objects. In some cases, the child might have attempted to remove the food debris accumulated in the access cavity with the staple and in the process, pushed the object into the root canal space.

A radiograph can be of diagnostic significance, especially if the foreign body is radio-opaque. Specialized radiographic techniquessuch as Radiovisiography, three-dimensional CAT (Computerized axial tomography) scans can play a pivotal role in the localization of these foreign objects inside the root canal.Many methods are described to remove broken instruments or objects within root canals, such as hand instrumentation, ultrasonic devices, Masserann Kit, canal finder system or sometimes surgical methods also are employed. Retrieval of the object may be challenging when the object is lodged in periapical region. In such cases, periapical surgery or intentional reimplantation should be considered as potential options for removal.

IV. CONCLUSION:

In the literature, removal of foreign objects from root canals has been widely discussed and various techniques have been suggested. Foreign bodies in the root canal system should be removed for successful endodontic treatment. These objects can clearly cause infection and pain. With appropriate diagnostic and treatment tools, as well as good patient cooperation, management of foreign object removal from root canals can be quite straightforward. Non-surgical endodontic treatment should be tried first, but in some cases endodontic surgery may be required.Microscopy and ultrasonic tips are used as auxiliary tools, increasing the chance of removal and ensuring the integrity of the tooth structure.

PATIENT PERSPECTIVE:

Patient's parents were satisfied with the outcome and appreciated the coordinated care their child received. Feedback was obtained post treatment.

INFORMED CONSENT:

Informed written consent was obtained from the patient's legal guardians for the procedure, investigations, and publication of this case report for educational and clinical reference.

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