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## Case report

# Patient induced unusual metallic obturation of the root canal of permanent maxillary central incisor with an immature apex – A rare case report



Manoj Mahadeo Ramugade\*, Kishor Dattatray Sapkale<sup>1</sup>,  
Sachin Shashikant Metkari<sup>2</sup>

Department of Conservative Dentistry and Endodontics, Nair Hospital Dental College, Mumbai Central, Mumbai-08, India

### ARTICLE INFO

#### Keywords:

Foreign objects  
Sewing needles  
Immature apex  
Non-surgical endodontic treatment

### ABSTRACT

Discovery of multiple foreign objects in the root canal is unusual and their removal is often difficult and challenging procedure. Entrapment of the foreign object in the pulp chamber or in root canal usually occur accidentally in children with the habit of chewing or placing various objects in the oral cavity. Clinically it was often encountered in tooth with wide carious lesion, exposed pulp chamber due to trauma or tooth left open for the drainage during root canal treatment. This impacted foreign body may act as a potential source of pain or infection. The attempt to retrieve such foreign object from the root canal with immature apex increases the risk of its displacement into periapical area. The present case report describes an unusual case of a patient with two metallic sewing needles inadvertently broken down in the root canal of the permanent maxillary left central incisor and it's successful retrieval by non-surgical endodontic treatment.

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## Introduction

Discovery of a foreign object in the root canal is an uncommon finding and often revealed accidentally during routine radiographic examination. Entrapment of such foreign object in the pulp chamber or in root canal is usually encountered in children with the tendency of chewing or placing different objects in the oral cavity. Ingestion or aspiration of the foreign object could be frightening and stressful situation [1]. In most cases parents are unaware of the bizarre situation as children are scared to inform

them. The impacted foreign object may act as potential source of infection resulting in pain or swelling.

Various foreign objects lodged in the pulp chamber and root canal of the tooth have been reported in the literature such as, stapler pin [2,3], pencil leads [4], darning needles [5], metal screws [6], beads [7], nail [8], plastic chop stick [9], hat pins [10], dressing pins [11], ornament piece [12] and a conical metallic object [13].

The present case report describes a patient with two sewing needles entrapped in the root canal of permanent maxillary left

\*Corresponding author. Tel.: +91 9869159131, +91 9664541227.

E-mail addresses:

[manojramu05@yahoo.co.in](mailto:manojramu05@yahoo.co.in), [manojmids05@yahoo.co.in](mailto:manojmids05@yahoo.co.in) (M.M. Ramugade), [drkishorsapkale@gmail.com](mailto:drkishorsapkale@gmail.com) (K.D. Sapkale), [drssmetkari@yahoo.co.in](mailto:drssmetkari@yahoo.co.in) (S.S. Metkari).

<sup>1</sup>Tel.: +91 8149797060.

<sup>2</sup>Tel.: +91 9167699805.

central incisor with an immature apex and its successful conservative management.

## Case report

A healthy 13-year-old male patient reported with his father to the Department of Conservative Dentistry and Endodontics, with a complaint of pain and pus discharge from upper front tooth region since last four days.

Patient's history and intra-oral examination exhibited following findings:

- History of trauma to maxillary anterior teeth; 5 years ago.
- Fractured tooth 21 (Federation Dentaire Internationale) up to the middle third with discoloured crown (Fig. 1).
- Tooth 21 showed a small incisal opening into the pulp chamber (Fig. 2).
- Presence of draining sinus on the gingiva near the apex of tooth 21.
- Pain on percussion associated with tooth 21.

Electric pulp test (EPT) showed no response in tooth no. 21 and a normal response exhibited in teeth nos. 11, 12 and 22. Intra-oral periapical radiograph of tooth 11 and 21 revealed, the presence of two slender, pointed radiopaque images with radiolucent eyes; appearing one above the other, in the middle and apical thirds of the root canal of tooth 21. Tooth 21 also showed an immature apex and periapical radiolu-



Fig. 1 - Pre-operative photograph - labial view - tooth 21.



Fig. 2 - Pre-operative photograph - palatal view - tooth 21.

gency (Fig. 3). Widening of periodontal ligament was evident in tooth 11.

After taking the patient and his parent into confidence a careful enquiry of patient regarding the presence of the foreign objects in the tooth 21 was done. It was revealed that, the patient frequently used sewing needle as a toothpick to clean the lodged food from pulp chamber of tooth 21. Three months back during one of such attempts, one sewing needle was inadvertently broken down in the root canal of tooth 21. Subsequently patient tried to remove that needle from the root canal with the help of another sewing needle. Unfortunately, the second needle also broke over the first embedded needle. After this incidence the patient did not inform his parents about the broken needles inside the tooth, due to fear of getting reprimanded. On further questioning, patient revealed that he used to get sewing needles from his uncle who was a professional tailor. After evaluating the clinical and radiographic evidences; the following treatment plan was advised and informed consent of patient's parent was obtained.

- (1) To retrieve both foreign objects by a simple non-surgical technique.
- (2) Endodontic treatment of tooth 21 followed by aesthetic restoration.

## Treatment sequence

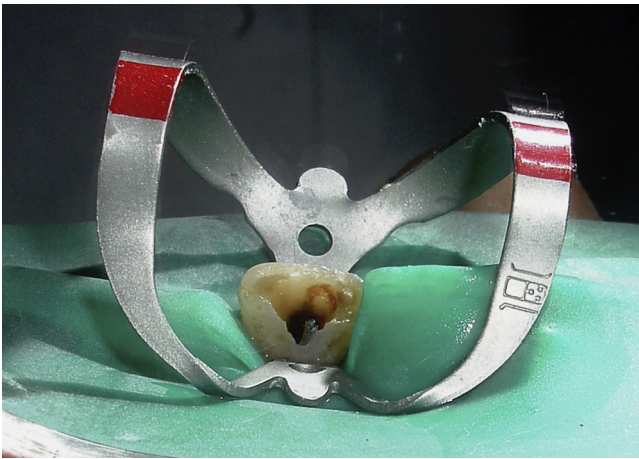
- (1) Removal of coronal sewing needle:

The tooth 21 was isolated under rubber dam and access cavity was prepared under 3.5 × magnifying loupes. The debris from pulp chamber was cleaned by copious irrigation with physiologic saline. To prevent the rusting of the



Fig. 3 - Pre-operative intra-oral periapical radiograph showing two foreign objects in root canal of tooth 21 resembling the heads of sewing needles.

metallic objects in root canal and its accidental escape into periapical tissues through an open apex; irrigation with 5.2% sodium hypochlorite was initially avoided. Exploration of the root canal was done with No.10 Kerr-file (K-file, Mani Inc., Japan) to feel any resistance in the root canal. Though the root canal was wide; the foreign object offered a resistance for its easy retrieval. Firstly instrumentation with No. 10 K-file was done to bypass the coronal object from the mesial and then from the distal aspect of root canal wall. Later, the root canal was sequentially bypassed with No. 15, No. 20 and No. 25 K-files. Subsequently two, No. 25 Headstrom-files (H-file), one from mesial and other from distal aspect of the root canal were inserted. Files were twisted together to engage the coronal object and pulled incisally using braiding technique. After such multiple attempts, the coronal object moved incisally in pulp chamber. It was retrieved successfully with the tweezers and

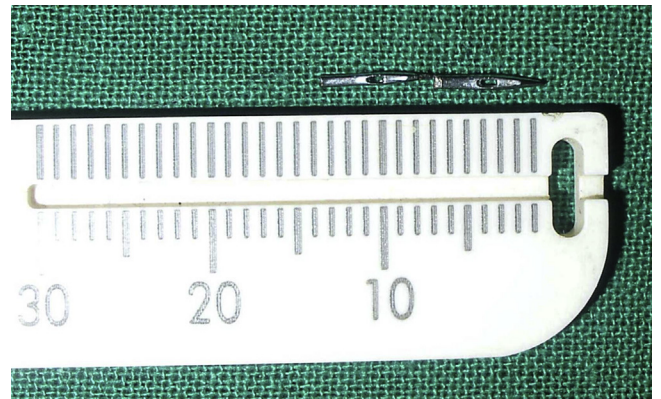


**Fig. 4 – Intra-oral photograph of retrieved coronal needle in the access cavity – tooth 21.**

examined carefully (Fig. 4). The object was identified as a sewing needle measured about 7 mm in length and 1.5 mm width. Radiograph of tooth 21 was taken to visualise and ensure the position of the impacted apical object (Fig. 5).

(2) Removal of apical sewing needle:

Similarly, exploration of apical portion of root canal of tooth 21 was done using No.10 K-file but the apical object offered more resistance for its retrieval than coronal object. Similar steps were followed for retrieval of the apical object. The apical object was bypassed with No. 25 K file from the mesial aspect. Subsequently No. 25 H-file was inserted from the mesial aspect and engaged apically to prevent the slippage of the object into the periapical area. An activated ultrasonic scaler tip was put in contact with the metallic blank of No. 25 H-file to facilitate the loosening of an object. Within few minutes the apical object felt slightly loosened and was retrieved successfully in similar manner as for coronal needle. An apical object was also found to be a sewing needle (Fig. 6). Confirmatory radiograph was taken to ensure



**Fig. 6 – Photograph showing two retrieved sewing needles each measured 7 mm in length.**



**Fig. 5 – Intra-oral periapical radiograph after retrieval of coronal sewing needle from root canal – tooth 21.**



**Fig. 7 – Intra-oral periapical radiograph after retrieval of both sewing needles from the root canal – tooth 21.**

the retrieval of both the sewing needles from the root canal of tooth 21 (Fig. 7). Following the retrieval of both the needles, working length was established (Fig. 8). Cleaning and shaping of the root canal was accomplished by conventional technique. Final irrigation of the root canal with 5.25% of sodium hypochlorite using Endo-activator (Dentsply, Tulsa Dental) was performed. Calcium hydroxide was placed as intracanal medicament in tooth 21 and the radiograph was taken (Fig. 9). Intracanal calcium hydroxide was replaced in tooth 21 after 1 month recall. At this time EPT in teeth 11, 12 and 22 showed normal response compared to control teeth.

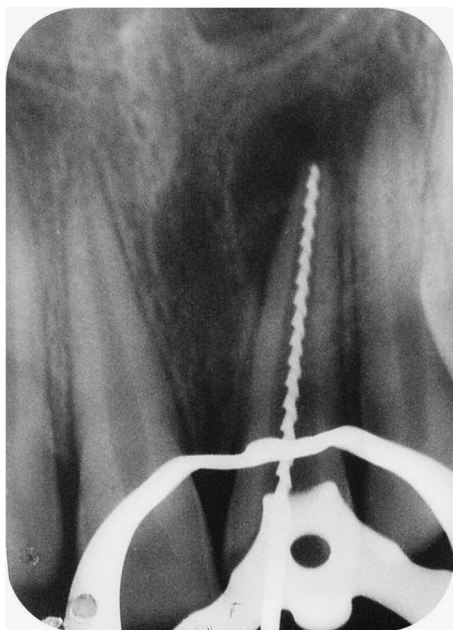


Fig. 8 – Working length radiograph – tooth 21.



Fig. 9 – Immediate intra-oral periapical radiograph after intracanal calcium hydroxide cement placement in tooth 21.

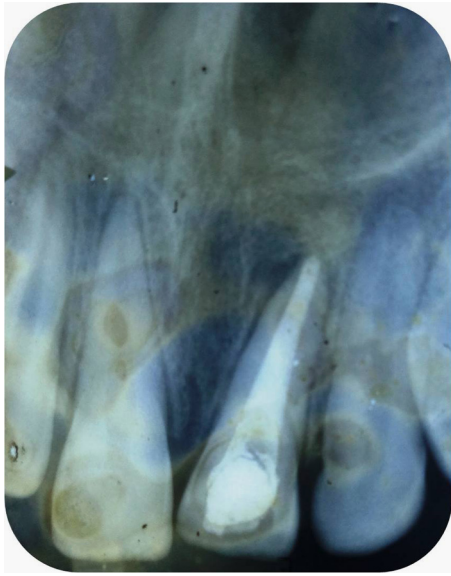
Patient was recalled for regular follow-up of 3 months. Periapical radiograph of tooth 21, revealed the presence of unresorbed calcium hydroxide in the periapex of tooth 21 (Fig. 10). After 6 months follow-up, the periapical radiograph of tooth 21 exhibited the complete resorption of periapical calcium hydroxide with calcific apical barrier formation. At this time root canal obturation using rolled cone method was planned. To prepare a customised master cone, three No. 80 standardized gutta percha (GP) cones were brought together and passed over an alcohol flame. Immediately cones were rolled together on a glass slab with the help of another cooled glass slab. The customised GP cone was softened over a flame and then tried as a master cone in the root canal of tooth 21. The procedure was repeated for several times till apical tug back was achieved. The root canal was obturated using the prepared customised GP cone [14] (Fig. 11). After 1 year follow up, EPT of teeth 11, 12 and 22 showed normal response as the control teeth and resolving periapical lesion was observed in the radiograph of tooth 21 (Fig. 12). Patient was scheduled for the post endodontic restoration and an aesthetic crown with tooth 21 but unfortunately, the patient failed to report for the further follow ups as he had been shifted to reside to his native place.

## Discussion

Patient reporting with the presence of foreign object in the tooth is a rare scenario in dental office. Everytime the dental office may not be prepared to tackle such situation which demands combination of skills, immediate investigations, various radiographs and necessary instruments. Retrieval of the foreign object may be done by conservative means or need surgical intervention depending on position of the foreign object in the root canal and associated complexity in its retrieval. There is a need for proper classification of foreign



Fig. 10 – Intra-oral periapical radiograph after 3 months follow up – tooth 21.



**Fig. 11 – Post obturation intra-oral periapical radiograph after 6 months follow up – tooth 21.**



**Fig. 12 – Intra-oral periapical radiograph after 1 year follow-up showing healing of periapical pathology – tooth 21.**

objects found in teeth and oral cavity with an appropriate treatment protocol to be followed in such special situations.

A tooth with wide carious lesion, traumatic pulp exposure or tooth left open for the drainage; endangers the patient to a risk of foreign body entrapment in the root canal. Thus in case where access cavity is left open for the drainage, the patient and their parents should be instructed about the potential risk of foreign object impaction in the pulp chamber or the root canal of involved tooth. The practitioner should close the access cavity as soon as the purpose of drainage is accomplished.

Various radiographic techniques such as parallax views, triangulation techniques, stereo radiography and tomography [2] play a pivotal role in localisation of the foreign object,

in determining its type, location and size [15]. For retrieval of the foreign object from root canal; use of ultrasonic instruments [16], Masserann kit [17], modified Castroviejo needle holder [18] and the dental microscope [19] are reported in literature.

Removal of one foreign object from the root canal is often tedious. However, in the present case it becomes difficult and more risky procedure; when two foreign objects present one above the other and snugly fit in the root canal of tooth with an immature apex. These foreign objects block the root canal and prevent its complete negotiation. Thus, their removal becomes necessary to eradicate the infection and for successful endodontic treatment of affected tooth. To remove such objects, they should be made free from hindrance and at the same time reasonable care should be taken to prevent its displacement into periapical area. In present case, two impacted sewing needles were retrieved with H-files and indirect ultrasonics causing minimal damage to subjacent root dentin [19] avoiding the need of periapical surgery or intentional reimplantation [20].

After retrieval of the foreign object from the tooth with an open apex, closure of the apex is of paramount consideration. Traditionally apexification was performed using intracanal calcium hydroxide due to its long term antimicrobial effect [21], predictable induction of apical closure and its low cost. Caution should be taken for long term use of intracanal calcium hydroxide; as it would significantly increase the risk of root fracture after long term application [22,23]. However, with the advent of Mineral Trioxide Aggregate (MTA), apical barrier is achieved in one visit. The advantages of MTA are reported as, less crucial patient compliance, no alteration in physical properties of dentin and earlier restoration of the tooth [24]. Though MTA is biocompatible material and the procedure is time saving; its cost is the major factor of consideration for its routine clinical use in tertiary dental care centres in developing countries.

## Summary

The case report describes conservative management of the patient having a complicated crown fracture; along with accidentally impacted sewing needles in the root canal of tooth 21, with an immature apex and periapical pathology.

## REFERENCES

- [1] R. Aduri, R.E. Reddy, K. Kiran, Foreign objects in teeth: retrieval and management, *J. Indian Soc. Pedod. Prev. Dent.* 27 (2009) 179-183.
- [2] N. Macauliffc, N.A. Drage, B. Hunter, Staple diet: a foreign body in a tooth, *Int. J. Paediatr. Dent.* 15 (2005) 468-471.
- [3] K. Chand, S. Joseph, J.M. Varughese, M.G. Nair, S. Prasanth, Endodontic management of an unusual foreign body in a maxillary central incisor, *J. Conserv. Dent.* 16 (2013) 474-476.
- [4] J.B. Hall, Endodontics – patient performed, *ASDC J. Dent. Child.* 36 (1969) 213-216.
- [5] H. Nernst, Foreign body in the root canal, *Quintessence Int.* 23 (1972) 26.

- [6] A.R. Prabhakar, N. Basappa, O.S. Raju, Foreign body in a mandibular permanent molar: a case report, *J. Indian Soc. Pedod. Prev. Dent.* 16 (1998) 120-121.
- [7] V.V. SubbaReddy, D.S. Mehta, Beads, *Oral Surg. Oral Med. Oral Pathol.* 69 (1990) 769-770.
- [8] C. Pinky, K.S. Ravi, A. Krishna, A. Vanka, Fingernails – foreign objects in root canal: a case report, *J. Clin. Exp. Dent.* 3 (Suppl. 11) (2011) e386-e389.
- [9] M. Toida, H. Ichthara, T. Okutomi, K. Nakamura, J.I. Ishimaru, An unusual foreign body in an unerupted supernumerary tooth, *Br. Dent. J.* 173 (1992) 345-346.
- [10] R.M. Zillich, T.N. Pickens, Patient-included blockage of the root canal: report of a case, *Oral Surg. Oral Med. Oral Pathol.* 54 (1982) 689-690.
- [11] C.H. Turner, An unusual foreign body, *Oral Surg. Oral Med. Oral Pathol.* 56 (1983) 226.
- [12] A.R. Prabhakar, S. Namineni, H.N. Subhadra, Foreign body in the apical portion of a root canal in a tooth with an immature apex: a case report, *Int. Endod. J.* 41 (2008) 920-927.
- [13] I.B. Lamster, J.T. Barenie, Foreign objects in the root canal: review of literature & report of 2 cases, *Oral Surg. Oral Med. Oral Pathol.* 44 (1977) 483-486.
- [14] J.L. Gutmann, J.F. Heaton, Management of the open (immature) apex. 2. Non-vital teeth, *Int. Endod. J.* 14 (1981) 173-178.
- [15] G. Holla, S. Baliga, R. Yeluri, A.K. Munshi, Unusual objects in the root canal of deciduous teeth: a report of two cases, *Contemp. Clin. Dent.* 1 (2010) 246-248.
- [16] D.L. Meidinger, B.J. Kabes, Foreign object removal utilizing the cavi-endo ultrasonic instrument, *J. Endod.* 11 (1985) 301-304.
- [17] B.D. Williams, A.M. Bjorndal, The Masserann technique for the removal of fractured posts in endodontically treated teeth, *J. Prosthet. Dent.* 49 (1983) 46-48.
- [18] U.G. Fros, J.O. Beng, A method for removal of broken endodontic instruments from root canals, *J. Endod.* 9 (1983) 156-159.
- [19] S.V. Walvekar, Y. Al-Duwani, A.M. Al-Kandri, O.A. Al-Quoud, Unusual foreign objects from root canal, *J. Endod.* 21 (1995) 526-527.
- [20] N. Srivastava, N. Vineeta, Foreign body in the periradicular area, *J. Endod.* 27 (2001) 593-594.
- [21] J.F. Siqueira Jr., H.P. Lopes, Mechanisms of antimicrobial activity of calcium hydroxide: a critical review, *Int. Endod. J.* 32 (5) (1999) 361-369.
- [22] J.O. Andreason, B. Farik, E.C. Munksgaard, Long term calcium hydroxide as a root canal dressing may increase risk of root fracture, *Dent. Traumatol.* 18 (2002) 134-137.
- [23] B. Rosenberg, P.E. Murray, K. Namerow, Effect of calcium hydroxide root filling on dentin fracture strength, *Dent. Traumatol.* 23 (2007) 26-29.
- [24] V. Giuliani, T. Baccetti, R. Pace, G. Pagavino, The use of MTA in teeth with necrotic pulps and open apices, *Dent. Traumatol.* 18 (2002) 217-221.