

## Accidental Ingestion and Uneventful Retrieval of an Endodontic File in a 4 Year Old Child: A Case Report

Prashant Bondarde<sup>1</sup>, Anishri Naik<sup>2</sup>, Sudha Patil<sup>2</sup>, Parth H Shah<sup>3</sup>

### Contributors:

<sup>1</sup>Professor & Head, Department of Pediatric & Preventive Dentistry, Annasaheb Chudaman Patil Memorial Dental College, Dhule, Maharashtra, India; <sup>2</sup>Reader, Department of Pediatric & Preventive Dentistry, Annasaheb Chudaman Patil Memorial Dental College, Dhule, Maharashtra, India; <sup>3</sup>Post-graduate Student, Department of Pediatric & Preventive Dentistry, Annasaheb Chudaman Patil Memorial Dental College, Dhule, Maharashtra, India

### Correspondence:

Dr. Patil S. Department of Pedodontics and Preventive Dentistry, Annasaheb Chudaman Patil Memorial Dental College, Dhule, Maharashtra, India. Phone: +91-9158695950. Email: dr.sudhapatil@gmail.com

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### Abstract:

The majority of foreign body ingestions occur in the pediatric population, with a peak incidence between the ages of 6 months and 6 years. Safety during dental treatment of children cannot be overemphasized. Uncooperative, mentally and physically handicapped children are more prone to ingestion or aspiration of dental instruments than other populations. In any event, it is recommended that dental practitioners examine their instrument before use, as a safeguard against any slippage, breakage. Treatment with any endodontic device requires the use of proper isolation such as rubber dam.

**Key Words:** Accidental ingestion, endoscopy, foreign body, gastrointestinal tract, rubber dam, swallowing

### Introduction

Endodontic treatment has a great advantage over-extraction. We can save many teeth by endodontic procedures rather than extraction, and it has been successful and conservative mode of treatment. However, sometimes mishaps such as accidental ingestion of the endodontic instrument may occur if the treatment is carried out without application of rubber dam, especially in the child patient. Such mishaps are rare but potentially very harmful to the patients and causes anxiety to the clinician.

When an accidental ingestion of an endodontic instrument occurs, endodontist should have a basic knowledge about the diagnostic procedure, complications, methods of retrieving the swallowed instrument, as well as the ability to reassure the patient.<sup>1</sup>

For the endodontic instruments, the prevalence for aspiration was 0.0009/100,000 root canal treatments and the prevalence for ingestion was 0.08/100,000 root canal treatments.<sup>2</sup> The reason for the relatively low reported incidence, when endodontic equipment is involved, may be the use of rubber dam. Aspiration of foreign bodies during dental treatment is rare, however, when such accidents happen it is considered a major complication in terms of the treatment needed to avert this event, and the impact on the patient's health.

The present case report describes a rare case of swallowing of a hand pro taper file used for pulpectomy in 4 years old patient and also provides the knowledge about possible complications that may arise due to accidental swallowing of such instruments and their treatment modalities depending upon the location of the instrument either in gastrointestinal tract or respiratory tract.

### Case Report

A 4-year-old male patient reported to the department of pediatric and preventive dentistry, Annasaheb Chudaman Patil Memorial Dental College, Dhule with pain in his lower left back tooth. On radiographic examination, pulpectomy was planned for the tooth 74. On the same day, access opening was done with tooth 74 under local anesthesia, pulp was extirpated, working length was determined and bio-mechanical preparation was in progress when patient suddenly moved his head due to which endodontic instrument (size Sx Pro Taper hand file, Dentsply) slipped from operator's hand and patient swallowed it.

After this unfortunate event, pulpectomy procedure was immediately discontinued, and measures were taken to retrieve the file. The patient was kept in the prone position with the head at lower level than the limb, and 4-5 thrusts were given on his back expecting the expulsion of the instrument. However, it did not work. Hence, patient was immediately shifted to the Annasaheb Chudaman Patil Memorial Medical College, Dhule in emergency medicine department. There, a physician in charge advised him for the postero-anterior chest radiograph. A postero-anterior chest radiograph demonstrated the presence of sharp foreign object at the level L2-L3 (Figure 1), just below the shadow of the diaphragm. The clinical and radiographic assessment done and opinion sought from the pediatric surgeon, who advised to keep the patient under



**Figure 1:** Chest radiograph showing protaper file at the level of L2-L3 (immediately after ingestion).

observation as the radiographic findings were suggestive of presence of endodontic instrument in the gastrointestinal tract (stomach) and not in the respiratory tract and patient was free of any respiratory distress or coughing or sneezing. Clinically, smooth breathing sound was noticed and no tenderness or pain was present on palpation of the area in which foreign body was present.

High risk consent was obtained from the parents accompanying the child and patient was kept under high fibrous diet, and syrup chremaffin was prescribed for allowing the rapid transport of the instrument within the gastrointestinal tract. Patient was kept under close observation in the department of emergency medicine. All the vital statistics were obtained and regularly noted every 2 h. Serial radiographic examinations were performed to monitor the migration of the instrument. A repeated radiograph was taken of postero-anterior view of abdomen, 24 h after the ingestion of the instrument. This radiograph suggested the presence of the endodontic instrument in the caecum of the large intestine (Figure 2).

Finally, 41 h after the file ingestion, the file was found in the faeces, and confirmatory radiograph was obtained to make sure the absence of any foreign object in the gastrointestinal tract (Figures 3 and 4).

Three weeks later, pulpectomy was completed in the Department of Pediatric and Preventive Dentistry under the rubber dam isolation.



**Figure 2:** Chest radiograph showing movement of protaper file after 24 h of ingestion.



**Figure 3:** Chest radiograph after file was excreted.

#### Discussion

Ingestion of dental objects is more common than aspiration. Whenever a dentist loses a dental instrument, dental materials or any other foreign object inside oral cavity, he must consult a radiologist even if the patient has no complaints.



**Figure 4:** Retrieved protaper file.

According to Hodges *et al.*, mentally and physically handicapped children are more prone to ingestion or aspiration of dental instruments than other populations. In any event, they recommended that dental practitioners examine their instrument before use as a safeguard against any slippage, breakage.<sup>2</sup> Treatment with any endodontic device requires the use of a rubber dam.

Surprisingly, in a survey by Whitworth *et al.* very few (<20%) of the surveyed dentists were using rubber dam routinely while the vast majority of them (60%) have reported never to use rubber dam while performing endodontic procedures.<sup>3</sup>

There are many possible symptoms of foreign body ingestion such as chest pain, acute dysphagia, vomiting, choking, drooling, blood stained saliva. Respiratory symptoms as wheezing, coughing, dyspnea may suggest that the foreign object has lodged in the upper gastrointestinal or respiratory tract. 90% of the ingested dental instrument passes out of body through gastrointestinal tract.

Endodontic files, which are used for root canal cleaning procedure, have been reported to pass through gastrointestinal system within 3 days, but 10% require endoscopic removal and only 1% will require surgical intervention.<sup>4</sup>

Patients with stomach or small-intestine foreign bodies of width <2 cm or length <6 cm can be discharged home with instructions on symptoms that should prompt their re-attendance.<sup>5</sup> If a foreign object found to be lodged in respiratory tract, bronchoscopy is a must.

#### **Recommended management protocol**

For the sharp objects like endodontic file, when lodged in the gastrointestinal tract or respiratory tract, the management

protocol is endoscopic retrieval/bronchoscopy or the careful monitoring with periodic radiographs should be undertaken. If the object fails to progress after 72 h, or the signs of bleeding, perforation, obstruction are noticed, laparotomy should be carried out immediately.

#### **Prevention of such mishaps in clinical practice**

All the endodontic procedure should be strictly carried out under rubber dam isolation. Rotary files are preferred over hand files for the endodontic treatment of the pediatric patient. If hand files are used, the floss should be tied to the handle of the files with the length of 18 inches or more for easy retrieval of the instrument. Dentist should always work in dry environment rather than in wet conditions to minimize the chances of slippage of the instrument.

#### **Conclusion**

The accidental ingestion or aspiration of the dental instrument is the potential life-threatening complication. In such cases, "prevention is better than cure" is applicable. Rubber dam isolation should be strictly applied, and dentist should be aware of handling such situation by having the knowledge of diagnosis, immediate retrieval measures and providing emergency treatment to the patient.

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