



## CASE STUDY

### INGESTION AND RETRIEVAL OF PRO TAPER ENDODONTIC FILE IN A 9-YEAR-OLD CHILD

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#### ABSTRACT

Foreign body ingestions are encountered more frequently in children, elderly, mentally and physically challenged individuals when compared to normal and healthy individuals. In this report, a case of accidental ingestion of a hand pro taper file by a 9-year-old child is presented. The management of the incident, factors to be considered in management, possible complications, identification and management of complications have also been discussed. Recommendations for prevention of mishap has also been included.

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## INTRODUCTION

Pediatric foreign body ingestion is a worldwide problem (Susy Safe Working Group, 2012). Ingestion of various foreign bodies like coins (Aydoğdu Set *et al.*, 2009), toy parts (Singh *et al.*, 2014), batteries (Athanasadi *et al.*, 2002), magnet (Vijaysadan *et al.*, 2006), safety pins (Gün *et al.*, 2003), sharp objects, (Arana *et al.*, 2001) etc. have been reported. Dental instruments are routinely introduced in the oral cavity during treatment procedures and this if swallowed accidentally could lead to disastrous effects (Yadav *et al.*, 2015). The present case report describes a case of swallowing of hand pro taper file by a 9-year-old child. The management of the mishap and measures to avoid the same have been discussed.

### Case report

A 9-year-old female patient reported to the Department of Pedodontics and Preventive Dentistry with pain in lower left back teeth region. The child was mentally retarded and showed signs of delayed developmental milestones. Clinical examination revealed deep dental caries in lower left first permanent molar. After radiographic evaluation, root canal treatment was planned for the tooth. During the child's first dental visit, full mouth scaling and fluoride varnish application was performed on the dental chair to access co-operation and the child was categorized under Frankel positive behaviour. During the subsequent visit, local anaesthesia was

administered, rubber dam was placed followed by access opening, pulp extirpation and working length determination. However the patient was uncomfortable with the rubber dam, which hampered the patient's cooperation during the treatment. Hence, it was decided to go ahead with the treatment without the presence of rubber dam. Biomechanical preparation of the canals was done using hand pro taper file (Dentsply Co). The patient was hyper salivating during the entire procedure despite the use of high vacuum evacuators. While shaping the canals with S2 file, the patient jerked and with excess salivation around, the file slipped out of the clinician's hand and was swallowed by the patient. The patient did not show any signs of discomfort. The patient was immediately taken to the hospital, where a postero-anterior abdomen radiograph was taken. Since the patient did not show any immediate signs of aspiration like coughing, dyspnoea, wheezing or choking, aspiration in the present case was ruled out. On radiographic evaluation, the file was located at the level of L4-L5 (Fig. 1). Considering the location of the file, we decided to keep the patient under observation till the file was excreted. The vitals of the patient were monitored and recorded. The patient was asked to consume fibrous diet with inclusion of bananas. The patient's stool was examined the next day morning 20 hours after the incident. However, the file was not excreted. Hence, another postero-anterior abdomen radiograph was taken in order to locate the object. The file was detected to be present below the sacral level. (Fig 2) After 26 hours of the incident, the pro taper file was excreted from the body through the stool. Two weeks later the patient was recalled and the required dental treatment was completed with help of hand pro taper file (Dentsply Co.) with a safety floss attached to it. (Fig 3)

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Fig. 1. PA abdomen view showing File at the L4-L5 level



Fig. 2. PA abdomen showing File at the sacral level



Fig. 3. Safety floss attached to the Hand pro taper file

## DISCUSSION

Dental items have been stated as the second most commonly ingested/aspirated foreign objects in adults (Fields and Schow, 1998; Limper and Prakash, 1990, Tiwana *et al.*, 2004) with ingestion being more frequently reported than aspiration (Obinata *et al.*, 2011). Such accidental ingestion or aspiration may occur in the dental operator (Obinata *et al.*, 2011) or during conscious sedation (Mahesh *et al.*, 2013). The prevalence for ingestion of endodontic instruments was 0.08/100,000 root canal treatments (Susini and Camps, 2007). Only two cases have been reported in the literature on ingestion of pro taper hand file in children, of which one was removed through oesophago-gastroscopy (Bhatnagar *Set al.*, 2011) and another passed through stools after 41 hours (Bondarde *et al.*, 2015). In our case aspiration was ruled out due to the absence of immediate signs of aspiration. If aspiration occurs, it would be characterized by an initial acute phase of coughing paroxysm which would last at least a few minutes which may be followed by a quiescent phase for a week. If the object is not retrieved, it might lead to further complications (Ospina and Ludemann, 2005). The immediate signs of complication phase will comprise of cough with varying severity, dyspnoea, cyanosis, and pain in the chest and late signs would be characterised by cough associated with purulent sputum, haemoptysis and pain in chest (Hedbolm, 1920). In case of ingestion, the factors to be considered depend on the nature and number of ingested foreign body, length and diameter of object, age and general health of patient and time elapsed since ingestion (Henderson *et al.*, 1987). It has been reported that incidence of perforation increased to 15-35 % when a sharp object was ingested (Carp, 1927, Rosch and Classen., 1972). Endoscopic removal is recommended if the object is longer than 5 cm (Yamamoto *et al.*, 1985) with a diameter of greater than 5cm (Christi and Ament., 1976) or the object is not excreted for more than 14 days (Henderson CT *et al.*, 1987). If the object is smaller in size, then observation and waiting for duration of two weeks is advisable because of high chances of the object passing out through stools without any complications (Pavlidis *et al.*, 2006).

In the present case, the endodontic file which the patient swallowed was of 3 cm length and 5mm diameter (Protaper Universal Brochure., 2015). Hence we decided to keep the patient on a diet high in roughage with frequent ingestion of soft food items, like banana and moistened bread which would aid in the passage of the swallowed foreign object (Parolia *et al.*, 2009). Administration of enema and laxative was not advised as it may stimulate forceful intestinal contraction which may drive the object into the intestinal wall (Mac Manus, 1941). If a sharp object gets stuck in the intestinal wall, it might lead to complications like haemorrhage, infection, intestinal obstruction and perforations (Webb, 1988). If intestinal perforation occurs, the presenting symptoms may mimic diarrhoea secondary to fistula, fever, nausea, vomiting, shortness of breath, dizziness, hip pain, etc ((Henderson *et al.*, 1987, Maleki and Evans, 1970). In case of perforation, retrieval of the ingested object endoscopically or surgically from the gastrointestinal system would be the line of treatment (Webb, 1988, Ingestions, 2009). An endodontic hand pro taper file for cleaning of root canals is comparatively superior to an endodontic hand file due to its greater cutting and cleaning efficacy and less instrumentation time (Pinky Kalra *et al.*, 2017). The handle of protaper file does not come with a provision to tie a floss unlike the endodontic hand files. We

incorporated a dental floss into the file handle with the help of suture needle which has not been reported till date. Thus root canal treatment was successfully completed for the patient.

## Conclusion

Accidental ingestion of foreign body during treatment is distressing for the patient, parent and the clinician. Dentists should have adequate knowledge of signs and symptoms of aspiration or ingestion of foreign body and the appropriate management protocols.

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