

Accidental swallowing of endodontic instrument: Could be a medical emergency

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ABSTRACT

Accidents are unpleasant incidences that happen when we are careless or when we do not follow the safety rules. In the dental office, foreign body ingestion or aspiration is a rare but serious mishappening. Ingestion of blunt foreign objects is less life-threatening and the object is generally egested through the gastrointestinal tract uneventfully, but sharp objects like endodontic files may sometimes cause intestinal perforation. Aspiration, on the other hand, is a more serious, but fortunately, less prevalent hazard and often leads to hospitalization of the patient. From a legal aspect also, such incidence is counted as negligence on the part of the operator and the dentist should be well aware of the legal liabilities and should take the appropriate preventive measures to prevent or intercept any untoward circumstance.

Key words

Aspiration, ingestion, rubber-dam

INTRODUCTION

Accidents are unpleasant incidences that happen when we are careless or when we do not follow the safety rules. In the dental office, foreign body ingestion or aspiration is a rare but serious mishappening. It is encountered mostly in children (approximately 73-80% of cases) but may also happen to adults, especially if the patient is having psychiatric problems, mental retardation or altered consciousness due to some sedation.^[1] Small prostheses like inlays/onlays, single unit crowns during cementation, orthodontic brackets, rubber dam retainers, endodontic instruments, teeth, cotton/gauge, mirror heads or even tooth brushes are the objects that have been reported to be ingested.^[2,3]

Ingestion of blunt foreign objects is less life-threatening and the object is generally egested through the

gastrointestinal (GI) tract uneventfully, but sharp objects like endodontic files may sometimes cause intestinal perforation. Aspiration, on the other hand, is a more serious, but fortunately, less prevalent hazard and often leads to hospitalization of the patient. Grossman determined that chances of foreign body entering the digestive system was 87% and entered respiratory tract was 13%.^[4] According to studies on large populations, the incidence of ingestion and aspiration is reported to be about 0.004% and aspiration was more common than ingestion.^[5,6] In a hospital-based retrospective study by Obinata *et al.*,^[7] the authors reported 23 cases of such accidents in a period of 5 years. In 8 of these cases, metal inlay/onlay was being cemented while 3 of the patients were undergoing root canal treatment. Reports from two French insurance companies over a period of 11 years indicate that the ration occurrence of these cases/dentist was approximately 0.021/year.^[8]

While 10-20% of such cases can be managed nonsurgically, around 1% cases may require surgical intervention. In the case of any such incidence, the operating dentist should maintain airway patency and immediately seek medical care for the patient.^[9] From a legal aspect also, such incidence is counted as negligence on the part of the operator and the dentist should be well aware of the legal liabilities and should take the appropriate preventive measures to prevent or intercept any untoward circumstance.^[10] The present

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paper discusses accidental ingestion of a stainless steel postdrill by a young female patient, which eventually passed uneventfully through her digestive tract after 3 days.

CASE REPORT

A 20-year-old, systemically healthy, female patient reported to the Department of Endodontics with the chief complaint of fractured anterior tooth. Dental history and intra-oral periapical X-rays showed an endodontically treated maxillary right central incisor.^[11] As the coronal tooth structure was severely broken down, post and core restoration was planned. Rubber dam application was tried but was not possible due to inadequate grip on the remaining fragile dental hard tissues. The canal was being prepared to receive a fiber post with a postdrill when suddenly, the drill got unattached from the latch of the micromotor handpiece and fell on the patient's floor of the mouth and was swallowed by the patient. The patient was immediately seated in an upright position and asked to cough vigorously. As there were no signs and symptoms of airway obstruction or breathlessness, it appeared that the instrument had entered her digestive tract. Erect abdominal posteroanterior view radiograph was taken, and a radio opaque object was located at the level of her intestine [Figure 1]. The patient was given high roughage diet and bananas to ease the passage of an object in her digestive tract. As there were no symptoms like pain or shortening of breath, the patient was discharged with the instructions to have high fiber diet and monitoring of the stools and was recalled the next morning. Another radiograph was taken the next day, and the instrument could still be seen in the digestive tract [Figure 2]. The patient was otherwise asymptomatic and did not report any abdominal pain or blood in the stools. Repeat radiograph on the 3rd day of the accident showed clearance of the instrument from the GI tract [Figure 3]. The patient was not aware of the instrument passing through her stools. Endoscopy was performed to rule out any intestinal perforations and patient was put on active followup to evaluate for any adverse signs or symptoms. She reported healthy and asymptomatic at her 6 months recall visit.

DISCUSSION

Ingestion or aspiration of dental instruments or appliances may occur even after dental treatment, like ingestion of a partial removable or fixed prosthesis or orthodontic appliance such as broken molar bands.^[11] Ingestion/aspiration are potentially dangerous and carry the risk of causing life-threatening or serious complications as choking, esophageal tissue perforation, intestinal ulceration/puncture, bronchial stenosis, abscess formation, hemorrhage or fistula.^[12] Patients having compromised motor functions, psychosis, Alzheimer's or Parkinson's disease, mental retardation, excessive gag



Figure 1: Day 1 abdominal radiograph showing postdrill in the intestine



Figure 2: Second day radiograph showing instrument still in the digestive tract



Figure 3: Third day radiograph showing no sign of instrument in the digestive tract

reflex/restless nature, or who have undergone surgery of the oral cavity, oropharynx are more prone to such accidents. Aspiration demands immediate care as it

may lead to inflammation, respiratory obstruction and even death.^[13] Signs of labored breathing and respiratory stress indicate airway obstruction, and coughing should be induced or Hemlich's procedure should be performed to propel the object out. If the object is still not retrieved, patient is shifted to the medical emergency, where an emergency team may perform cricothyroidectomy to relieve the blocked airway.^[14] Chest and abdominal X-rays assist in determining the location of the lost object. Certain radiolucent objects such as acrylic teeth, resin fillings or impression materials need bronchoscopy or computed tomography. The aspirated object mostly enters the right bronchial tree as it is wider and is more vertically positioned and require surgical intervention for their removal.^[15,16]

Immediate medical attention is required even if there are no signs of respiratory distress and patient seems asymptomatic after swallowing/ingestion of object, like in the present case. The patient may complain of something stuck in the throat and present with excessive salivation and gagging. If the instrument is large and long enough and is visible at the oropharyngeal level, it may carefully be retrieved with forceps or fingers, without pushing it further in the digestive tract. Foley catheter is a simple way of recovering small, blunt objects. If one attempt is unsuccessful, the object may be pushed into the stomach with the help of bougienage so that it can be egested from the digestive tract later.^[1] Endoscopy is required when the object is sharp, nonradiopaque, long or multiple instruments are swallowed. Earlier literature indicates that if an object crosses the stomach, there are 90% chances of it being passed through the digestive tract uneventfully within 7 days of the accident.^[17] In the case the position of the instrument doesn't appear to change in the lower abdomen, then colonoscopy through rectum and a laparoscopic examination to locate the object and subsequent removal by ileotomy, colonotomy or appendectomy may be necessary. The passage of the object through the tract is slow and difficult in patient having reduced peristaltic movements, e.g. in Crohn's disease.^[18] Serial radiographs are a reliable method of monitoring the passage of the object, and also about any indication about intestinal perforation.^[19] Furthermore, patient and the guardians should look for signs such as blood in stools, or symptoms such as cramps, fever or chills, which are suggestive of peritonitis due to intestinal perforation and may require surgical intervention.^[10,20]

CONCLUSION

The age-old maxim "prevention is better than cure" holds true for all accidents. Application of rubber dam, gauge barriers, floss/thread tied to clamps, files, checking of proper locking of instruments in headpieces are some of simple measures, that can prevent these mishappenings. Also, operator should take proper medical history, especially about motor-neural disorders, psychological status or any medication

that causes sedation of central nervous system and suppression or reduction of reflexes.

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