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Emergency management of a dental foreign body ingestion using rigid esophagoscopy – A clinical case report



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ABSTRACT

Ingestion of a foreign object is a common problem and is managed by otolaryngologists efficiently depending on its location, size of the object and patient's systemic condition. In dental literature foreign body aspiration or ingestion is often experienced and documented in regard to partial dentures, indirect restorations, endodontic files and retainers. This is encountered majorly due to improper isolation techniques, crown cementing failures, operator's negligence and patient's maintenance errors.

In this case report we present an unusual procedural occurrence where a dental patient swallowed the loosened cartridge of a high speed hand airotor with a bur attached to it during access opening performed by a general practitioner with independent practice. The patient was immediately referred To Panineeya Institute of Dental Sciences, Hyderabad and was tackled by a team of doctors taking in to concern the patient's vitals and clinical symptoms. The localization of the object was confirmed to be in cricopharynx by radiographical assessment and is successfully retrieved through multidisciplinary approach in a speciality medical hospital by rigid esophagoscopy under general anaesthesia following which the post operative care was rendered and patient's follow up was done. The unusuality of this case concerns to the type of foreign body, shape, location and to our knowledge is one of the rare cases of this type reported in dental literature.

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1. Introduction

Accidental ingestion of foreign objects is often seen in pediatric patients and in adults with neuromuscular and psychiatric disorders.[1] In majority of the patients the foreign object traverses the gastrointestinal system but often gets impacted in the constrictions of oesophagus ie, cricopharyngeal region of hypopharynx depending on the motility patterns and size of the object.[2,] The object warrants immediate removal as the long term retention leads to complications like dysphagia, airway obstruction, perforation, mediastinitis etc and often mortality.[3,4] Accurate localization of the object and surgical intervention along with endoscopy is required in 12%–16% of the cases for prompt removal of the object.[5,6]

In restorative dentistry, ingestion or aspiration of foreign bodies is experienced with accidental engulfment of inlays, onlays, crowns, endodontic files, restorative debris etc. This

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occurs due to failure in proper isolation of the operating field. Cumulative usage of rubber dam and high-volume evacuator is a recommended isolation technique in preventing the patient from harm of accidental swallowing during operation.

2. Case report

A 40-year-old male visited a general practitioner with independent practice for endodontic treatment in lower right back tooth region. The patient was scheduled for treatment and was set forth without the regular rubber dam isolation. During the procedure, the cartridge head of the operating high speed airotor loosened and collapsed in to the oral cavity and was accidentally swallowed by the patient. The promptly alarmed practitioner called the treatment procedure to a halt and the proximity of dental chair was checked and cartridge slippage on to the floor was ruled out. The patient was immediately referred to the post graduate wing of Department of Conservative Dentistry and Endodontics, Panineeya Institute of Dental Sciences located close to the clinician's office.

The patient's clinical symptoms were noted and an initial X-ray was taken to determine the localization of object. Clinically the patient presented with mild discomfort during swallowing but showed normal breathing pattern and was stable. The initial X-ray confirmed the presence of a radiopaque object in the throat. The patient was disclosed about the operative mishap and was assured to be taken of. Taking his consent, the patient was shifted to a multidisciplinary medical hospital located in the closest vicinity.

The patients oxygen saturation was checked and it was in between 90% and 95%. The routine blood tests were performed and were in normal limits. An antero-posterior (Fig. 1) and a lateral view (Fig. 2) chest X-rays were taken and they revealed a radiopaque ingested foreign body in the cricopharynx. The lateral X-ray unveiled prevertebral widening in the region of C6–C7 (Fig. 2).

Patient was then transferred to ENT outpatient wing of the hospital. Clinical examination was repeated and taking the patient's vitals in to consideration a rigid esophagoscopy approach under general aneasthesia was planned and executed. The esophagoscope used was non-pneumatic and was paired with light carriers for better visibility of the operating site. An overtube was used to prevent lacerations to the pharyngeal mucosa and graspers were utilized to retract the foreign object. The post operative X-ray taken confirmed the unmutilated and total removal of the object (Fig. 3). The length of the retrieved cartridge head of airotor with bur attached is noted as 23 mm (2.3 cm) as measured with a metal ruler (Fig. 4).

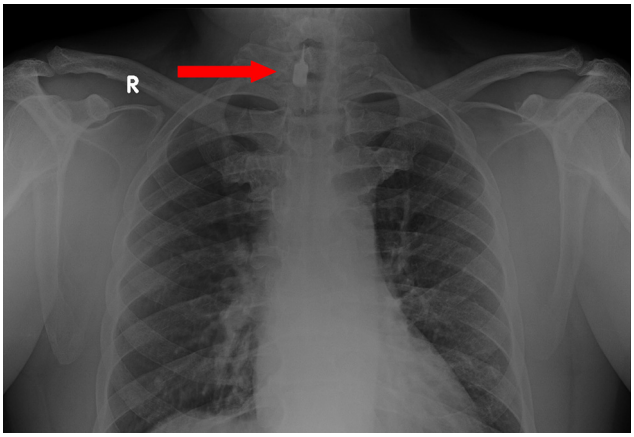


Fig. 1 – Pre-operative antero-posterior X ray of the chest with an arrow depicting the presence of radiopaque object (cartridge head of airotor with bur attached) impacted vertically with penetrating tip pointing upwards and superior to the sternum.

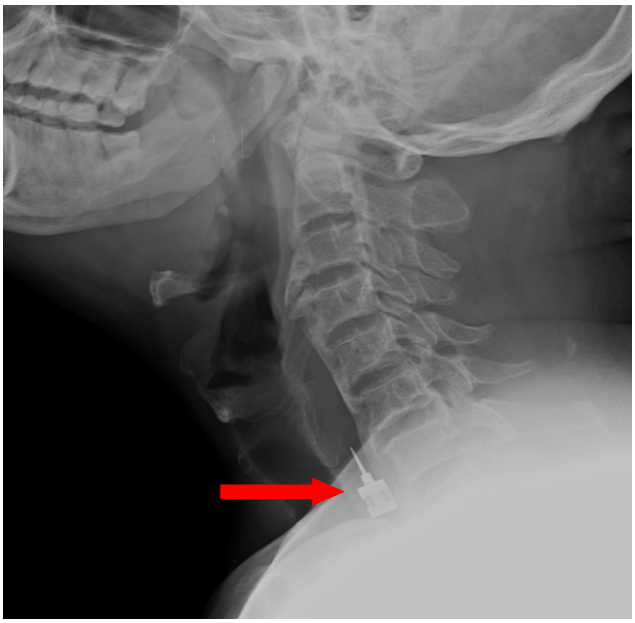


Fig. 2 – Pre-operative lateral X-ray view with an arrow depicting the presence of radiopaque object (cartridge head of airotor with bur attached) impacted in the region of cricopharynx at the cervical vertebral level of C6–C7. The prevertebral widening at C6–C7 is observed.

The patient was kept on routine intravenous antibiotics to prevent secondary infections and steroids to prevent inflammation and pain for 3 days. As patient presented with mild dysphagia, he was kept on liquid diet for 2 days followed by semisolids and normal diet. The patient was discharged on 3rd day postoperatively being totally asymptomatic.

3. Discussion

Foreign body ingestion and food bolus impaction is a frequently seen occurrence. Pre endoscopic series revealed that surgical intervention can be avoided in 80% of the cases as the object passes spontaneously in to the gastrointestinal tract.[7,8] While the endoscopic intervention is higher (63%–76%) and surgical intervention accounts for 12%–16%.[5,6]

The most commonly ingested objects are bone, nuts, coins, toys, capsules[9] whereas in dental patients the accidental ingestion of artificial dentures in elderly and restorative instruments and debris is periodically noted.[4]

A documentation of accidentally ingested foreign objects during dental procedures in Center for Dental clinics in

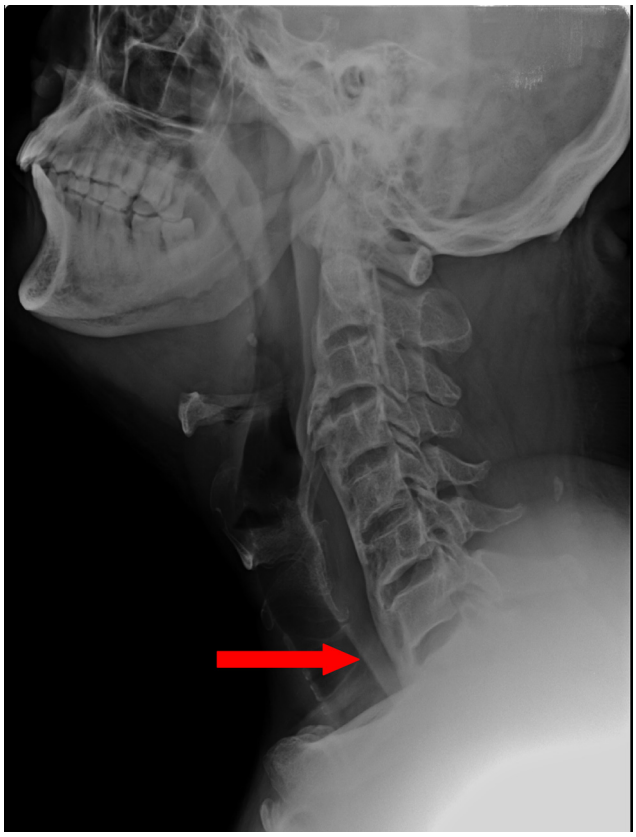


Fig. 3 – Post-operative lateral view X-ray with an arrow depicting the complete and unmutilated removal of the radiopaque object (cartridge head of airotor with bur attached) from the cricopharyngeal region. The absence of prevertebral widening at C6–C7 is noted.

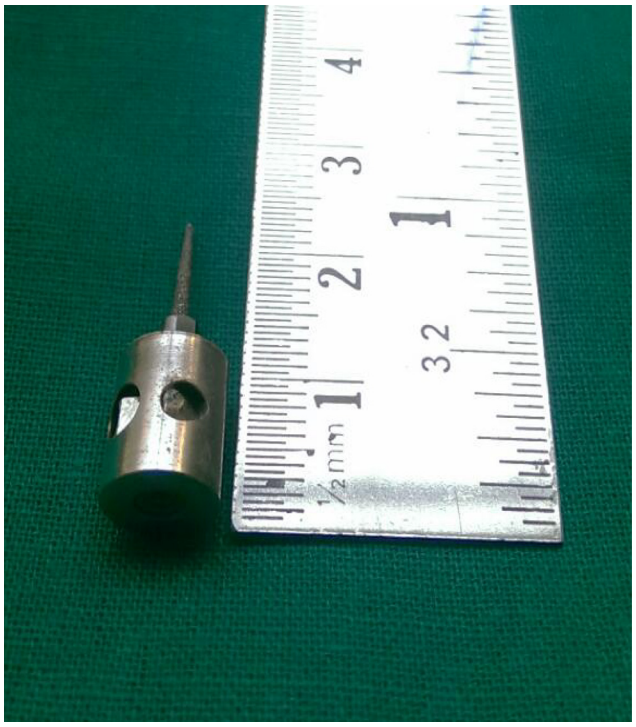


Fig. 4 – The measurement of the retrieved cartridge head of airotor with bur attached is noted as 2.3 cm or 23 mm measured along a metal scale.

Hokkaido University for a span of 4 years (2006–2010) presented 23 cases out of which 5 cases displayed patients with neurological symptoms (Fig. 5).[10]

Failure in isolation during treatment leads to accidental ingestion of armamentarium used. Rubber dam isolation is considered as the best mode of isolation summating the other advantages of improved visibility and ease of workmanship. In patients allergic to latex (the ingredient on rubber dam sheet) and patients with chronic respiratory conditions like status asthmaticus and COPD, throat screens are used during try in and removal of indirect restorations like inlays and onlays. Armamentarium like rubber dam retainers and files can be safely retained by tieing a dental floss of favourable length (preferably 12 inches) to ward off accidental ingestion.

To intercept in clinic accidental ingestion or aspiration of foreign objects, the dental armamentarium like the airotor has to be manually checked regularly to examine its quality and functional condition. In the present scenario, the airotor used was earlier malfunctioning and returned from the repair but was failed to be rechecked before the operative procedure by the dental assistant. A thorough scrutinization of the airotor's condition would have prevented the mishap.

Swallowing test (pain on drinking water) and tracheal rock (moving of trachea side to side) suggests the presence of

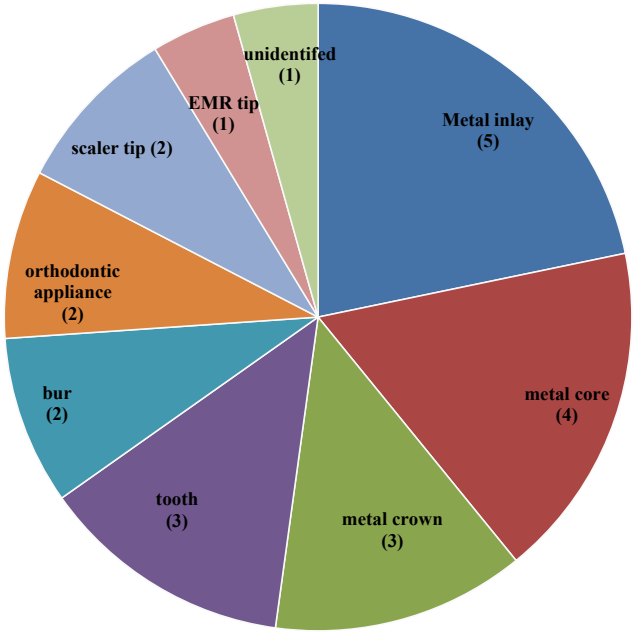


Fig. 5 – A pie chart depicting the accidental ingestion of foreign objects during dental procedures documented between 2006 and 2010 in the center for dental clinics of Hokkaido university hospital, Japan. Objects accidentally ingested (courtesy: kenichi obinata et al 2011)

foreign body in oesophagus.[11] These tests exclude the possibility of aspiration of foreign object in to the respiratory system and helps in clinical distinguishing of the object impaction site. Clinically the cervical oesophageal foreign body impaction may lead to airway obstruction, violent cough, chest pressure, dysphagia, and odynophagia.[12] Long term retention of object leads to oesophageal mucosal inflammation, perforations, retropharyngeal abscess, mediastinitis, pleural emphysema and fistulization.[13]

Foreign objects tend to get impacted at the level of cervical oesophagus due to its natural constrictions.[3] The 3 anatomical constrictions are crico pharyngeal ring, aortic arch narrowing which extends to almost 13–15 cm and oesophago gastric junction.[14] Age also influences the position of object in oesophagus as in adults the lower third is the main impaction site.[4]

The diagnosis of foreign body in upper aerodigestive tract is crucial and is done by radiological assessment. Multiple views are required to assess the location and size of the object.[15] Radioisotope tracing using barium can be done in non radiopaque foreign objects but this procedure is outdated and is not used currently.[3,4] CT scan can also be used to localize and assess the size of object and its proximity to anatomical structures.[4,14] As the foreign body in our case report was radiopaque and the size assessment was noted, no additional radiographical modality was chosen.

The management of foreign body retrieval is a multidisciplinary approach that includes the team work of radiologist, anaesthetist, otolaryngologist and thoracic surgeon if necessary. The type of endoscopy depends on the site of operation and size, shape, type, number of foreign objects lodged.[15] In our case report, as the foreign object is lodged in proximal oesophagus, with more than 4 cm size and is penetrating, usage of flexible endoscope is compromised and rigid endoscopy was preferred. Studies have shown that usage of endoscopy in foreign body retrieval showed 83% success.[15]

Endoscopy/esophagoscopy can be performed under general anaesthesia and conscious sedation depending on the foreign body impaction site and patients medical conditions taken in to concern. The common post endoscopy complications are hoarseness in voice, dysphagia, wounds and perforations that occur due to instrumental manoeuvres.

In the current case report, post operative discomfort and infection is eluded by prescribing antibiotics and steroids to reduce inflammation. Diet management with liquids and semisolid food was recommended for the speedy healing of the discomfort or manoeural wounds. Patient was completely notified about the esophagoscopy side effects and followed for a period of 15–30 days till the symptoms subsided.

4. Conclusion

To do no harm or non maleficence is the primary goal of a clinician. In dental practice prevention of foreign object ingestion or aspiration is to be given paramount significance. This demands the alertness and caution of the clinician and the dental assistant in ensuring proper isolation methods with summative concern to the patients medical history. The peculiarity of this case accounts for the type of foreign body, location of its impaction and the immediate management of the emergency that ceased further impediments and led to a positive outcome of the treatment.

Conflicts of interest

All authors have none to declare.

REFERENCES

1. Webb WA. Management of foreign bodies of the upper gastrointestinal tract: update. *Gastrointest Endosc.* 1995;41:39–50.
2. Birchell MA, Croft CB, Hibbert J. *Scott Brown's Otolaryngology, Examination and Endoscopy of the Upper Aerodigestive Tract.* Great Britian: Butterworth-Heinemann; 1997, 5/1/1–5/1/14.
3. Al-Qudah A, Daradkeh S, Abu-Khalaf M. Esophageal foreign bodies. *Eur J Cardio-Thoracic Surg.* 1998;13:494–499.
4. Akazawa Y, Watanabe S, Nobukiyo S, et al. The management of possible fishbone ingestion. *Auris Nasus Larynx.* 2004;31:413–416.
5. Palta R, Sahota A, Bemarki A, et al. Foreign-body ingestion: characteristics and outcomes in a lower socioeconomic population with predominantly intentional ingestion. *Gastrointest Endosc.* 2009;69:426–433.
6. Weiland ST, Schurr MJ. Conservative management of ingested foreign bodies. *J Gastrointest Surg.* 2002;6:496–500.
7. Carp L. Foreign bodies in the intestine. *Ann Surg.* 1927;85:575–591.
8. Pellerin D, Fortier-Beaulieu M, Gueguen J. The fate of swallowed foreign bodies experience of 1250 instances of subdiaphragmatic foreign bodies in children. *Progr Pediatr Radiol.* 1969;2:286–302.
9. Cangir AK, Tug T, Okten I. An unusual foreign body in the esophagus: report of a case. *Surg Today.* 2002;32:523–524.
10. Obinata Kenichi, Satoh Takafumi, Mohammad Towfik Alam, et al. An investigation of accidental ingestion during dental procedures. *J Oral Sci.* 2011;53:495–595.
11. Al-Qudah A, Daradkeh S, Abu-Khalaf M. Esophageal foreign bodies. *Eur J Cardio-Thoracic Surg.* 1998;13:494–499.
12. Athanassiadi K, Gerazounis M, Metaxas E, Kalantzi N. Management of esophageal foreign bodies: a retrospective review of 400 cases. *Eur J Cardio-Thoracic Surg.* 2002;21:653–656.
13. Karaman A, Cavusoglu YH, Karaman I, Erdogan D, Aslan MK, Cakmak O. Magill forceps technique for removal of safety pins in upper esophagus: a preliminary report. *Int J Pediatr Otorhinolaryngol.* 2004;68:1189–1191.
14. Von Rahden BHA, Feith M, Dittler H-J, Stein HJ. Cervical esophageal perforation with severe mediastinitis due to an impacted dental prosthesis. *Dis Esophagus.* 2002;15:340–344.
15. Furihata M, Tagaya N, Furihata T, Kubota K. Laparoscopic removal of an intragastric foreign body with endoscopic assistance. *Surg Laparosc Endosc Percutan Tech.* 2004;14:234–237.