

SIMULTANEOUS TRACHEOESOPHAGEAL MAGNET FOREIGN BODIES: A UNIQUE CASE REPORT IN A CHILD

SAMI M. IBRAHIM², ABDELHADY SAMAHA¹, SAMI CHERIGUI¹,
MANSOUR ALI¹ AND SALEEM MAMOO³, ASHRAF ABDELHAMID⁴

Abstract

We report a case of a 1-year old child found to have multiple magnetic foreign bodies lodged simultaneously in the esophagus and the trachea. To our knowledge, this is the first report of a double localization of magnetic FBs in the aerodigestive tract in children.

Ingestion and aspiration of foreign bodies is a common problem in children, but their simultaneous aerodigestive localization is rare. Ingestion of multiple magnetic FBs can be associated with serious complications. We recommend early endoscopic removal to avoid perforation and formation of tracheoesophageal fistula.

Keywords: Foreign body, Magnet ingestion, aspiration, child.

Introduction

Foreign body ingestion and aspiration is common in the pediatric age group. Most ingested foreign bodies pass spontaneously through the gastrointestinal tract without causing problems. However, multiple magnetic foreign bodies can cause serious complications^{1,2}.

We report a unique case of a child found to have multiple magnetic foreign bodies lodged simultaneously in the esophagus and the trachea.

Case Report

A 1-year old boy weighing 10 kg presented to the accident and emergency department complaining of a 3 day history of repeated cough. The mother had some doubt about the ingestion of a foreign body (FB) by her child and reported also that his sister, developed simultaneously, cough and signs of respiratory infection.

On examination, the child had mild fever (37.7°C), repeated cough, wheezy chest and minimal crepitation. He was not in distress and his oxygen saturation was 94% on room air. His abdomen was soft, lax and non-tender.

The chest radiograph showed a transverse radio opaque shadow in the posterior upper part of the chest at the level of the third thoracic vertebra, suggestive of 3 foreign bodies (Fig. 1). The

1 Consultant Department of Paediatric Surgery, Hamad General Hospital, Doha, Qatar.

2 Consultant Department of Anesthesia, Hamad General Hospital, Doha, Qatar.

3 Consultant and head of Department of Paediatric Surgery, Hamad General Hospital, Doha, Qatar.

4 Specialis tDepartment of Paediatric Surgery, Hamad General Hospital, Doha, Qatar

Corresponding Author: Dr. Sami M.I. Abdelmaksoud. M. Sc, MD, DHPE, FIPP Diploma of Regional Anesthesia and Analgesia (Montpellier, France) Diploma of Intervention Pain management (Montpellier, France) Assistant Professor of Anesthesia & ICU, Zagazig University, Egypt. Assistant professor of clinical anesthesia, WCMC - Q Anesthesia consultant, HMC, Doha, Qatar. 0097455621409.

Fig. 1
chest radiograph showing 3 opaque images
suggestive of foreign bodies.

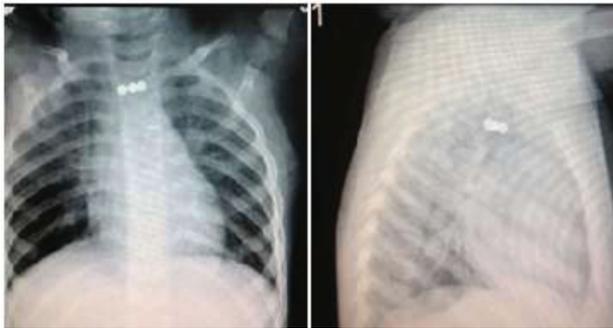
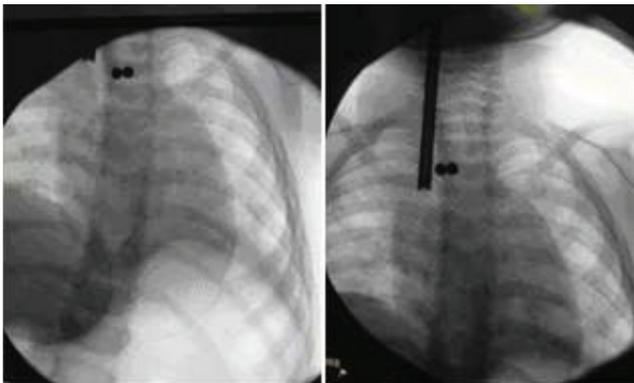


Fig. 2
chest radiograph showing the 2 remaining FBs medial and
posterior to the bronchoscope, suggestive of their esophageal
position.



exact localization of the FBs, in the trachea or in the esophagus, could not be confirmed by the simple chest X-ray.

The child was taken rapidly to the operating theatre for endoscopic removal of the FBs. He received a pre-oxygenation and intravenous sedation using fentanyl 1mcg/kg, propofol 0.75mg/kg. Then, lidocaine 2% was given to spray the oral cavity and the laryngeal inlet.

An initial examination using a flexible fiber optic endoscope was done to explore the trachea and bronchial tree before any rigid bronchoscopy. This initial exploration showed a small round metallic foreign body imbedded in the posterior lateral wall of the trachea, which was then removed easily using a rigid bronchoscope. This metallic object was found to have a magnetic structure.

A new chest radiograph was done after reinsertion

of the rigid bronchoscope to check the position of the other 2 pieces. It showed that the other FBs were situated posterior and medial to the bronchoscope, indicating their esophageal position (Fig. 2).

The child was then intubated with a 4fr endotracheal tube to secure the airways and a rigid esophagoscopy was done. The 2 remaining pieces were easily removed, attached to each other, from the mid part of the esophagus. A final chest and abdomen radiograph was done to confirm the clearance of the trachea and the digestive tract.

The 3 pieces have a magnetic structure and a strong attraction force (Fig. 3).

The patient was shifted to the surgical ward after extubation for complete recovery. He was discharged from the hospital after 2 days. He was tolerating full oral feeding and symptom free.

Fig. 3
The 3 FBs have a magnetic structure and
a strong attraction force.



Discussion

Aspiration and ingestion of foreign bodies in children continues to increase and represents a common health problem in the pediatric population³. More than

half of FB injuries in the aerodigestive tract affect children younger than 4 years³. This can be explained by the fact that chewing and swallowing become more coordinated around the age of 5 years. The ingestion of only one magnet does not represent a problem, but when ingested in multiples, magnets become harmful⁴ and may cause complications requiring surgical intervention. The vast majority of foreign bodies reaching the stomach pass through the gastrointestinal tract spontaneously. Tracheal and esophageal foreign bodies are typically retrieved via endoscopy⁵.

The types of foreign bodies lodged in the aerodigestive tract differ according to feeding habits, culture and social life⁶. The most frequent FBs in children are coins, pins, toys, food pieces, nuts and seeds. Coins are the most common FBs in the digestive tract, whereas seeds are the most frequently detected FBs in the respiratory tract³. Button batteries and toy magnets are associated with high risk complications. When multiple magnets are ingested and/or aspirated, they may attract each other through the intestinal wall or the tracheoesophageal wall, causing pressure necrosis, perforation or fistula formation⁴. Fifteen cases of digestive complications, secondary to magnet ingestion, have been reported in the literature till 2009². The case we report in this paper is the unique case described of simultaneous localization of magnet foreign bodies in the trachea and the esophagus of a child. A systematic review of the literature through PubMed did not find any similar description.

The symptoms of foreign bodies in the upper aerodigestive tract vary from an asymptomatic state to respiratory distress, coughing, dysphonia, vomiting and dysphagia depending on the localization and the size of the FB and the age of the child³. A large percentage of patients are asymptomatic and more than 50% of the children had history of aspiration or ingestion.

Aspiration or ingestion of a foreign body can be easily misdiagnosed, particularly if a history of choking or coughing is not reported, or if the accident was not witnessed by family members. Delay in diagnosis concerns mainly children younger than 2 years and may increase the risk of serious complications in both digestive and respiratory tract^{3,4}.

The diagnosis of lodged FBs in the upper

aerodigestive tract relies mainly on clinical history, physical examination and radiography. Endoscopy is usually performed for both diagnosis and treatment. More than 80% of these FBs are diagnosed and removed in the first 24 hours³.

The chest radiograph should be always requested. It may provide clues to the diagnosis, but a normal radiograph does not exclude a FB aspiration or ingestion. Radio-opaque FBs are easily recognized and usually localized in the upper esophagus, trachea or right main bronchus³. In our case the magnets were attached to each other forming a transverse rod in the upper chest. It was difficult to determine accurately whether the 3 pieces were in the esophagus or in the trachea, but their horizontal disposition was highly suspicious of a double localization in the digestive and respiratory tract.

Foreign body management differs according to localization. Magnets localized in the esophagus, the stomach or the respiratory tract, are usually removed endoscopically^{2,5,7}. This endoscopic intervention should be early, as soon as possible, if ingestion or aspiration of more than one magnet is suspected². In fact, there are no reports were more than one magnet was passed spontaneously². On the other hand, delay in intervention would lead to serious complications. The attracted magnets may result in pressure necrosis, between two loops of intestine or between the trachea and the esophagus, and end by perforation or fistula^{2,4,5}. Hammond et al have reported a case of tracheoesophageal fistula secondary to ingestion of a disk battery⁸. In our case, we guess that misdiagnosis or delay in management would have lead to erosion of the mucosa, perforation or formation of a tracheoesophageal fistula with all its inherent complications; although similar cases, secondary to magnet FB, have never been reported.

In the case of a suspected double localization of magnet FBs, we recommend to start by exploring the respiratory tract to secure the airways. Most authors consider rigid endoscopy to be the standard technique for extraction of FBs in the aerodigestive tract of children, and the success rate is greater than 97%^{3,7,9}. However, in doubtful cases, we think that a fiber optic flexible bronchoscope is a fast and less traumatic tool to confirm the presence of FBs in the respiratory

tract and to evaluate the degree of obstruction before their removal using a rigid bronchoscope. A rigid esophagoscope will easily remove the FBs located in the esophagus in most of the cases¹⁰.

Conclusion

Ingestion of magnet foreign bodies is still rare

References

1. UCHIDA K, OTAKE K, IWATA T, ET AL: Ingestion of multiple magnets: hazardous foreign bodies for children. *Pediatr Radiol*; 36:263-264, 2006.
2. SAEED A, JOHAL NS, ASLAM A, ET AL: Attraction problems following magnet ingestion. *Ann R Coll Surg Engl*; 91:1-3, 2009.
3. CEVIK M, GOKDEMIR MT, BOLEKEN ME, ET AL: The characteristics and outcomes of foreign body ingestion and aspiration in children due to lodged foreign body in the aerodigestive tract. *Pediatr Emerg Care*; 29:53-57, 2013.
4. ANSEMI EH, SAN ROMAN CG, FONTOBA JEB, ET AL: Intestinal perforation caused by magnetic toys. *J Pediatr Surg*; 42:E13-E16, 2007.
5. BUTTERWORTH J, FELTIS B: Toy magnet ingestion in children: revising the algorithm. *J Pediatr Surg*; 42:E3-E5, 2007.
6. YALCIN S, KARNAK I, CIFTCI AO, ET AL: Foreign body ingestion in children: an analysis of pediatric surgical practice. *Pediatr Surg Int*; 23:755-761, 2007.
7. ONCEL M, SUNAM GS, CERAN S: Tracheobronchial aspiration of foreign bodies and rigid bronchoscopy in children: *Pediatr Int*; 54(4):532-535, 2012.
8. HAMMOND P, JAFFRAY B, HAMILTON L: Tracheoesophageal fistula secondary to disk battery ingestion: a case report of gastric interposition and tracheal patch. *J Pediatr Surg*; 42:E39-E41, 2007.
9. PAN H, LU Y, SHI L, PAN X, LI L, WU Z: Similarities and differences in aspirated tracheobronchial foreign bodies in patients under the age of 3 years: *Int J Pediatr Otorhinolaryngol*; 76(6):911-914, 2012.
10. TOKAR B, CEVIK AA, ILHAN H: Ingested gastrointestinal foreign bodies: predisposing factors for complications in children having surgical or endoscopic removal. *Pediatr Surg Int*; 23:135-139, 2007.

but its incidence is increasing. Simultaneous ingestion and aspiration of magnets have never been described before. Our report shows that this is a possible event and should alert caregivers. Multiple magnet ingestion is a serious accident and needs to be managed as early as possible. Delay in treatment can result in serious problems, possibly leading to perforation and formation of a tracheoesophageal fistula.