

Case Report

Sheer negligence turned into nightmare for a child: a case report of multiple magnetic foreign bodies intake

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Received: 27 October 2024

Accepted: 05 December 2024

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ABSTRACT

Foreign body ingestion is one of the most common pediatric emergencies. The ubiquity of toys containing magnetic elements lead to an increase in such incidences. While most ingested foreign bodies, including a single magnet and will spontaneously pass out of the gastrointestinal tract, some may give rise to grave and potentially life-threatening complications which is often seen in the presence of 2 or more magnets or paramagnetic material. The diagnosis of ingestion of magnetic foreign bodies remains a challenge, given its often ambiguous history and presentation. Here we present one such case of multiple metallic foreign bodies intake gone unnoticed by the parents which brought nightmare for the 5-year-old child and for the surgery team due to on table decisions being taken. Unlike most cases of foreign body ingestion, the presence of magnetic and paramagnetic elements imposes the risk of serious injury to the gastrointestinal tract. While history and clinical presentation are often ambiguous, it is paramount that physicians carefully investigate the patient; a simple plain abdominal radiograph may suffice in revealing any dense foreign bodies of metallic densities. The ingestion of multiple magnets presents a unique situation in which foreign objects are not able to pass with normal motility due to tethering between loops of bowel, which may become ischemic and perforate. We recommend early surgical intervention before gastrointestinal complications develop. Toy companies, parents and physicians should be warned of potentially fatal outcome of ingesting these 'nicely made' toys.

Keywords: Magnet, Ingestion, DJ flexure, IC junction, Children, Toys

INTRODUCTION

Foreign body (FB) ingestion is common in children, and most foreign bodies pass spontaneously without causing serious injuries.^{1,2} Most cases seen are between the ages of 6 months and 3 years; however, there have been instances reported in children older than 3 years of age.³ Older children may swallow such objects, particularly if suffering a behavioral or mental problem.¹ In contrast to commonly ingested complicated FBs, such as batteries or sharp objects, reports of ingestion of small magnet pieces are relatively recent.¹⁻⁴ Ingestion of multiple magnet pieces is peculiar, and since the first report of Neodymium magnet ingestion causing serious bowel injuries in 2002,

the incidence of magnet ingestion has been increasing.⁴⁻⁸ Although conservative treatment is sufficient in most cases of FB ingestion, ingested FBs can cause serious morbidity or mortality depending on their size, their shape, and the patient's medical status; therefore, endoscopic or surgical intervention is occasionally required.³

In cases involving magnet ingestion, however, clinicians often face challenges in diagnosis and management if doubt exists regarding how many magnets were ingested and whether an ingested FB is magnetic or metallic, given that clear differentiation between these two types of FBs is not always possible. Here we are presenting one such case report.

CASE REPORT

A 5-year-old male child was brought to our emergency as a case of fever with pain abdomen and abdominal distension since 2 days. On examination following were the findings: toxic look with irritable child, tachycardia with feeble pulse (BP=70/50 mm Hg and pulse 160-180/minute), and distended abdomen with tympanic note.

He was resuscitated and routine investigations showed total leucocyte count (TLC) of 2500 and C-reactive protein (CRP) of 256. X ray thoracoabdominal view was done in view of suspicious of perforation peritonitis which showed gross air under diaphragm and an opaque linear object in pelvic region (Figure 1).



Figure 1: X-ray showing gross air under diaphragm with foreign body.

Without any delay patient was taken for emergency laparotomy and using the midline laparotomy incision, following findings were noted: gush of air followed by 1 litre of faecopurulent material; multiple button hole perforations including 1 feet from duodojejunal (DJ) flexure, ileocaecal (IC) junction, 1 feet from IC junction, and 3 feet from IC junction (3 perforations along transverse line); foreign body with 9 joined magnets with approximate size of 1×1 cm; and multiple enlarged lymph nodes (Figure 2).



Figure 2: Clockwise from top, findings mentioned in points 2, 3 and 4.

Management was done by: thorough lavage with warm saline was given; perforation 1 feet from DJ flexure was repaired with double layered (internal continuous full thickness vycryl 3-0 and outer interrupted silk 3-0 seromuscular) to prevent short bowel syndrome; perforations at IC junction and 1 feet proximal to IC junction were also repaired in similar fashion; perforations 3 feet proximal to IC junction were fashioned out as stoma in view of repair at high pressure zone of IC junction and also due to severe septicemia (after taking due consent from the parents); and lymph node biopsy was taken to rule out any other associated pathology (most common is tuberculosis in India) (Figure 3).



Figure 3: On completion of procedure, ileostomy fashioned alone with pelvic drain and Ryle's tube placed.

Patient was ambulated after 12 hours of surgery and on day 2, his stoma started functioning and routine investigations got better (Figure 4). He was started on sips of water on day 4 of surgery and was discharged on day 6 on liquid site with advise of stoma care.



Figure 4: Functional stoma output.

On exploring about deep into the cause of the foreign body intake, we came to know that patient's mother (who belonged to low socioeconomic status) worked in a magnet making factory and she was unaware about his act and took the child to hospital due to onset of fever.

Now patient is planned for stoma closure after 6 weeks after getting distal loopogram. Our main concern in this surgery was the proximal perforation which was 1 foot from DJ flexure. Had it got leaked (high chances in view of severe septicemic shock), patient would have landed into another surgery with short bowel syndrome.

DISCUSSION

Because of the increasing availability of toys and objects containing magnets, incidence of accidental ingestion has increased in the reported cases of said magnetic objects.^{3,9,11} A single object containing a magnetic element may pass through the gastrointestinal tract spontaneously without causing much damage (as in most cases). However, due to the nature of the attractive forces between magnets, the presence of 2 or more such objects or paramagnetic objects increases the risk of gastrointestinal complications; which may range from intestinal obstruction and ischemia to necrosis, fistula formation, and perforation.^{10,14,16}

Human cells contain ions like sodium, potassium, and chloride making it a conductor of the microscopic currents that form magnetic forces which acts through the gastrointestinal tract. If undetected and untreated, magnetic foreign bodies gradually erode the bowel wall, causing pressure necrosis to its mucosa and subsequent perforation. Therefore, early diagnosis and treatment are of utmost importance. In some cases, where a parent has witnessed a child swallowing such foreign object, or the child is old enough to state so, history is clear. While clinical presentation may be nonspecific, close attention ought to be paid to children exhibiting obstructive symptoms, such as nausea, vomiting, and abdominal pain; which in turn should prompt radiographic examination. Magnetic beads or toys often have a characteristic bond and appearance.

Arrival at a diagnosis of magnetic foreign body ingestion may be delayed due to vague history or non-awareness of the same. However, with the increasing availability and popularity of toys with magnetic elements, one must maintain a low index of suspicion; especially considering the serious complications that may ensue. Owing to the length of the small bowel, it is most commonly affected by complications compared to other parts of the gastrointestinal system. This is followed by fistulas between the small bowel and colon, and stomach and jejunum.¹²

Intervention may be either endoscopic, laparoscopic, or open surgical exploration. The selection of a treatment modality is guided by history, physical examination, and radiological investigations. In the aforementioned patient, due to gross air under diaphragm and severe septicemic shock, conventional open technique was used with midline laparotomy and stoma was created in view of perforation repair at high pressure zone (IC junction).

CONCLUSION

The rising availability of magnetic toys and objects has led to an increase in the cases of ingestion of said foreign bodies in the pediatric population. Unlike most cases of foreign body ingestion, the presence of magnetic and paramagnetic elements imposes the risk of serious injury to the gastrointestinal tract. While history and clinical presentation are often ambiguous, it is paramount that physicians carefully investigate the patient; a simple plain abdominal radiograph may suffice in revealing any dense foreign bodies of metallic densities. Moreover, parents and caregivers ought to be made aware of the risks of magnetic toys, particularly those small enough to be swallowed. Early diagnosis and management may significantly decrease and even prevent the complications and associated morbidity with magnetic foreign body ingestion.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Altokhais TI, Al-Saleem A, Gado A, Al-Qahtani A, Al-Bassam A. Esophageal foreign bodies in children: emphasis on complicated cases: Asian J Surg. 2017;40:362-6.
2. Saki N, Nikakhlagh S, Safai F, Peyvasteh M. Esophageal foreign bodies in children. Pak J Med Sci. 2007;23:854-6.
3. Brown JC, Otjen JP, Drugas GT. Pediatric magnet ingestions: the dark side of the force. Am J Surg. 2014;207:754-9.
4. McCormick S, Brennan P, Yassa J, Shawis R. Children and mini-magnets: an almost fatal attraction. Emerg Med J. 2002;19:71-3.
5. Kramer RE, Lerner DG, Lin T, Manfredi M. North American Society for pediatric gastroenterology, hepatology, and nutrition endoscopy Committee. Management of ingested foreign bodies in children: a clinical report of the NASPGHAN Endoscopy Committee: J Pediatr Gastroenterol Nutr. 2015;60:562-74.
6. Han Y, Youn JK, Oh C, Lee S. Ingestion of multiple magnets in children. J Pediatr Surg. 2020;55:2201-5.
7. Silverman JA, Brown JC, Willis MM, Ebel BE. Increase in pediatric magnet-related foreign bodies requiring emergency care. Ann Emerg Med. 2013;62:604-8.
8. Alfonzo MJ, Baum CR. Magnetic foreign body ingestions. Pediatr Emerg Care. 2016;32:698-702.
9. George AT, Motiwale S. Magnet ingestion in children – a potentially sticky issue? Lancet. 2012;379:2341-2.
10. Chung JH, Kim JS, Song YT. Small bowel complication caused by magnetic foreign body ingestion of children: two case reports. J Pediatr Surg. 2003;38(10):1548-50.

11. Lee BK, Ryu HH, Moon JM, Jeung KW. Bowel perforations induced by multiple magnet ingestion. *Emerg Med Australas.* 2010;22(2):189-91.
12. Si X, Du B, Huang L. Multiple Magnetic Foreign Bodies Causing Severe Digestive Tract Injuries in a Child. *Case Rep Gastroenterol.* 2016;10(3):720-7.
13. Oestreich AE. Worldwide survey of damage from swallowing multiple magnets. *Pediatr Radiol.* 2009;39(2):142-7.
14. Liu S, Li J, Lv Y. Gastrointestinal damage caused by swallowing multiple magnets. *Front Med.* 2012;6(3):280-7.
15. Lin A, Chan LCN, Hon KLE, Tsui SYB, Pang KKY, Cheung HM, et al. Magnetic Foreign Body Ingestion in Children: The Attractive Hazards. *Case Rep Pediatr.* 2019;2019:3549242.

Cite this article as: Bajwa JS, Arnav A, Bhatia IS, Singh A. Sheer negligence turned into nightmare for a child: a case report of multiple magnetic foreign bodies intake. *Int Surg J* 2025;12:106-9.