

A Curious “Appendicitis”, Magnetic Foreign Bodies Ingestion In a Five Year Old Girl With Ileal Perforation. Case Report and Review of Literature.

Alaa Ghallab (✉ alaaghallab1969@hotmail.com)

King Fahd Armed Forces Hospital <https://orcid.org/0000-0001-6283-7947>

Alexander Wilkson

Hull Royal Infirmary

Rajio Daniel

Hull Royal Infirmary

Research Article

Keywords: Foreign Body, Magnetic, Appendicitis, Laparotomy

Posted Date: December 30th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-906623/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background

Foreign body ingestion is common in children. Ingestion of multiple magnetic foreign bodies poses a significant risk of complications as they are unlikely to pass spontaneously.

Case presentation

We present our interesting case of a 5 Year old girl, complaining of right iliac fossa pain not relieved with paracetamol, associated with 2 episodes of vomiting and one episode of loose bowel motion. Abdominal examination revealed tender right iliac fossa with weak rebound and mild guarding with no rigidity. WBC was 16.9, with 12.68 neutrophils, with normal urea, creatinine, amylase, CRP and liver function tests. Patient was admitted for suspected appendicitis versus gastroenteritis.

Abdominal ultrasound showed free fluid in the pelvis, appendix was not seen and there was a mass in the right iliac fossa. The patient was started on intravenous co-amoxiclav and diagnostic laparoscopy revealed a normal appendix with free fluid in pelvis. The omentum was stuck to terminal ileum with two necrotic patches and a perforation in the terminal ileum with magnetic foreign bodies protruding from the perforation site. There was no peritoneal contamination.

Laparotomy was performed via right lower transverse incision with resection & anastomosis of necrotic perforated bowel segment and removal of three magnetic foreign bodies from the terminal ileum. Patient had smooth postoperative recovery.

Conclusion

The Ingestion of multiple magnets, or a magnet with a metallic object should be considered an impending surgical emergency as it is unlikely to pass spontaneously and complications are more likely. There are no reports where more than one magnet was passed spontaneously. The possibility of foreign body ingestion should always be considered in a young child presenting with abdominal symptoms. Early intervention is indicated if the history, clinical findings and imaging are suggestive of multiple magnetic ingestion to prevent serious life threatening complications.

Background

Foreign body ingestion is common in children. The majority of ingested foreign bodies pass spontaneously through the gastrointestinal (GI) tract without difficulty, but serious complications can occur. Ingestion of magnetic foreign bodies poses a significant risk of complications due to proximate attraction through the intestinal wall leading to bowel perforation, fistula and obstruction.

Case Presentation

5 years old girl referred by her general practitioner with a history of right sided abdominal pain which woke her mother at midnight. She complained of right iliac fossa pain not relieved with paracetamol, associated with two episodes of vomiting and one episode of loose bowel motion.

On examination, she was in mild pain, not distressed, her vital signs were stable. Abdominal examination revealed tender right iliac fossa with weak rebound and mild guarding with no rigidity. WBC was 16.9, with 12.68 neutrophils, normal urea, creatinine, amylase, CRP and liver function tests. Patient was admitted for suspected appendicitis versus gastroenteritis.

Patient was kept nil per mouth, started on Intravenous fluids and analgesics for review in the morning. The girl was reviewed on the morning round by team, she was still in pain with a tender right iliac fossa and guarding. Abdominal ultrasound showed free fluid in the pelvis, appendix was not seen and there was a mass in the right iliac fossa. Patient was started on intravenous co-amoxiclav and consented for laparoscopic appendectomy ± proceed.

Diagnostic laparoscopy revealed a normal appendix with free fluid in pelvis. The omentum was stuck to terminal ileum which had two necrotic patches and a perforation. The magnetic foreign bodies were protruding from the perforation site but there was no peritoneal contamination (Fig. 1A).

Laparotomy was performed via right lower transverse incision with resection & anastomosis of necrotic perforated bowel segment and removal of three magnetic foreign bodies from the terminal ileum (Fig. 1B). Patient had smooth postoperative recovery.

Discussion

Foreign body (FB) ingestion is a potentially serious problem that peaks in children aged six months to three years because of their increased mobility and natural propensity for experimentation¹.

In our case report there was no history of ingestion of any foreign body, nevertheless, in this age group foreign body ingestion needs to be considered when symptoms are atypical.

Children ingest a variety of small objects such as toys, coins, pins, batteries, pieces of bones and jewellery. Accidental ingestion of magnetic foreign bodies has become more common owing to the increasing availability of magnetic elements in toys, jewellery and in holding art in refrigerators². The newer rare earths magnets represent a substantial risk.

A single ingested magnet can pass through the GI tract spontaneously. However ingestion of multiple magnets or a single magnet along with another metallic object can attract each other from a distance as much as five centimeter apart and exert up to 2.500g of force². With that much force magnets, or a magnet with another metal object can stick together and the interposed walls of bowel, stomach, colon can undergo pressure necrosis leading to perforation, fistula and obstruction^{2,3}.

Perforation occurs in less than 1% of all cases of foreign bodies ingestion, with the most common site of perforation being the ileocecal area (75%)⁴.

Usually perforations are multiple in magnets ingestion³. In our case, there was one perforation and two areas of necrotic tissue in terminal ileum with no peritoneal soiling as the magnet produced a slow perforation giving time for the body to wall off the perforation.

Despite the fact that most ingested foreign bodies pass spontaneously in 80 to 90% of cases and a large proportion can be removed endoscopically, about 1500 die annually in the USA. Most cases of ingested foreign bodies occur in children¹. Children with preexisting GI abnormalities (TOF, stenosing lesions, or previous GI surgery) are at a high risk for complication.

The current recommendation is any suspected magnet ingestion in the stomach should be removed endoscopically. If, however the magnets have reached the intestine, complications are more likely⁵.

Children less than five years old presenting with abdominal pain should be questioned about possible FB ingestion and abdominal radiography is a good tool for diagnosis. Ingestion of magnet should be suspected if metallic object fails to progress².

Conclusion

The Ingestion of multiple magnets, or a magnet with another metallic object should be considered an impending surgical emergency as it is unlikely to pass spontaneously and complications are more likely. There are no reports where more than one magnet was passed spontaneously. The possibility of foreign body ingestion should always be considered in a young child presenting with abdominal symptoms. Early intervention is indicated if the history, clinical findings or imaging are suggestive of multiple magnetic ingestion to prevent serious life threatening complications.

Abbreviations

Foreign body (FB), Gastrointestinal (GI), United states of America (USA), Tracheoesophageal fistula (TOF).

Declarations

Ethical approval and consent to participate: Approval was obtained from the Research Ethics committee. Parents were informed about all steps in the procedure

A written consent was obtained from parents

Consent for Publication: agree to consent for publication

Availability of data and material: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests: None.

Funding: None

Author Contributions

All authors contributed equally in the writing of this manuscript. A G contributed specifically in writing the manuscript and operative technique. A W contributed in editing the figure and consenting the parents. R D contributed in editing the manuscript and operative technique. All authors have read and approved the manuscript and ensure that this is the case.

Acknowledgements: None

References

1. Lai AT, Chow TL, Lee DT, et al. Risk factors predicting the development of complications after foreign body ingestion. *Br J Surg*. 2003;90(12):1531–1535.
2. Lee SK, Beck NS, Kim HH. Mischievous magnets: unexpected health hazard in children. *J Pediatr Surg*. 1996;31(12):1694–1695.
3. Melissa M Tavarez ¹, Richard A Saladino, Barbara A Gaines, Mioara D Manole,. Prevalence, Clinical Feature and Management of Pediatric Magnetic Foreign Body Ingestion. *J Emerg Med* PMID: 22727803. 2013 Jan;44(1):261-8. doi: 10.1016/j.jemermed.2012.03.025. Epub 2012 Jun 23. DOI: 10.1016/j.jemermed.2012.03.025
4. Arana A, Hauser B, Hachimi-Idrissi S, et al. Management of ingested foreign bodies in childhood and review of the literature. *Eur J Pediatr*. 2001;160(8):468–472.
5. Uyemura MC, Foreign body ingestion in children. *Am Fam. Physician* 2005 Jul 15;72(2):287–291.

Figures



A



B

Figure 1

A. The magnetic foreign bodies were protruding from the perforation site but there was no peritoneal contamination.

B. Laparotomy was performed via right lower transverse incision with resection & anastomosis of necrotic perforated bowel segment and removal of three magnetic foreign bodies from the terminal ileum.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [CAREchecklistEnglish2023.pdf](#)