Reminder of important clinical lesson

The magnetism of surgery: small bowel obstruction in an 8-year-old boy

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Correspondence to R Clarke, roboclarke@msn.com**Summary**

An 8-year-old boy with Asperger's syndrome presented with right-sided abdominal pain, which was consistent with a probable appendicitis, but revisiting the history with a high index of suspicion confirmed multiple foreign body ingestion to be the cause of his symptoms. An emergency laparotomy was performed. Multiple toy magnets and other metal objects were found, which were causing small bowel obstruction with interloop fistulation. Following removal and repair, the patient made an excellent recovery.

BACKGROUND

This case emphasises the importance that clinical history has when making a diagnosis. We report this rare and interesting case that is relevant to both surgical and medical specialities. It highlights the challenges that may be encountered in patients with learning difficulties, and where appropriate intervention and judicious investigation will ensure optimum outcome. Small bowel obstruction is a common and important surgical presentation. The initial management is correction of any fluid and electrolyte imbalance with intravenous fluids, combined with small bowel decompression by the passage of a nasogastric tube.¹ Indications for early surgical intervention include incarceration and strangulation of any hernia or the presence of peritonitis. The classic clinical advice that 'the sun should not both rise and set' on a case of non-resolving acute intestinal obstruction is sound and should be followed unless there are positive reasons for delay.² We report a case of multiple toy magnets and metallic object ingestion causing small bowel obstruction and fistula in an 8-year-old boy.³

CASE PRESENTATION

An 8-year-old boy with Asperger's syndrome was admitted with a 2-day history of right-sided abdominal pain. The pain was constant with no radiation and there was associated nausea, vomiting, fever and loss of appetite. Unusually, he had not opened his bowels over the preceding 3 days. He had admissions in the past with food refusal and pica (compulsive ingestion of non-food substances), which had required nasogastric feeding. He had no history of previous surgery. On examination, he had low-grade temperature but was not tachycardic. He had right-sided abdominal tenderness with no hernias and bowel sounds were present. The white cell count (WCC) was slightly elevated, with a normal C reactive protein and urine dip had ketones only. The clinical impression was that of early appendicitis. Antibiotics and intravenous fluids were commenced with observation overnight with a view to possible appendicectomy the following morning. Nurses reported a

comfortable night, but on morning review the pain was more generalised with guarding in the right iliac fossa. Appendicitis seemed likely and an operation was planned for that day. When this was discussed with his mother, she raised concerns about his history of foreign body ingestion although had not been witness to any event of ingestion over the past 3 months. After discussion, it was decided to arrange an abdominal radiograph prior to theatre (figure 1) confirming the presence of the toy magnets and bolts.

He was taken to the theatre for laparotomy, which revealed small bowel obstruction. In addition, he had a number of small bowel fistulae, due to the ingested magnets causing separate loops of bowel to adhere to each other. A number of toy magnets, screws and bolts were retrieved (figure 2). The small bowel enterotomies were oversewn and an appendicectomy performed. His postoperative recovery was uneventful. The patient did, however, require a prolonged stay in the hospital with multidisciplinary input to manage food fear and behavioural difficulties surrounding feeding.

DISCUSSION

Small bowel obstruction is a common and an important surgical presentation. The initial management is correction of any fluid and electrolyte imbalance with intravenous fluids, combined with small bowel decompression by the passage of a nasogastric tube.¹ The presence of peritonitis, or hernia incarceration and strangulation is an indication for early surgical intervention.

Foreign body ingestion is commonly seen in the accident and emergency setting, most frequently in paediatric (80%), older, mentally impaired or alcoholic patients. However, foreign body ingestion is a rare cause of small bowel obstruction as 90% of ingested foreign bodies pass through the gastrointestinal tract without complications.⁴ Ingestion of a single magnet is expected to behave as any other foreign body, however, ingestion of multiple magnets can result in bowel perforation, bowel obstruction, volvulus, bowel necrosis, peritonitis, sepsis and death.^{5 6} Conservative management is thus less appropriate in

Figure 1 Plain abdominal radiograph showing dilated small bowel loops and the presence of metallic foreign bodies.

cases of multiple magnet ingestion. At 8 years of age, our patient is older than an average child presenting with foreign body ingestion. The literature concludes that 80% of cases of ingestion will involve children between the ages of 6 months and 3 years.⁷ Our case presented with right-sided abdominal pain, fever with an elevated WCC, and therefore appendicitis was rightly the main differential diagnosis. It was only on revisiting the history and in further discussion with the patient's mother that the past habit of foreign body ingestion with the possibility of small bowel obstruction became apparent. When looking at the case retrospectively, there are clues that could have highlighted a small bowel obstruction with possible foreign body ingestion earlier. Initially, given the fact that he

was a paediatric patient and had learning difficulties, these factors alone were indications of him being in a high-risk group for foreign body ingestion.⁴ Furthermore, despite the fact that he did not present with foreign body ingestion, given his medical history of pica, this was always a possibility. We feel that there was a good argument to remove his appendix even though histologically it turned out to be normal. In the future with the likelihood of further admissions, and difficult history, this would eliminate appendicitis as a cause and prevent a potentially serious delayed or missed diagnosis. We conclude that you should always have a high index of suspicion of foreign body ingestion in high-risk groups as early surgical intervention may be warranted.

Figure 2 Laparotomy with distended small bowel and visible magnets causing small bowel fistulation.

Learning points

- ▶ The classic clinical advice that ‘the sun should not both rise and set’ on a case of non-resolving acute intestinal obstruction is sound and should be followed unless there are positive reasons for delay.²
- ▶ Clinicians should have a high index of suspicion of foreign body ingestion in children and those with learning difficulties.
- ▶ Multiple magnet ingestion can result in serious intra-abdominal complications and should be carefully monitored with a low threshold for surgical intervention.
- ▶ Careful and thorough history taking will always remain one of the most important aspects of a patient’s assessment.

Competing interests None.

Patient consent Obtained.

REFERENCES

1. **Farquharson M**, Moran B. Small bowel obstruction. In: Kaster J, Burrows S, Smith L, eds. *Farquharson’s Textbook of Operative General Surgery*. Ninth edition. London: Hodder Arnold Ltd 2005:409–17.
2. **Williams N**, Bulstrode C, O’Connell P. *Bailey and Love’s Short Practice of Surgery*. 25th edition. London: Hodder Arnold Ltd 2008:1188–1203.
3. **Robinson AJ**, Bingham J, Thompson RL. Magnet induced perforated appendicitis and ileo-caecal fistula formation. *Ulster Med J* 2009;**78**:4–6.
4. **Pavlidis TE**, Marakis GN, Triantafyllou A, *et al*. Management of ingested foreign bodies. How justifiable is a waiting policy? *Surg Laparosc Endosc Percutan Tech* 2008;**18**:286–7.
5. **Dutta S**, Barzin A. Multiple magnet ingestion as a source of severe gastrointestinal complications requiring surgical intervention. *Arch Pediatr Adolesc Med* 2008;**162**:123–5.
6. **Kabre R**, Chin A, Rowell E, *et al*. Hazardous complications of multiple ingested magnets: report of four cases. *Eur J Pediatr Surg* 2009;**19**:187–9.
7. **Suk-koo L**, Nam-seon B, Hyun-Hahk K. Mischievous magnets: unexpected health hazard in children. *J Paediatr Surg* 1996;**31**:1694–5.

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