On-line Case Report

Attraction problems following magnet ingestion

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ABSTRACT

Ingestion of magnetic toys is associated with serious complications that can result in pressure necrosis and bowel perforation. We report three cases of multiple (more than two) magnet ingestion. In two patients, the symptoms did not resolve and complications of perforation and jejunocolic fistula occurred. The third patient, however, had early intervention with no resultant complication. The literature is reviewed and close observation and early surgical intervention is recommended.

Keywords: Foreign body ingestion – Magnets – Gastrointestinal – Perforation

Foreign body ingestion is common in the paediatric age group. Most are innocuous and pass without causing problems. However, multiple magnetic foreign bodies can cause serious complications. Early intervention has previously been recommended.¹ We describe the serious consequences if two or more magnets are ingested.

Case reports

Case 1

A 3-year-old male child presented with a 2-day history of vague abdominal pain. On examination, his abdomen was soft and non-tender. An abdominal X-ray showed a foreign body on the right side of abdomen. Four hours later, the child became tachycardic with increased intensity of the abdominal pain; on examination, there was generalised tenderness and guarding. A repeat abdominal X-ray revealed free air under diaphragm and

the foreign body at the same place (Fig. 1). Laparotomy revealed two perforations in the distal ileum, 20 cm from the ileocaecal junction and 10 cm apart. One magnet was at the proximal another was at the distal the perforation site. The perforations were closed and the child did well except for a minor wound infection. He was discharged on the 7th postoperative day. On close inquiry, his parents recalled that the child was playing with toy magnets a few days previously.

Case 2

An 11-year-old male child with developmental delay presented to the accident and emergency department with vague abdominal pain and a history of constipation. An abdominal X-ray showed a dumb-bell shaped foreign body (Fig. 2). Following questioning, the parents remembered that their child was playing with a magnetic

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Figure 1 Abdominal X-ray demonstrating free air under the diaphragm. The magnetic foreign body consisted of a 1.5-cm rod and a 5-mm ball.

toy one week prior. The child was admitted for observation and was discharged home the following day as he was clinically well. He was reviewed again after 3 weeks. The child had persistent abdominal pain and a repeat X-ray abdomen showed no change in the position of the foreign body. An elective laparotomy was performed which revealed a jejunocolic fistula with the central bar of the magnet crossing the fistula and two ball bearings on each side in dumb-bell configuration. Postoperative course was uneventful.

Case 3

A 3.5-year-old female child was seen with abdominal pain for 3 days in the accident and emergency department. The child was clinically well and she was sent home. She returned next day with continuing pain. A plain abdominal X-ray revealed five magnets in a line. The parents were not aware of the ingestion of magnets but said that she had been playing with a magnetic toy 3 days previously. The child was admitted and a repeat abdominal X-ray film demonstrated no change (Fig. 3). An elective laparotomy was performed which confirmed five magnets tightly attracted together forming a 12.5-cm rod in ileum preventing passage down the intestine. These

Figure 2 Magnet with two ball bearings in dumbbell configuration (consisting of a 2.5-cm rod and two 5-mm balls). Laparotomy revealed a jejunocolic fistula with the central bar of the magnet crossing the fistula.

were removed via a small enterotomy. No complications were noted and she made a satisfactory recovery.

Discussion

Children ingest a variety of objects such as coins, pieces of bone, jewellery, batteries, pins and all sorts of small objects. Many ingested foreign bodies pass spontaneously and are never brought to the attention of physicians. If the foreign bodies ingested are innocuous, an expectant policy is justified. If, however, more than one magnet is ingested, the magnets may be attracted and thus result in pressure necrosis between two loops of intestine resulting in perforation or fistula.¹ This may have been the cause of the surgical findings discovered at laparotomy in patients 1 and 2. Earlier reports of multiple magnet ingestion and their complications were from South Eastern Asia where they are traditionally used for curing body aches and pains.² Fifteen cases have been reported in the literature. Perforations, internal fistula, adhesions, intestinal obstruction and volvulus have all been described as complications of magnet ingestion.³

If in the stomach, the magnets can be removed endoscopically. If, however, the magnets have reached the intestine, complications are more likely. It is not clear

Figure 3 In patient 3, five magnets were seen on abdominal X-ray forming a straight rod configuration.

whether an exploratory operation is immediately necessary or whether a more conservative approach is justified. There are no reports where more than one magnet was passed spontaneously. A surgical approach is justified as all the previous case reports where more than one magnet was ingested describe complications. The second patient described herein demonstrates that waiting for more than a month does not result in spontaneous passage. Laparotomy and removal of the

magnets is recommended if there are abdominal symptoms. Vijaysadan *et al.*⁴ have modified the algorithm for the management of foreign body ingestion suggested by Henderson and *et al.*⁵ and agreed that early endoscopic or surgical intervention is needed for more than one magnet in the intestinal tract. We intervened early in the third patient because of the clinical symptoms and as the repeat X-rays did not show progression of the magnets. In the event, the magnets were attached to each other forming a long rod. It is unlikely that they would have passed spontaneously.

Conclusions

This case series shows that delays in treatment can result in serious problems when more than one magnet is ingested. Multiple magnet ingestion should be referred to a specialist paediatric surgical centre early, even if relatively minor clinical findings are present. If the history, clinical findings and imaging are suggestive of multiple magnetic ingestion, an early intervention is indicated to prevent serious life-threatening complications.

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