

CASE REPORT

Jejuno-jejunal fistula induced by magnetic necklace ingestion

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We describe the case of a 19-year-old mentally challenged woman who developed jejuno-jejunal fistula following ingestion of a magnetic necklace. This case report demonstrates the necessity of prompt treatment when the ingested intestinal foreign body is suspected to be multiple magnets, even if there are no sharp edges; and even when it seems the object could be evacuated spontaneously. Ingested magnets are capable of attracting each other across the bowel wall, leading to serious intestinal complications such as pressure necrosis, perforation, fistula formation, or intestinal obstruction.

Key Words: Foreign bodies, Ingested magnets, Intestinal fistula

INTRODUCTION

Foreign bodies that could lead to subsequent perforation or obstruction of the gastrointestinal tract are swallowed, usually accidentally, by children or adults. For the vast majority of patients, treatment is conservative, allowing safe passage of these objects through the intestinal tract [1]. Morbidity associated with ingestion is rare, and depends on the type of foreign body ingested [2]. The authors report the case of a rare intestinal complication caused by mischievous ingestion of magnets.

CASE REPORT

A 19-year-old mentally challenged woman presented

with abdominal pain of 3 days duration. The pain was vague, and located around the umbilicus. She had a history of repeated mischievous foreign body ingestion associated with mental retardation. Vital signs were stable, and the patient was not so ill-looking. Her abdomen was mildly distended and tender without peritoneal sign. Stool guaiac was negative. Laboratory investigation results were unremarkable, including normal white blood cell and differential cell counts. A plain abdominal radiograph showed the shadow of a string of small beads in lower abdomen (Fig. 1). No free air was present. Abdominal computed tomography scan revealed foreign bodies of probable metallic origin within the small bowel. As there was no evidence of serious complications, initially, expectant treatment was planned awaiting spontaneous passage. However, after 2 days, the shadow of the foreign bodies on

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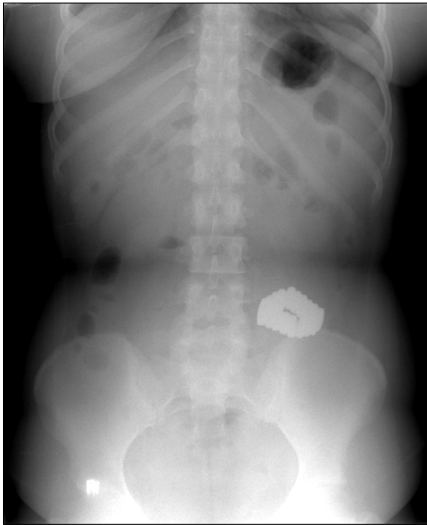


Fig. 1. Simple abdominal radiograph shows radiopaque foreign bodies.

serial radiographs remained unchanged, and then, explorative laparotomy was performed.

At laparotomy, an adherent jejunal loop containing the foreign bodies was found 20 cm distal to the ligament of Treitz (Fig. 2). Further exploration revealed that these objects were 19 beads of a magnetic necklace which had come in contact with each other, compressing the interposed bowel walls, resulting in necrosis and the formation of a jejun-jejunal fistula (Fig. 3). Segmental resection of the fistula formed a jejunal loop and an incidental appendectomy was performed.

On inquiring of the patient's mother of any possible inciting event, she recalled that the patient had played with a magnet necklace during a visit to her cousin's home 2 weeks prior. Hence, we suspected that the ingestion occurred 2 weeks prior to hospital admission. Her post-operative recovery was uneventful, and she was discharged from the hospital 9 days after surgery.

DISCUSSION

In Korea, Japan, and China, magnets are employed as a traditional remedy to relieve stiffness in the shoulders and neck, as well as to improve peripheral circulation. Unfortunately, in these countries, magnets are easily accessible

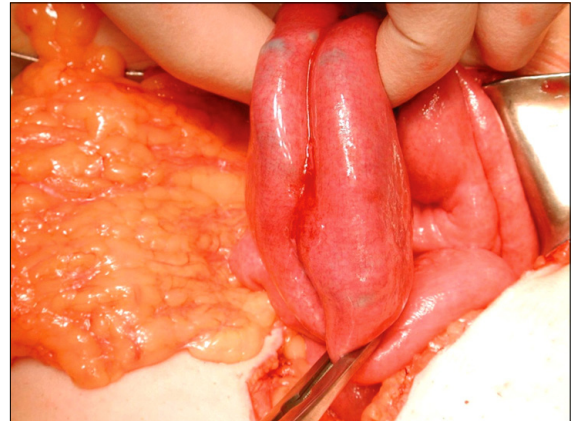


Fig. 2. Intraoperative photograph shows adherent jejunal loop containing foreign bodies.

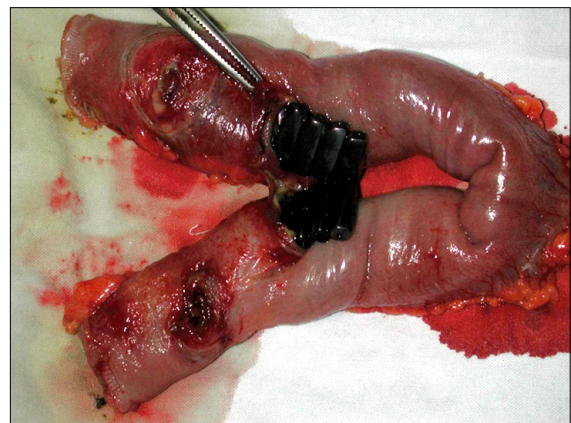


Fig. 3. Resected specimen photograph shows jejun-jejunal fistula by compression necrosis caused by ingested magnetic bead.

in local pharmacies, and are produced in a small enough size to swallow, passing through the alimentary tract after accidental ingestion [3,4].

Magnet ingestion is becoming more common due to the popularity of magnetic toys. In many of the toys, the magnets are embedded in plastic parts, though they become easily detached [5]. Psychiatric illness in older children and adults, as our case, may also be a risk factor for ingestion of foreign bodies [6]. Possible predisposing psychological conditions include autism, developmental delay, mental retardation, attention deficit hyperactivity disorder, Angelman syndrome, neurosis, reactive attachment, and anxiety [7]. So parents and doctors should be alerted to the dangers of these toys.

Although the ingestion of a single magnet may not be problematic, multiple magnets can pass into the lumen of the intestine separately or in groups, and then attract each other, holding the intestinal walls between them. The affected areas of the walls then become compressed and necrotic, resulting in intestinal perforation or fistula [6,7]. Moreover, if the mesenteric vessels are involved between the walls, intraperitoneal hemorrhage may also occur [8]. In an experimental analysis of the actual magnets removed from a patient, the force produced by any two magnets is inversely proportional to the square of the distance between them [9]. This translates to a dramatic drop in force with increasing distances between any two magnets. One can appreciate how these magnetic forces generate such powerful effects and injuries within the intestines.

In our case, the magnetic attraction between the components of the necklace resulted in the unusual appearance of ingested foreign bodies on plain radiograph. Therefore, the causal relationship between the foreign body and intestinal fistula formation was not recognized preoperatively.

In conclusion, psychiatric illness in older children and adults, as in our case, may also be a risk factor for ingestion of foreign bodies. Although ingested nonmagnetic foreign bodies are likely to be passed spontaneously without consequence, ingested magnets may attract each other through the intestinal wall and cause severe gastrointestinal complications. Thus, close observation and early surgical intervention should be considered after ingestion of magnets.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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