

Small Bowel Obstruction and Covered Perforation in Childhood Caused by Bizarre Bezoars and Foreign Bodies

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Abstract

Background: Small bowel obstruction with perforation is an unusual and rare complication of bezoars.

Objective: To describe our use of emergency laparotomy to treat intestinal obstruction caused by bizarre bezoars.

Conclusions: An aggressive surgical approach to intestinal obstruction in the pediatric disabled or mentally retarded population is recommended.

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Bezoars are impactions of swallowed material along the gastrointestinal tract. The word "bezoar," derived from the Arabic *bazahr* or the Persian *Padzehr*, dates 2,000–3,000 years back and means counter-poison or antidote. As such, bezoars were collected from the stomach of the Syrian goat and consist of a greenish hard concretion thought to be an effective treatment for poisoning. Bezoar powder was used to treat a wide range of maladies including vertigo, epilepsy, plaque, leprosy, dysentery and old age. Bezoar stones were decorated with gold and jewels and used as amulets. The first to describe bezoars as a human disease was the Frenchman Baudament in 1779. The removal of bezoars surgically was first carried out by Schonborn [1]. De Bakey and Ochsner's review of 311 cases published in 1938 remains the most comprehensive reference on the subject [2], and most other studies in the literature are case reports.

Bezoars are defined by their content. Phytobezoars consist of undigested fruit or vegetables, usually found in adults who undergo gastric surgery. The most common phytobezoars worldwide are related to the ingestion of the persimmon fruit. Trichobezoar consists of hair, and over 80% are found in patients under 30 years of age, 90% of them females. According to De Bakey and Ochsner's report, only 9% of cases were psychiatric patients, who also had trichotillomania and trichophagia. Other bezoars include foreign bodies and medications such as antacids, opiates, anticholinergics, calcium blockers, sucralat, ferrous sulfate, etc. [3].

The overall incidence of small bowel obstruction due to bezoars is low (0.3–6% of all intestinal obstructions). Most bezoars are formed in the stomach from where they

may migrate and cause small bowel obstruction. Primary small bowel bezoars are rare and can occur within small bowel diverticula, along with strictures and adhesions, and in cases of decreased intestinal motility. Most of the gastric bezoars can be treated conservatively by endoscopic retrieval, enzymatic fragmentation, and nasogastric lavage. Surgical removal is indicated in most cases of intestinal obstruction that are refractory to conservative treatment. Small bowel perforation is a rare complication, induced mostly by sharp foreign bodies and less frequently by pressure necrosis of blunt bezoars.

In general, bezoars are rarely found in healthy children. The common types are lactobezoars, foreign bodies and trichobezoars. Lactobezoars are composed of milk curds, have rarely been reported to cause intestinal obstruction, and are found exclusively in neonates and small infants. Foreign bodies are frequently found in children under 2 years of age and in older mentally retarded children, with blunt objects possibly causing intestinal obstruction while sharp objects may cause perforation. Trichobezoars are the most common bezoars causing perforation in children (3.2% in De Bakey's study). The Rapunzel syndrome, a rare trichobezoar (11 cases reported in the literature) with a tail, extends beyond the ileocecal valve and can cause small bowel perforation by pressure necrosis of the string of hair along the mesenteric wall [4].

We present four cases of intestinal obstruction — two cases with perforations and one with imminent perforation — all caused by soft, rather than sharp bezoars.

Case Descriptions

Case 1

An 11-year-old severely retarded girl with an incomplete small bowel obstruction was transferred from the pediatric ward to the surgical department in the Schneider Children's Medical Center. Two weeks before admission she was hospitalized in the same pediatric department because of bilious vomiting and the same picture of incomplete small bowel obstruction, which resolved after 4 days of conservative treatment. The patient was known to suffer from William's syndrome with epilepsy and severe psychomotor retardation and was permanently hospital-



Figure 1. Rubber nipple of a bottle, removed from the terminal ileum of an 11-year-old retarded girl (case 1).

ized in an institution for chronically debilitated children. There was no history of previous surgery.

On admission the girl was pale, with body temperature of 38°C and normal vital signs. Localized peritoneal irritation was found in the right lower quadrant. White cell count was 12,000/mm³. The plain abdominal X-ray showed a typical picture of low intestinal obstruction. During surgery an obstruction of the terminal-ileum with covered perforation was observed. A foreign body with conglomerated foodstuff adhered to the site of the obstruction. Limited resection of this ileal loop with end-to-end anastomosis revealed the obstructive foreign body to be a large nipple of a bottle, which apparently intermittently obstructed the ileum, depending on the direction of its opening [Figure 1]. The perforation was caused by pressure necrosis. The patient recovered and was discharged 5 days after the operation.

Case 2

A 4-year-old boy was transferred to our center's emergency department because of colicky abdominal pain, recurrent bilious vomiting and lack of bowel movement for one week. His past medical history included a percutaneous endoxic gastrostomy insertion at age 7 months because of failure to thrive. The PEG was later changed to a button gastrostomy and finally removed at age 2 when the child was gaining weight with oral feeding.

On admission the child was alert with normal vital signs. Body temperature was 37.8°C. Physical examination revealed a mild abdominal distension and diffuse tenderness with high pitch peristalsis. Laboratory tests were normal. An abdominal X-ray showed a small bowel obstruction with a PEG-like foreign body in the right lower quadrant. Treatment consisted of fluid resuscitation, intravenous antibiotic and urgent laparotomy, which revealed a PEG-like shape foreign body bezoar [Figure 2] embedded in the terminal ileum 13 cm proximal to the ileocecal valve, with two small perforations covered with

omentum. A segmental resection (5 cm) with end-to-end anastomosis was performed. The postoperative course was uneventful and the boy was discharged 6 days after surgery.

Case 3

A 17-year-old mentally retarded boy was admitted to our department with complaints of lack of bowel movement for 3 days, recurrent vomiting and colicky abdominal pain that began on the day of admission. No previous history of surgery, trauma or other abdominal illness was documented.

On admission, vital signs and body temperature were normal. Mild abdominal distension with diffuse tenderness was observed. The white cell count was 13,000/mm³. Plain abdominal X-ray demonstrated a typical picture of small bowel obstruction, with an unclear opacity on the right lower quadrant.

Immediate laparotomy showed a terminal ileal obstructing mass that resembled a bezoar with an imminent perforation in the center. The foreign body bezoar was removed through an ileotomy and was identified as a folded piece of rubber [Figure 3]. The postoperative course was good and the boy was discharged 5 days after the operation.

Case 4

A 2-year-old girl was admitted because of colicky abdominal pain and vomiting during the previous 12 hours. Physical examination revealed a mild abdominal distension and a slightly tender swelling in the right groin. Laboratory tests were normal. An abdominal X-ray showed dilated loops of small bowel with fluid levels.

An inguinal hernia containing a loop of small intestine without signs of strangulation was found during emergency exploration. The intestine was blocked by impacted solid content that prevented reduction of the hernia. Further exploration revealed that the same material was also obstructing the entire terminal ileum. A bezoar containing large amounts of undigested whole peanuts was removed through a small ileotomy [Figure 4].

The postoperative course was uneventful, and the girl

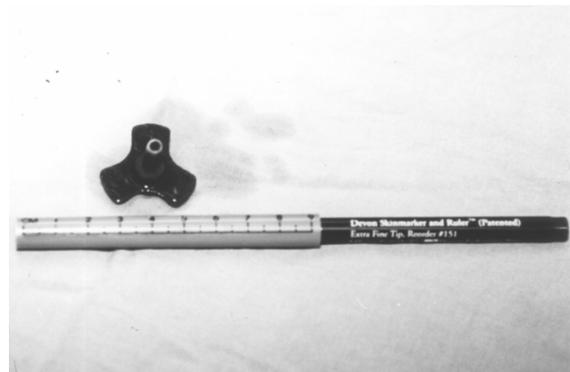


Figure 2. Rigid internal bolster of a PEG, removed from terminal ileum of a 4-year-old boy (case 2).

PEG = percutaneous endoxic gastrostomy



Figure 3. Folded rubber foreign body, removed from the terminal ileum of a 17-year-old retarded boy (case 3).



Figure 4. Undigested peanuts collected from the terminal ileum of a 2-year-old girl (case 4).

was discharged 4 days after surgery. The girl's father later admitted that he had given her peanuts to eat on the previous day and was very proud of the eagerness with which she had swallowed them.

Discussion

In the pediatric population, the common types of bezoars are lactobezoars, trichobezoars and foreign bodies. Although rare in healthy children, bezoars can present serious surgical problems. Our report describes four cases of bizarre foreign bodies, bezoars. Children under the age of 2 years are at risk for swallowing foreign bodies such as coins, buttons, screws, parts of toys, bubble gum, candies, medications, etc. Swallowing bizarre objects can occur at a more advanced age, mainly among the mentally retarded, as in cases 1 and 3, or in children with psychiatric disorders.

Most foreign bodies that reach the stomach can pass through the gastrointestinal tract spontaneously. Delay in transit can occur at sphincter zones (pylorus ileocecal valve) or points of constrictions (ligament of Treitz, adhesions) and it can take several weeks for large objects to pass. Small bowel obstruction is an uncommon complication of such cases. Fewer than 10% occur in the general population [2], and in children it is even less common. In

all four cases described here, intestinal obstruction was the presenting symptom. Sharp foreign bodies (needles, pins, shaving blades) pose an obvious risk of perforation. In some cases surgical removal by gastrotomy or enterotomy is necessary. Other cases can be followed conservatively.

However, two of our four cases (cases 1 and 3)—perforation of the small bowel and imminent perforation, respectively—were caused by a soft rubber foreign body and not by a sharp object. The mechanism of pressure necrosis is rarely described in the literature. Another aspect is the need for a more aggressive approach to intestinal obstruction in disabled or mentally retarded children, like cases 1 and 3, contrary to the usually adopted tendency for a prolonged conservative trial of treatment. Bezoars should be suspected in cases of bowel obstruction in these children.

The issue of PEG ileus and complications of retained internal bolster after removing or replacing the PEG is described in the literature [5,6]. There are only four reported cases of bowel perforation due to retained bolster. In our case 2, the retained bolster had been lodged in the terminal ileum for 2.5 years (!) and became symptomatic only after causing pressure necrosis with covered perforation and intestinal obstruction. In children, a soft silastic catheter without an internal bolster should be used, or an endoscopic retrieval of the internal device should be undertaken routinely [6]. We agree with Coventry et al. [7] that in the pediatric population, an early operative removal is recommended if the PEG parts have not passed through the stools and are evident in the small intestine on X-ray for 3 or more weeks after PEG separation. We would adopt this policy for any foreign body lodged in the gastrointestinal tract in children when there has been no progression for more than 3 weeks.

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