

Case Report

Peritonitis with small bowel perforation caused by jujube pit in a 3-year-old child: a case report

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Abstract: Ingested foreign bodies are common and concerning problems of childhood. However, perforation of the gastrointestinal tract by ingested foreign bodies is extremely rare, accounting for <1% of cases. We herein report a case involving a 3-year-old child who presented to the emergency room with complaints of abdominal pain, nausea, recurrent bilious vomiting, and fever. He had no history of underlying intestinal disease. After an initial investigation, peritonitis was diagnosed and surgical treatment was performed. During the operation, a small bowel micro-perforation and a jujube pit were found in the jejunum. The patient recovered and was discharged 7 days after the operation. This case is being reported to draw attention to the possibility of intestinal obstruction and perforation by the pit of the jujube fruit. A high index of suspicion is needed because this foreign body is not radiopaque and cannot be detected by X-ray investigations.

Keywords: Children, jujube pit, perforation

Introduction

Foreign body ingestion most commonly occurs in children aged 6 months to 3 years [1]. Only 1% of ingested foreign bodies within the gastrointestinal tract require a surgical operation; 10% to 20% are successfully removed by non-operative methods such as endoscopy [2]. Gastrointestinal tract perforation and complications due to ingestion of a foreign body are extremely rare but can occur in patients with a hernia sac. Objects that cause perforation are usually sharp, pointed, or elongated, such as fish bones and needles. The perforation can occur anywhere along the gastrointestinal tract; however, it usually occurs in areas of narrowing such as the terminal ileum. We herein report a case of small bowel obstruction with perforation in a 3-year-old boy caused by accidental swallowing of a jujube pit.

Case report

A 3-year-old boy was admitted to the pediatric surgical department of Xu Zhou Center Hospital with a 4-day history of abdominal pain, nausea, recurrent bilious vomiting, and fever. Physical examination showed diffuse tenderness and

rebound tenderness in the entire abdomen with voluntary muscle guarding. His body temperature was 38.8°C. Laboratory tests indicated a white cell count of 11.0 with neutrophilia of 7. Abdominal X-ray showed typical findings of small bowel obstruction (**Figure 1A**). Our presumptive diagnosis was acute peritonitis based on the patient's symptoms. Empirical antibiotics were administered immediately, and a computed tomography scan showed edema of the intestinal wall with no evidence of free air in the peritoneal cavity (**Figure 1B**). An emergency exploratory laparotomy was performed on the same day. The peritoneal cavity contained a considerable amount of thin, purulent, malodorous material containing strands of fibrin and particles of food. On further exploration, a lesion was found at about the jejunum, 100 cm above the Treitz ligament. A 5-cm segment of bowel in this area was clearly thickened and edematous. Localized inflammation and abscess formation were also identified (**Figure 2**). A hard foreign body could be felt within the bowel. The segment of bowel was then opened and the foreign body removed. It was obviously a pit from some kind of fruit and was shaped like the pit of a jujube (**Figure 3**). The patient recovered

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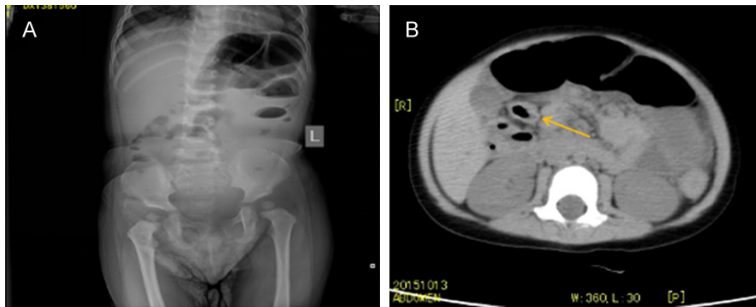


Figure 1. Preoperative radiological findings. A. X-ray of the abdomen (sagittal plane) showed distension of the small bowel with air-fluid levels and no free air. B. Computed tomography scan of the abdomen showed extreme distension of the colon and edema of the intestinal wall (arrow).



Figure 2. A perforation and fecal exudation were detected at the mesangial side wall of the terminal jejunum (blue arrow).



Figure 3. Photograph showing specimens of jujube fruit.

uneventfully and was discharged on postoperative day 7. At the 2-week follow-up, he was asymptomatic. A retrospective history taken

after surgery revealed that the patient had ingested a jujube 6 days before admission.

Discussion

Accidental ingestion of a foreign body rarely occurs, and perforation occurs in <1% of patients with ingested foreign bodies; in children, perforation it is even less common [3]. More than 90% of foreign bodies pass through the intestine if they reach the stomach.

The most common sites of intestinal perforation by a foreign body are the ileocecal region and rectosigmoid junction because of the immobile and rigid nature of the duodenum as well as its deep transverse rugae and sharp angulations, which make it a common site for the entrapment of long and sharp objects [4, 5]. A precise diagnosis is often challenging because children swallow foreign bodies without an eyewitness, and clinical presentations vary depending on the site of perforation and extent of peritonitis. In a retrospective review, only 50% of children with confirmed foreign body ingestion were symptomatic [6]. Because these patients usually do not remember the foreign body ingestion, the final diagnosis is frequently delayed. Computed tomography scans and ultrasonography may help clinicians in this challenging situation; in most patients, however, the diagnosis is not confirmed until the surgical intervention.

Because our case involved child without a known history of foreign body ingestion upon presentation, a gastrointestinal perforation was not considered as a differential diagnosis. The posteroanterior abdominal X-ray showed no free air under the diaphragm. However, free sub-diaphragmatic air is not frequently observed in gastrointestinal perforations [7]. Goh *et al.* [8] reported that free air under the diaphragm was present in only 15.9% of cases. This can be explained by the fact that once the foreign material perforates the intestinal wall, the consequent inflammatory mass is covered by granulation tissue, intestinal wall, and omentum [9].

The jujube, also called a Chinese date, is the fruit of the Chinese jujube tree. Other fruits, such as apricots, persimmons, and plums, are

other reported causes of small bowel obstruction or perforation [10-12]. Perforation caused by a ingested jujube pit has been rarely reported. A delay in the diagnosis facilitates necrosis of the intervening tissue, which will eventually lead to perforation and/or bowel obstruction secondary to kinking, inflammatory reaction, and/or internal herniation [13, 14]. In the present case, the jujube pit appeared to have caused a small bowel perforation preoperatively.

In recent years, laparoscopy has become another important diagnostic and therapeutic method in the evaluation and treatment of foreign body perforations [15]. Laparoscopy is less invasive than laparotomy and can therefore be a good choice for foreign body removal [16]. Hur *et al.* [17] reported two cases of peritonitis caused by sharp bones perforating the intestinal tract and successful removal of the bones by laparoscopy. The most appropriate surgical intervention is determined according to the anatomical location of the perforation or other clinical pathological findings, such as primary suture of a perforated bowel segment, bowel resection. Antibiotics should also be added to the surgical treatment [18]. Although we preferred open surgery, the laparoscopic approach may also be encouraged in patients with acute conditions and less inflammation because it enables direct assessment of the intraperitoneal cavity.

A detailed history and wisely planned imaging studies are crucial steps in assessment of foreign body ingestion in children. As in the present case, the child may have forgotten or may even be unaware of the condition. Any disturbing examination findings accompanying chronic abdominal discomfort should lead the surgeon to imaging studies in a stepwise fashion, starting with X-rays.

In conclusion, although intestinal obstruction and perforation rarely occur after foreign body ingestion, clinicians should be alert to the possibility of fruit pit ingestion. Even if the patient is asymptomatic, fruit pit ingestion should be suspected in some cases to allow for an accurate diagnosis and rapid evaluation.

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Disclosure of conflict of interest

None.

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