



Case report

Perforation of ileum by unnoticed toothpick ingestion presenting as acute appendicitis: A case report

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ARTICLE INFO

Keywords:

Appendicitis

Foreign body

Toothpick ingestion

Appendectomy

Small bowel

Perforation

ABSTRACT

Introduction: Many distinct pathologic disorders can cause acute abdomen, and it can be challenging for doctors to distinguish between them. Appendicitis and small bowel perforation are two examples. This case is being reported to highlight a rare instance in which acute appendicitis can be mistaken for ileal perforation by sharp solid objects.

Case presentation: We discuss the case of a 9-year-old boy who arrived at our hospital complaining of right iliac fossa abdominal pain that started two days earlier with no other associated symptoms. Physical examination revealed right iliac fossa tenderness and rebound tenderness. The results of the imaging and laboratory tests were inconclusive; therefore, the patient was admitted for observation and further assessment. Re-evaluation 4 h after admission found no clinical improvement, and abdominal examination revealed guarding and rebound tenderness, prompting the surgical team to opt for an appendectomy. During surgery, an elliptical incision was made to remove a sharp foreign body penetrating the ileum.

Discussion: Even during surgery, diagnosing acute appendicitis is difficult. Some cases of small bowel perforation caused by foreign body ingestion have been linked to a clinical picture similar to acute appendicitis, while others present with acute peritoneal signs. This report describes a sealed ileal perforation by a sharp solid object, manifested as acute appendicitis.

Conclusion: Perforation of the small bowel by sharp solid objects may easily be missed on imaging, probably related to their ability to seal off the resulting perforation. A sharp solid object's perforation seems to cause localized tenderness mimicking appendicitis.

1. Introduction

Acute abdominal pain is one of the most common complaints in children, and it can be difficult to diagnose because of the variety of possible underlying causes [1]. A self-limiting benign condition, such as gastroenteritis, causes most cases of acute abdominal pain. Still, it can also result from more severe and life-threatening conditions, such as appendicitis and intussusception [2]. The most frequent pediatric surgical emergency is appendicitis [3]. The risk of developing appendicitis

is 7–8 % over one's lifetime, the incidence of which peaks in adolescence [4]. To reduce morbidity and death, these illnesses must be diagnosed and treated quickly [5]. Clinical assessment remains the primary method of diagnosis of acute appendicitis [6].

Acute abdomen accounts for up to 40 % of emergency admissions to surgical facilities, with gastrointestinal perforation contributing to many of these cases [5]. The perforation usually occurs due to sharp and elongated objects, such as toothpicks, mainly at the points of narrowing in the small intestine [7]. Although foreign body ingestion is a common

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clinical issue in emergency care settings, 80 % to 90 % of ingested foreign bodies pass safely through the gastrointestinal tract [5]. Rarely do persons who swallow foreign bodies need surgery [8]. Here we present a case of a 9-year-old patient with a perforated small bowel secondary to foreign body ingestion. The patient presented with signs and symptoms suggestive of acute appendicitis. His medical history and preoperative workup didn't reveal a history of foreign body ingestion. This manuscript complies with the SCARE criteria [9].

2. Presentation of case

A 9-year-old Arab male was brought to our government hospital by his family with a 2-day history of right iliac fossa pain, dull-aching in nature with no radiation. The pain wasn't associated with nausea, vomiting, change in bowel habits, pyrexia, or urinary symptoms. His past medical and surgical histories were free. No drug history was reported, and family history was insignificant. Physical examination revealed a child with a temperature of 36.8, heart rate of 81, blood pressure of 110\70, and oxygen saturation of 99 % on room air. Clinical examination revealed tenderness over the right iliac fossa, with rebound tenderness. However, it was negative for guarding and blood per rectum. Genitalia was examined and showed no visible scars, and no lumps could be seen in the inguinal region. Laboratory results of CBC, Amylase, Lipase, CRP, and liver function tests were within normal limits. Plain chest and abdominal radiographs revealed no free air under the diaphragm and a nonspecific bowel gas pattern, respectively. An abdominal ultrasound showed a small amount of intra-abdominal free fluid with a non-visualized appendix.

The patient was admitted to the surgical ward for further evaluation and observation. He was kept nil per os and maintained on intravenous fluids and proton pump inhibitors. Four hours afterward, the patient was found to be in severe pain and tenderness localized to the right iliac fossa with guarding and rebound tenderness. Repeat ultrasound showed a non-visualized appendix. However, based on his history and the clinical examination results, a primary diagnosis of acute appendicitis was made without needing further imaging. The patient was adequately prepared for surgery and underwent appendectomy. The surgery was done under general anesthesia and full sterile techniques. Lanz incision and opening of the layers were made. The cecum was identified, and the appendix was found to be subhepatic and grossly appeared normal. Nevertheless, an appendectomy was performed as the surgical team had no clue that another condition might have caused the patient's signs and symptoms. On running of the small bowel, a sharp foreign body, a "Toothpick," was penetrating the ileum at the antimesenteric border 40 cm from the ileocecal valve (Fig. 1). This required an elliptical incision to be made around the foreign body, the affected area to be removed, and then the enterotomy to be closed with interrupted Vicryl 3\0. A warm saline wash was made before drain insertion and closure. Dressing and a nasogastric tube were applied.

The patient made an uneventful post-operative recovery. He was kept on IV metronidazole 300 mg/tid and cefuroxime 300 mg/tid for four days in addition to IV fluids and analgesia. After gradually tolerating oral feeding on day five, he was sent home on amoxicillin 875 mg-potassium clavulanate 125 mg tablet mg/bid for seven days and oral analgesics as needed. Follow-up showed resolution of abdominal findings and recovery to a pre-disease state of general health. Histopathological examination of the resected appendix revealed the presence of *Enterobius vermicularis*. Based on this finding, all family members, along with the patient, were prescribed mebendazole.

In our case, the patient claims to have no recall of ingesting a foreign body. Therefore, it is difficult to tell how long it was between ingestion and the onset of symptoms. The patient was admitted to the hospital with features suggestive of a surgical abdomen for which acute appendicitis was suspected. The patient underwent open appendectomy since the surgical team had a more excellent experience with it. Intraoperatively, the appendix was found to be grossly normal. Accordingly,

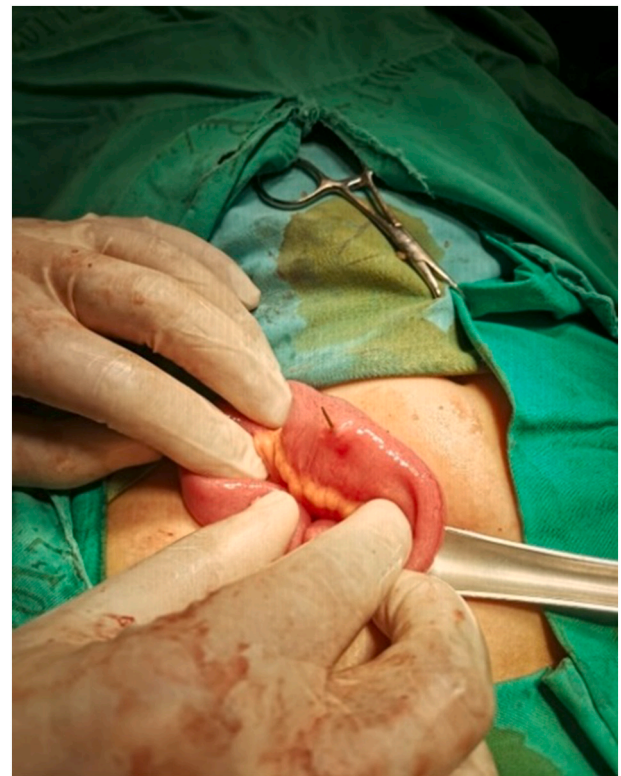


Fig. 1. Toothpick penetrating the antimesenteric border of the small bowel.

running of the small bowel was performed starting from the ileocecal valve. A sharp foreign body, a "Toothpick," was identified 40 cm from the ileocecal valve, and proper management was performed. In this case, the ileal perforation was discovered after an appendectomy. The patient made an uneventful recovery.

3. Discussion

We present a rare case of ileal perforation caused by the unnoticed ingestion of a solid sharp object, a toothpick, which was misdiagnosed as acute appendicitis.

To help diagnose acute appendicitis, several laboratory tests and radiographic examinations are available. However, none are specific to acute appendicitis, and the diagnosis is mainly clinical. Therefore, the diagnosis of acute appendicitis is challenging [6]. Even intraoperatively, diagnosis is difficult, with nearly one-third of seemingly normal appendices inflamed histologically [10]. Therefore, in most cases, when a grossly normal appendix is discovered, with or without a different intraoperative diagnosis to explain the patient's presentation, appendectomy is indicated to prevent the patient from presenting with actual appendicitis in the future [11]. Based on this, an appendectomy was performed despite the fact that the appendix appeared grossly normal, and because no other reasonable explanation was suspected based on the patient's presentation. Following the bowel run, a toothpick-induced ileal perforation was discovered.

It has been reported that foreign bodies' perforation of the small bowel can be misdiagnosed as acute appendicitis [12]. Yao et al. presented a case of acute appendicitis misdiagnosis caused by unnoticed toothpick ingestion [13]. Fishbone has also been linked to small bowel perforation, with a clinical presentation similar to appendicitis [14]. This demonstrates the overlap in clinical presentation between appendicitis and small bowel foreign body perforation. Young age, dementia, mental disabilities, and drinking are all risk factors for foreign body ingestion. However, many ingestions occur in otherwise healthy patients [15]. In our case, the ingested object retrieved after surgery was a

toothpick. The perforation was 40 cm proximal to the ileocecal valve at the antimesenteric border. Perforation can also occur in other areas, such as the rectosigmoid colon and ileocecal region, due to their narrow nature [16].

Frank perforation usually results in severe, diffuse abdominal pain [17]. Swedan et al. found that a 2-year-old child had ileal perforation caused by lollipop stick ingestion, which manifested as acute peritoneal signs and pneumoperitoneum on radiographs [18]. In contrast, the patient in our case presented with tenderness localized to the right iliac fossa and was evaluated with an erect plain chest and abdominal radiographs, which revealed no evidence of pneumoperitoneum. This could be due to the solid nature of toothpicks, which would conceal the resulting perforation, as opposed to the hollow core of lollipop sticks. Furthermore, the pain reported in Swedan's case was diffuse in contrast to the localized nature in our case. It could be because, unlike the flat head of the lollipop stick in Swedan's case, the head of the toothpick's outer end is sharp and thus causing further irritation to the surrounding organs, mimicking the inflammation caused by an inflamed appendix in cases of appendicitis.

There have been case reports of *Enterobius vermicularis* as a cause of appendiceal-related pain in the absence of macroscopic or microscopic evidence of inflammation, such as a case by Efraimidou et al. [19]. However, the presence of ileal perforation by a foreign body in our patient suggests that it is an incidental finding.

4. Conclusion

This case shows that small bowel perforation caused by sharp solid objects can be missed on imaging, likely due to their tendency to conceal the perforation, preventing the development of pneumoperitoneum. Furthermore, the nature of the pain described in our case is essential to note because perforation, in general, is known to cause diffuse peritoneal signs, making it an easier diagnosis than a sealed perforation by a sharp solid object perforation which seems to cause localized tenderness. As a result, the clinical presentation can be similar to other conditions, such as acute appendicitis. Having a low threshold of suspicion is a critical factor in effective management. Furthermore, it is crucial to obtain information on potential incidents of foreign body ingestion and include it in the differential diagnosis of acute appendicitis.

Consent

The patient's parents provided written informed consent to publish this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal upon request.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Ethical approval

Ethical approval is exempt/waived at our institution.

Funding

N/A.

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Registration of research studies

N/A.

Declaration of competing interest

N/A.

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