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## Case Report

# Toothpick—a rare cause of bowel perforation: case report and literature review

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### ABSTRACT

Bowel perforation is an emergency condition. Common causes of bowel perforation include infection, infarction, radiation enteritis, Crohn's disease, and cancer. Ingested foreign body causing bowel perforation is rare. Wooden toothpick-related injuries are uncommon. We report a case of ileal perforation caused by ingested wooden toothpick preoperatively diagnosed by ultrasound and computed tomography.

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## Introduction

Foreign body ingestion is a common cause of medical emergency [1]. Most of the times, foreign bodies can pass safely through the digestive system [2]. However, sharp objectives such as fishbone and toothpick can cause bowel perforation [3–5]. Ingested wooden toothpick is uncommon [6]. This is a potential life-threatening condition and early diagnose is therefore of utmost importance [3]. However, wooden toothpick injury may mimic other conditions and can be misdiagnosed [7]. We present a case of perforation of the ileum caused by a toothpick that was preoperatively detected by ultrasound (US) and computed tomography (CT), and definitively diag-

nosed by surgery. Informed consent has been given by the patient.

## Case report

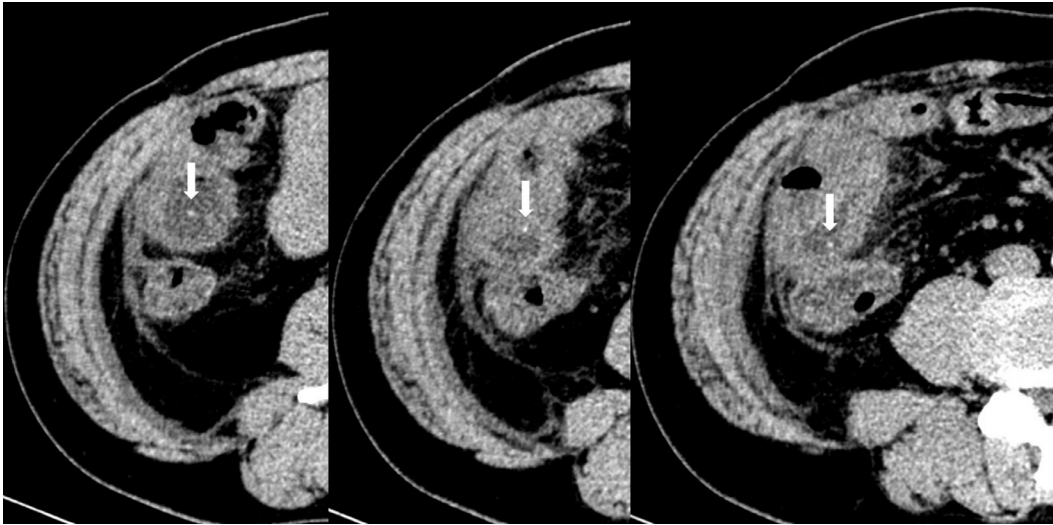
A 55-year-old male was admitted to emergency department with a complaint of right lower quadrant pain for 2 weeks. Physical examination revealed tenderness and guarding sign in right lower quadrant. The patient had mild fever of 38°C. He had no past medical history except for

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**Fig. 1 – Abdominal computed tomography: precontrast images show hyperechoic object within ileal lumen (arrows).**



**Fig. 2 – Small air pocket adjacent to the bowel wall (arrow).**



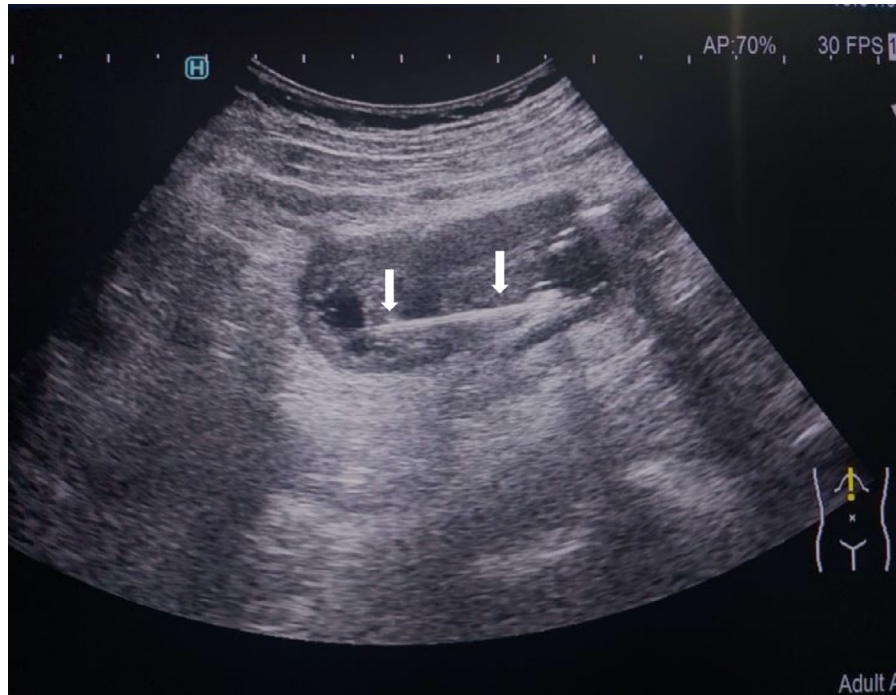
**Fig. 3 – Curved MPR image shows straight line hyperechoic structure within ileal lumen (arrows).**

appendectomy 20 years ago. White blood cell count was  $16,000/\text{mm}^3$ . C-reactive protein was 144 mg/L. Plain abdominal radiography was unremarkable. First sonographic examination was equivocal. Contrast-enhanced CT of the abdomen and pelvis showed a small radiopaque foreign body lodged within the terminal ileum. Edema of the adjacent small bowel loops, small free air pocket, and fluid collection were visible (Figs. 1 and 2). Curved multiplanar reconstruction (MPR) images showed straight line hyperdense structure within the lumen of the distal ileum (Fig. 3). Second-look transabdominal sonographic examination revealed a continuously hyperechoic straight line within the ileum with minimal posterior acoustic shadowing and small area of fat stranding and adjacent small bowel wall thickening (Fig. 4).

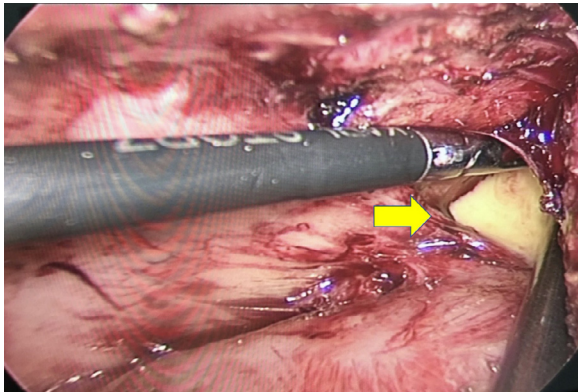
Emergency diagnostic laparoscopy revealed an adhesive inflammatory mass in the right lower quadrant from previous appendectomy and a collection of pus at the latero-posterior border of that mass (Fig. 5). Conversion to open laparotomy due to dense adhesion revealed a wooden toothpick causing perforation of a distal ileal loop (Fig. 6). The toothpick was removed and the injured small bowel loop was resected. The patient recovered well without complication.

## Discussion

Nontraumatic perforation of the gastrointestinal tract has many causes, among which the most common are infection (including tuberculosis), peptic ulcer, radiation enteritis,



**Fig. 4 – Transabdominal US revealed a hyperechoic straight line within the ileum with posterior acoustic shadowing (arrows).**



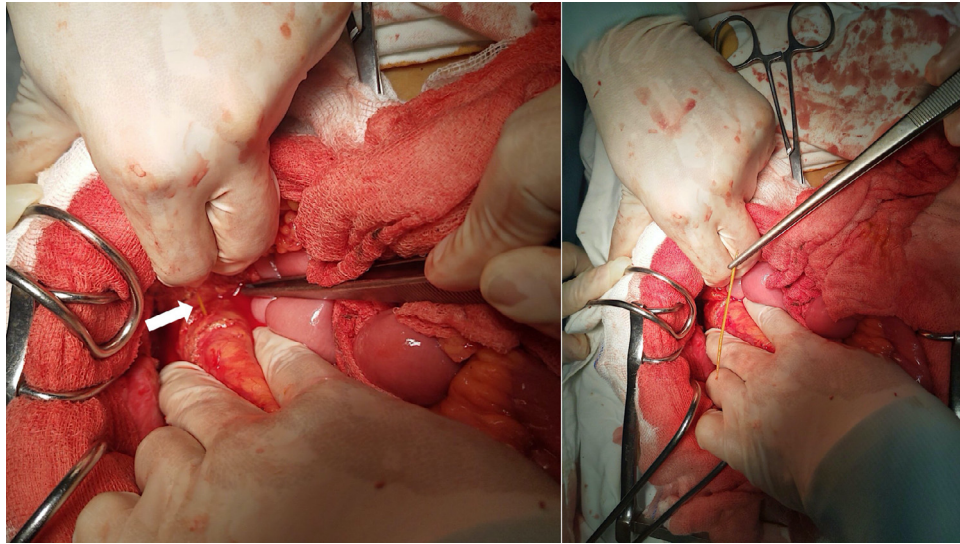
**Fig. 5 – Diagnostic laparoscopy revealed a collection of pus in the right lower quadrant of the abdomens (arrow).**

Crohn's disease, and cancer [8]. In most cases of foreign body ingestions, the objects can pass through gastrointestinal tract uneventfully [2]. Bowel perforation is rare, accounting for only 1% of all cases of foreign bodies ingestion [1]. Estimated incident is approximately 3.6 per 100,000 person-years [6]. Patients are usually children, the elderly, and psychiatric patients [6]. In most cases, the patients do not remember the accident.

Common clinical symptom is abdominal pain (70%). Gastrointestinal bleeding is present in about 7% of patients. Gastrointestinal tract perforation can lead to peritonitis, sepsis, and even death. The mortality rate is around 10%–18% [3,4]. Ingested foreign bodies can cause perforation in any segment of the gastrointestinal tract, with the duodenum and sigmoid colon being the most common sites [9]. Toothpicks' migration to other organs in the abdomen can lead to various clinical conditions, such as liver abscess [10,11].

Definitive diagnosis is based on operative or laparoscopic findings. Imaging techniques including radiography, ultrasound, and CT scan are often indicated for preoperative evaluation of foreign bodies. Abdominal radiography may detect free-air in peritoneal cavity. However, toothpicks may be invisible on radiography due to the nonradiopaque nature of wood [12]. Ultrasound can identify the location of inflamed bowels or abscesses, abdominal free-air, or fluid collection. In some cases, foreign bodies are visible on US as hyperechoic structure with or without posterior acoustic shadow, as in presented case [13]. CT is a highly sensitive imaging technique, allowing detection of foreign bodies and their complications such as perforation, inflammation, and abscess formation. Wooden toothpicks are hyperdense and can be detected on CT. In this scenario, proper windowing and multiplanar reconstruction are important to detect wooden foreign objectives [14].





**Fig. 6 – Abdominal open surgery revealed a wooden toothpick causing perforation of a distal ileal loop.**

## Conclusion

Bowel perforation caused by ingested foreign bodies in general, and toothpicks in particular, is uncommon. However, radiologists should keep in mind these unusual causes in order not to misdiagnose these rare, but potentially life-threatening conditions. Computed tomography with proper windowing is crucial for detecting small objects. US is useful to evaluate in real time the location and status of the foreign bodies.

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