

## CASE REPORT

# Toothpick ingestion and migration into the liver through the colonic hepatic flexure: case presentation, management, and literature review

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### Funding Information

No sources of funding were declared for this study.

Received: 1 August 2017; Accepted: 5 November 2017

*Clinical Case Reports* 2018; 6(1): 192–196

doi: 10.1002/ccr3.1315

## Introduction

Foreign body ingestion is responsible for around 1500 cases of death in the United States every year [1]. It is mainly prevalent in certain high-risk population such as pediatric patients [2–4], elderly patients with dental prosthesis [5], patients with psychiatric disorders or neurodevelopmental delay, and body packers [6–8]. On presentation, one should consider the fact that a foreign body can range from medical devices (needles, surgical instruments especially endoscopic ones etc.) to ingested synthetic foreign bodies or organic ones (animal bones, wooden toothpicks etc.) [9]. Around 136 cases of toothpick ingestion causing gastrointestinal perforation have been reported, of which more than 15 presented with migration into the liver necessitating surgical management [10, 11]. In what follows, we describe the first case of toothpick ingestion, with migration into the liver through the colonic hepatic flexure, how it presented

### Key Clinical Message

The approach to toothpick ingestion and its complications should not be underestimated. The surgeon should be prepared for life-threatening situations such as major vascular involvement, as well as highly specialized and technically challenging procedures, when the hepatic hilum is involved for instance. Referral to tertiary centers is sometimes mandatory.

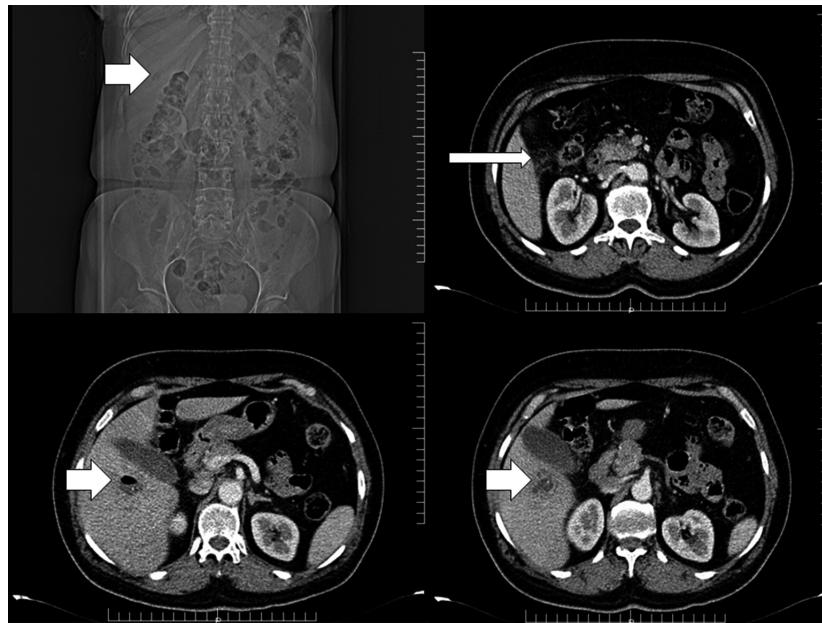
### Keywords

Colonic perforation, surgical management, toothpick ingestion, toothpick migration into the liver.

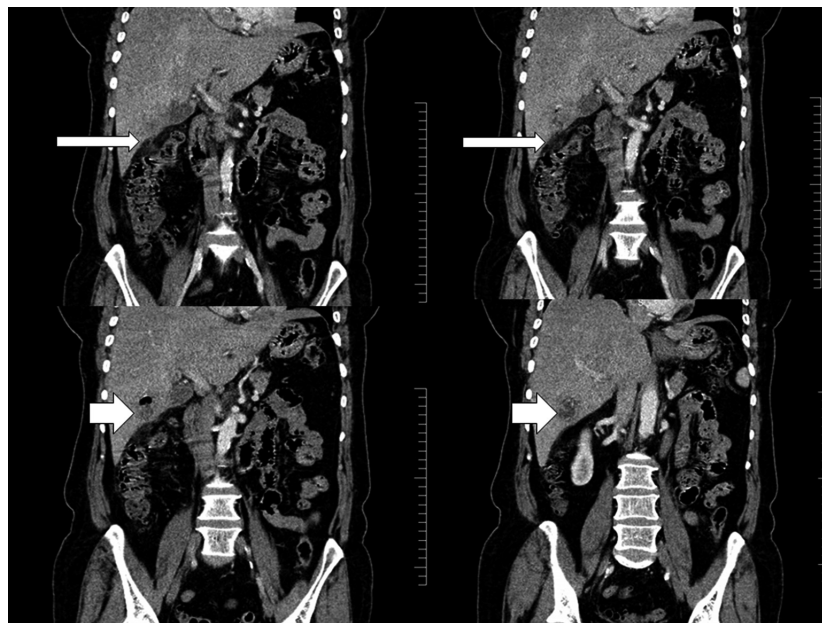
and how it was managed, followed by a brief literature review.

## Case Presentation

This is the case of a 61-year-old female patient, previously healthy, presenting with 2 months history of myalgias, arthralgias, fatigue, and abdominal discomfort. She was febrile 38.8°C, but had no pertinent signs on her physical examination. Blood tests were carried out at first, showing white blood cell of 11,000/ $\mu$ L, neutrophils 70%, C-reactive protein of 198 mg/L. Blood cultures, urine analysis and culture, stools analysis and culture, and chest X-ray were all normal. Widal and Wright tests were negative. An abdominal ultrasound failed to reveal any suspicious findings. CT-scan of the abdomen showed a hepatic lesion in segment V, with air bubbles, measuring 33 mm, corresponding to an abscess with fat stranding around the colonic hepatic flexure, and a possible fistulous tract



**Figure 1.** CT-scan showing the abscess formation in segment V of the liver with an air bubble (thick white arrows) and fat stranding between the colonic hepatic flexure and the liver (thin white arrows).



**Figure 2.** CT-scan showing the abscess (thick white arrows) with coronal cuts showing fat stranding communicating the colonic hepatic flexure all the way to the segment V of the liver reaching the abscess cavity (thin white arrows).

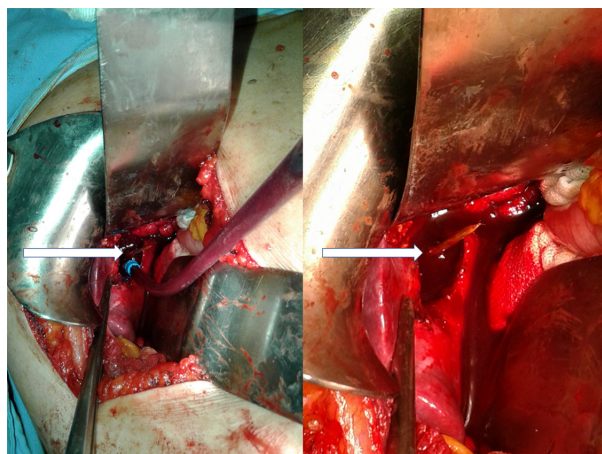
extending inferiorly to the colon (Figs 1 and 2). The presence of a foreign object was also suspected within the abscess cavity. Serologies for *Echinococcus granulosus* and *multilocularis* were negative. After 2 weeks of antibiotics therapy and nonresolving symptoms, an MRI was carried out showing the same cavity now 60-mm long,

with probable communication inferiorly with the colon. At this point, surgical intervention was decided.

Right extended subcostal incision was made. After adhesionolysis, the hepatic flexure of the colon was found adherent to segment V of the liver. Fine dissection was carried out, and liberation of the adherent segment was

performed. An indurated area was noticed at the site of adhesion with a fine wooden tip protruding. Dissection around the foreign object revealed a toothpick embedded in the liver parenchyma (Fig. 3). Wedge resection around it was performed and hemostasis (Fig. 4). Upon reexploration, no overt perforation in the colon was identified, so we decided to put few imbrication sutures along the previously adherent serosa. Two drains were inserted before closure of the abdomen.

The patient was kept NPO for 5 days then diet was resumed. She was discharged on day 7 with no postoperative complications.



**Figure 3.** Hepatic wedge resection around the foreign object that revealed to be a toothpick (white arrows) protruding through liver segment V.



**Figure 4.** Hepatic specimen removed, with the toothpick lodged inside.

## Discussion

Foreign bodies ingestion can sometimes be difficult to diagnose. Patients most commonly present either with bowels obstruction or with complications related to perforation, migration, and intraabdominal fistulas [12]. Patients will report a history of recurrent abdominal pain, fever of unknown origin, like our patient, nausea, obstipation, diarrhea etc. [13–17]. The diagnostic work-up usually consists of EGD, colonoscopy, computed tomography scan, and ultrasound, but failure to detect the toothpick was reported in 35% of the cases. About 58% require surgical intervention with an overall mortality of 9.6% [18]. Around 18 cases of intrahepatic toothpick with abscess formation were reported in the literature, with duodenal perforation as the site of penetration in eight cases, the stomach in 6 cases, the sigmoid colon in one case, and unknown entry site in three cases [11, 14, 19–32].

Steinbach *et al.* demonstrated various therapeutic options with respect to the toothpick location. Endoscopy showed success mainly when the toothpick location was the stomach (75%), duodenum (70%), and large bowels (45%). Laparotomy was necessary in extraintestinal locations (80%), small bowels (75%), large bowels (50%), duodenum (30%), and stomach (25%). The role of laparoscopy was still limited to the extraintestinal and small bowel locations (20%), and large bowels (10%). Accordingly, an algorithm was devised for management, in relation to the toothpick location [18].

Our case is the first reported case of colonic perforation at the level of the hepatic flexure, leading to intrahepatic migration of the ingested toothpick. A high clinical suspicion should be raised whenever atypical abdominal symptoms are present. Long-standing fever with no origin or focus, abdominal pain, obstruction, perforation in young healthy patients etc. The patient's age, mental capabilities, clinical characteristics, and socioeconomic status should also raise questions. The surgeon should be prepared for life-threatening situations such as major vascular involvement [17], as well as highly specialized and technically challenging procedures if the toothpick involves the hepatic hilum for instance [12].

The approach to foreign body ingestion and its complications should not be underestimated as the diagnostic work-up can be highly inconclusive and the surgical intervention extremely challenging. One should not hesitate to differ any potentially complicated case to a tertiary center where diagnostic and therapeutic means are readily available. The surgeon must know his limitations and should assess the situation before intervening. Early diagnosis and extraction are mandatory to improve the prognosis, hence, early referral to tertiary centers sometimes should not be delayed. Advancement in endoscopic,



laparoscopic, and other minimally invasive techniques might preclude the need for an invasive laparotomy. However, it is important to note that in 35% of time the need for laparotomy as an exploratory procedure cannot be ignored.

## Conflict of Interest

The authors declare no potential conflict of interest.

## Authorship

AEA: wrote the article and assisted in the surgical intervention. YP: gathered the clinical data, did the literature review, and assisted in the surgical intervention. IH: consultant surgeon and case supervisor. MK: reviewed the article and underwent the surgical intervention.

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