



Case Report

Trans-colonic foreign body penetration of the retro-hepatic vena cava. Report of a case and review of the literature

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ABSTRACT

Foreign body ingestion is common in mentally impaired adults. Fortunately, the vast majority of all swallowed objects pass through the gastrointestinal tract uneventfully. For patients in whom conservative treatment fails, early endoscopic intervention is required. Surgery is seldom indicated and reports of perforation or penetration of the GI tract are anecdotal. We present a case of a 32 years old mentally impaired patient with a trans-colonic penetration of a foreign body into the retro-hepatic vena cava.

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Introduction

Foreign body ingestion occurs primarily in children, elderly, mentally impaired and psychiatric patients [1–4]. Approximately 80% of ingested foreign bodies pass through the gastrointestinal tract without any sequelae, 10–20% requires endoscopic removal and less than 1% requires surgical intervention [2,3,5,6]. Complications of foreign body ingestion include ulcer formation, lacerations, perforation, intestinal obstruction, aorto-esophageal and tracheo-esophageal fistula formation, and infection [7–12].

We present a case of a severely mentally impaired female with a history of multiple episodes of foreign body ingestions that presented with fever due to a trans-colonic penetration of the retro-hepatic vena cava by an ingested foreign body.

Case report

The patient is a 32 year old female diagnosed with severe psycho-motoric retardation. She is a permanent resident of an institution for chronically debilitated children. She is heavily medicated with psychiatric drugs including carbamazepine, haloperidol, promethazine and clonex due to endless restlessness and previous incidents of foreign body ingestions. Previous events resulted in multiple endoscopic removals and one previous surgical procedure. The patient was admitted to another hospital due to fever of unknown origin. On admission she was tachycardic, restless. Spiking fever up to 40 °C (104 F) was reported. Although physical examination is unreliable due to her restlessness and cognitive impairment the abdomen was soft and non-tender. Laboratory results were all within the normal limits.

Her work up included Chest x-ray that was normal and a computerized tomography (CT) scan of the chest and abdomen. The CT scan identified several foreign bodies within the right colon (Fig. 1a), one of which was penetrating the colon at the hepatic

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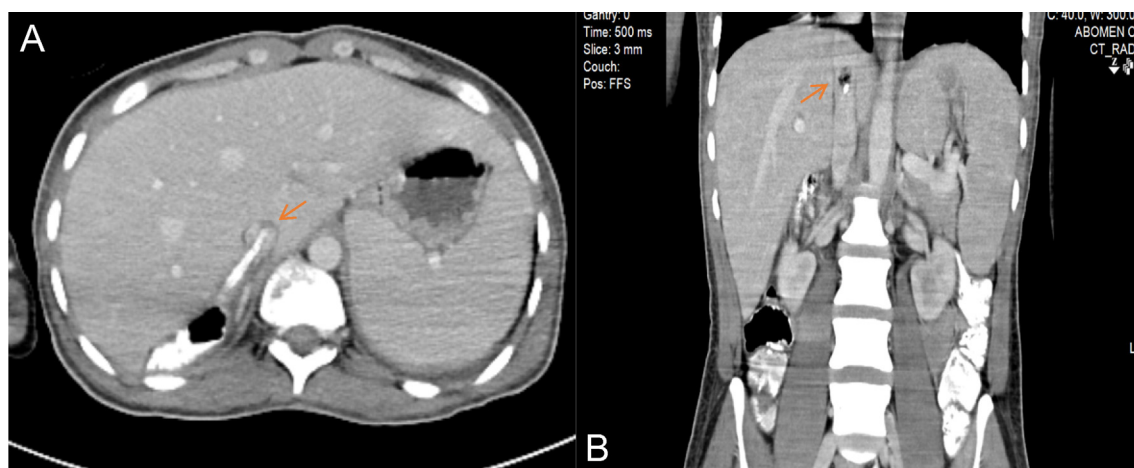


Fig. 1. Foreign body penetrating the lumen of the vena cava (A), vena cava showing intraluminal air in the vicinity of the distal end of the foreign body (B).

flexure that was leaning upon the vena cava. The foreign body penetrated the vena cava resulting in intraluminal air (Fig. 1b). The patient was transferred to our hospital for further treatment. On arrival the patient had spiking fever of 39.5 °C. She was hemodynamically stable. The CT scan was reviewed and surgery was planned accordingly. The patient received fluids and antibiotics, Foley catheter and a nasogastric tube were inserted. During the operation a latero-medial mobilization of the right colon was performed. The foreign body (7 cm wooden tree branch) that penetrated the colon and the inferior vena cava was identified.

The colon was carefully resected leaving the foreign body impaled in the vena cava for further control of the blood vessel before extracting it from the vein. Right hemicolectomy was performed. After removing the colon, the right lobe of the liver was fully mobilized. Full exposure of the retro-hepatic vena cava enabled removal of the foreign bodies under proximal and distal control of the vena cava. The hole in the vena cava was debrided and repaired. Only then primary ileocolic anastomosis followed. Operative course was uneventful. Post-operative course was complicated with recurrent high fevers, blood cultures revealed penicillin resistant enterococcus, staph hemolyticus, *Escherichia coli*, and candida glabrata resistant to fluconazole treated with caspofungin. Due to the persistence of fevers a CT scan of the chest and abdomen was performed and a small collection of fluid in the retro-hepatic region was revealed and drained. Trans-esophageal echocardiography showed no evidence of endocarditis. US Doppler of the vena cava revealed a 2.5 cm thrombus within the retro-hepatic vena cava. A positron emission tomography (PET) CT ruled out infected thrombophlebitis of the vena cava. The patient recovered with IV antibiotics and the rest of her hospitalization was uneventful. She was discharged for follow-up in the outpatient clinic.

Discussion

Gastrointestinal (GI) perforations occur along the GI tract due to acute bowel angles, reduced caliber of bowel lumen, and transition from a relatively mobile (ileum and sigmoid) to fixed (cecum, rectum) portion of the bowel. Toothpick is a relatively intuitive comparison to the wooden tree branch in this case. Chung et al. analyzed the frequency of perforation according to its location in 236 patients. The most common was small bowel with 39.8% followed by duodenum (22%), Colon (20.3%), rectum (10.6%) and sigmoid colon (5.5%) [13]. Complications include pneumo-peritoneum, abscess formation, obstruction and migration to other organs with resulting injury. Cases of migration to the aorta, pericardium, coronary artery, lung, liver, portal vein, hepatoduodenal ligament, inferior vena cava, peritoneum, bladder, retroperitoneum, pancreas, kidney, ureter, perianal space, and hip have all been documented [14]. Although migration to other organs was previously described in the English literature direct penetration and impalement of the retro-hepatic vena cava was anecdotally described [15–21].

Most foreign bodies will pass through uneventfully, but long and pointy foreign bodies such as toothpicks, fish bones, and wood tree branches like in our case are more probable to need surgical or endoscopic removal.

Extraction of these foreign bodies could be either by endoscopic means, or by surgery in a laparoscopic or open approach. Colonic toothpicks are more likely to be extracted surgically [13].

We present a case of intestinal penetration and large vessel impalement by an ingested foreign body and its management. In this case we selected to perform the bowel resection after extracting the foreign body from the bowel in order to gain access and control on the impaled blood vessel.

On one hand timing of surgery and appropriate preparation of the patients are of crucial importance to the successful management. It seems that in most cases the surgical intervention is urgent but not an emergency and allows proper patient preparation. The results of penetrating injury to the retro-hepatic vena cava in trauma settings are poor and the management of such case imposes great risks for operative hemorrhage.

In this case we opted as a first step to mobilize the right colon and remove the colon from the impaled object leaving it within the vena cava, this allowed easy mobilization of the right lobe of the liver and perfect exposure of the retro-hepatic vena cava with proper distal and proximal control to reduce chances of operative blood loss.

In conclusion ingested foreign body causing Intestinal perforation is a rare entity, and cases involving penetration of adjacent organs to the best of our knowledge were anecdotally reported in the English literature. The approach to such complicated injury depends largely on the capabilities of the institution treating the patient and a transfer in a timely manner is imperative. Planning and adequate preparation of the patient is crucial for a successful patient management.

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