



Visual Diagnosis in Emergency Medicine

BONE CAUSING ABDOMINAL GROANS

Pradeep Goyal, MD,*† Sonali Gupta, MD,†‡ and Joshua Sapire, MD*†

*Department of Radiology, St. Vincent's Medical Center, Bridgeport, Connecticut, †The Frank H. Netter MD School of Medicine at Quinnipiac University, North Haven, Connecticut, and ‡Department of Medicine, St. Vincent's Medical Center, Bridgeport, Connecticut
Reprint Address: Pradeep Goyal, MD, Department of Imaging Sciences, URM, 601 Elmwood Avenue, Box 648, Rochester, NY 14642.

Abstract—Gastrointestinal complications secondary to fish bone ingestion are rare, however important to recognize in timely manner to prevent morbidity and mortality. Diagnosis is often challenging in setting of non-specific and variable symptoms and lack of history of fish bone ingestion. Diagnostic imaging particularly computed tomography is crucial for diagnosis. However, emphasis should be given on identifying underlying cause of abdominal complications because fish bone is often missed unless specifically looked for. Identification of fish bone is essential for extraction of the inciting nidus. Emergency physician should be aware of this entity to identify it and triage the patients in timely manner. We describe here cases of sub-capsular liver abscess and acute cholecystitis caused by fish bone ingestion. The fish bone as a cause of these complication was initially missed in emergency. © 2019 Elsevier Inc.

Keywords—liver abscess; acute cholecystitis; fish bone

INTRODUCTION

Gastrointestinal complications secondary to accidental fish bone ingestion are extremely rare. The most common sites of perforation in the gastrointestinal tract secondary to accidental foreign body (FB) ingestion are the stomach and the duodenum (1). Ingestion of a fish bone that penetrated the gastrointestinal tract wall and migrated to the liver and gall bladder is uncommon (2,3). The clinical

diagnosis can be challenging when patients present with non-specific symptoms, long duration of history, and lack of history of ingestion of foreign objects. Computed tomography (CT) scan is particularly valuable in the emergency setting for identifying the ingested fish bone as the cause of an acute abdomen. Herein we describe a case of subcapsular liver abscess and acute cholecystitis caused by ingested fish bone.

CASE PRESENTATION

Case 1

A 68-year-old non-smoker, non-alcoholic male from Brazil presented to the emergency department with dull aching, right upper abdominal pain for the last 1 month. It was associated with generalized malaise, low-grade fever, and intermittent nausea, anorexia, and 10-kg weight loss. The physical examination revealed stable vital signs and epigastric tenderness. Laboratory investigations revealed a hemoglobin level of 11.4 g/dL, leukocytosis at $16 \times 10^9/L$, aspartate aminotransferase of 54 U/L, alanine aminotransferase of 36 U/L, alkaline phosphatase of 52 U/L, total bilirubin of 0.8 mg/dL, and direct bilirubin of 0.1 mg/dL. Contrast-enhanced computed tomography of the abdomen and pelvis demonstrated a sub-capsular liver abscess (Figure 1A) and a small linear radio-opaque structure (yellow arrow, Figure 1B) piercing through the gastric pylorus to the adjacent inferior surface of liver capsule, likely an ingested fish bone acting as nidus for infection. To drain the sub-capsular abscess, a percutaneous drainage

Patient consent was obtained for publication.

RECEIVED: 4 April 2019; FINAL SUBMISSION RECEIVED: 5 June 2019;
ACCEPTED: 15 June 2019

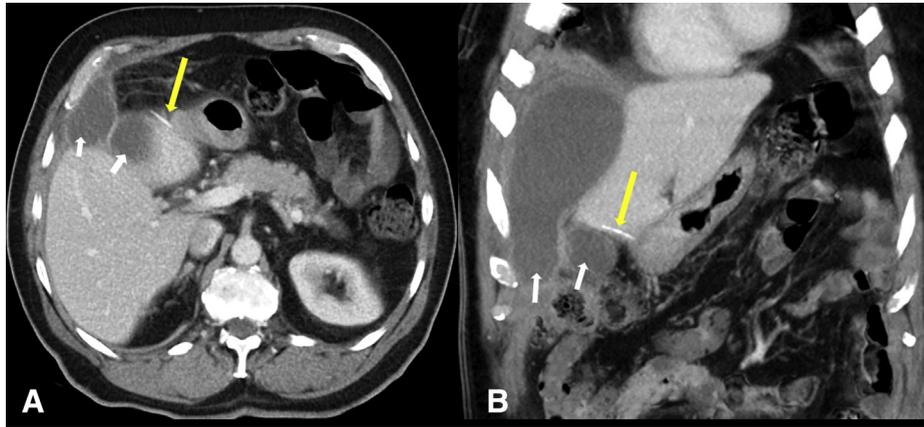


Figure 1. Contrast-enhanced computed tomography scan of the abdomen and pelvis demonstrating sub-capsular liver abscess (white arrows; A, B) and a small linear radio-opaque structure (yellow arrows; A, B) piercing through the gastric pylorus to the adjacent inferior surface of liver capsule, likely an ingested fish bone acting as nidus for infection.

catheter was placed by an interventional radiologist under CT guidance. The culture obtained grew *Streptococcus intermedius* and appropriate antibiotics were started. A 1-month follow-up CT of the abdomen and pelvis demonstrated interval resolution of the previously noted sub-capsular liver abscess with trace residual sub-capsular fluid/capsular thickening, but the ingested fish bone remained in place. Upper gastrointestinal endoscopy was recommended for possible removal, however, the patient was lost to follow-up.

Case 2

A 56-year-old Caribbean man presented with a 2-week history of dull aching, continuous, right upper quadrant abdominal pain, which worsened over the previous 2 days. He had fever of 101°C and heart rate of 96 beats/min. Respiratory rate and blood pressure were within the normal range. He denied nausea, vomiting, melena, or change in bowel habits. He had no other significant medical history. The physical examination revealed right upper quadrant abdominal tenderness and generalized abdominal distension. There was no guarding, rigidity, or presence of mass or free fluid in abdomen. Laboratory findings revealed a white blood cell count of $21 \times 10^9/L$ with left shift. Other laboratory findings were within normal limits. A CT of the abdomen and pelvis (Figure 2) demonstrated thickened and enhancing gall bladder wall with pericholecystic fluid consistent with acute cholecystitis and a small linear radio-opaque structure (yellow arrow) piercing through liver parenchyma adjacent to the first part of the duodenum and extending to the gall bladder, which was likely an ingested fish bone acting as nidus for infection. On further questioning, he did not remember eating a fish bone in the past. A robotic cholecystectomy was performed and confirmed that

a fish bone may have penetrated the duodenal wall and into the gallbladder without causing overt peritonitis. The patient had an uneventful postoperative course and was discharged 3 days after the procedure.

DISCUSSION

Accidental ingestion of FBs, a common clinical situation in children and cognitively impaired adults, is reported rarely in healthy adults. A fish bone is one of the most common accidentally ingested FBs and is often ignored, but is associated with important health implications (4).

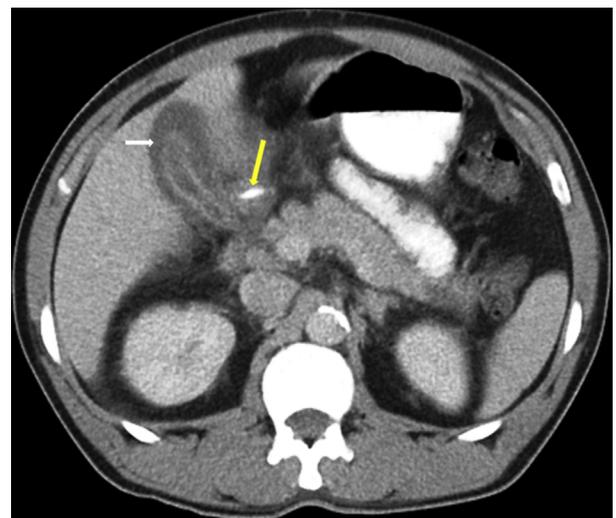


Figure 2. Contrast enhanced computed tomography of the abdomen and pelvis (Figure 2) demonstrating thickened and enhancing gall bladder wall with pericholecystic fluid (white arrow) consistent with acute cholecystitis and a small linear radio-opaque structure (yellow arrow) piercing through liver parenchyma adjacent to first part of the duodenum and extending to the gall bladder, likely an ingested fish bone acting as nidus for infection.

In most cases, it can pass through the gastrointestinal tract without causing any symptoms, or remain silent for long time and discovered only when associated with infection. Usually, no history of FB ingestion is elicited in the majority of the cases, which, along with the non-specific presentation, often delays the diagnosis. Fish bone ingestion is especially common in east Asian cultures where the entire fish is often prepared and consumed with the bones and is considered a delicacy, however, our patients were not from Asian countries (5). The most important risk factor for fish bone ingestion is the use of dentures, but in our cases the likely risk factor was rapid eating under the influence of alcohol.

Diagnostic imaging is particularly helpful in these circumstances when fish bone is incidentally identified as the source of the infection. Usually large radio-opaque FBs can be identified on plain radiograph of the abdomen; however, it is difficult to appreciate a fish bone on plain radiograph due to small size and linear shape. Suspicion of fish bone ingestion should be raised if a linear sharp, pointed, or elongated radio-opaque FB, usually piercing through the wall of gastrointestinal tract in the areas of angulation or narrowing, such as pylorus and terminal ileum, is found on CT scan. Presence of surrounding inflammatory changes at the site of FB is usually suggestive of underlying infection. Fish bone can be seen on CT scan only if looking specifically for a source of infection, as in both of our cases, the small fish bone was overlooked initially (6). However, when no source of infection was

found and images were reviewed again carefully, a fish bone was seen as a likely source of underlying infection.

CONCLUSIONS

The possibility of FBs as the cause of acute abdomen must be considered, even in healthy adults, when they present with non-specific gastrointestinal symptoms, as a missed diagnosis can be fatal. The incidence rates of fish bone-induced liver abscess or cholecystitis are rare, however, it is important for emergency physician and radiologist to be well aware of this entity, to identify them early, and triage them for appropriate treatment.

REFERENCES

1. Kumar S, Gupta NM. Foreign bodies migrating from gut to liver. *Indian J Gastroenterol* 2000;19:42.
2. Goh BK, Yong WS, Yeo AW. Pancreatic and hepatic abscess secondary to fish bone perforation of the duodenum. *Dig Dis Sci* 2005;50:1103–6.
3. Kunizaki M, Kusano H, Azuma K, et al. Cholecystitis caused by a fish bone. *Am J Surg* 2009;198:e20–2.
4. Masoodi I, Alsayari K, Al Mohaimeed K, et al. Fish bone migration: an unusual cause of liver abscess. *BMJ Case Rep* 2012;2012.bcr0920114838.
5. Liew CJ, Poh AC, Tan TY. Finding Nemo: imaging findings, pitfalls, and complications of ingested fish bones in the alimentary canal. *Emerg Radiol* 2013;20:311–22.
6. Goh BK, Tan YM, Lin SE, et al. CT in the preoperative diagnosis of fish bone perforation of the gastrointestinal tract. *AJR Am J Roentgenol* 2006;187:710–4.