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Recurrent Liver Abscess Secondary to Ingested Fish Bone Migration: Report of a Case

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Abstract
Pyogenic liver abscess is an unusual cause of fever and abdominal pain, but it is potentially fatal. It is rarely caused by a local event, but rather by hematogenous dissemination or biliary tract disease. We report an uncommon case of liver abscess caused by the migration of a fish bone through the gastrointestinal wall.

Key words Foreign body · Fish bone · Duodenal wall perforation · Liver abscess · Computed tomography

Introduction

Liver abscess is a cause of febrile abdominal pain. The three classic origins of pyogenic liver abscess are the biliary tract (40%); the portal system, including appendicitis or colitis (15%–20%); and hematological diffusion (5%–15%).[1–4] On the other hand, local causes of liver abscess are very rare.

Technological advances have enhanced the role of imaging in the detection, characterization, and management of infectious diseases involving the liver. Early diagnosis and imaging-guided percutaneous drainage have reduced mortality rates, from 40% to 2%, and the need for surgery.[5,6] Computed tomography (CT) is currently the best imaging modality used to diagnose and determine the cause of a suspected pyogenic liver abscess. We describe an uncommon local cause of liver abscess: the migration of a fish bone through the duodenum.

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Case Report

A 64-year-old man, a native of Guadeloupe, was admitted to our intensive care unit for management of septic shock about 4 weeks after he had received medical treatment for a liver abscess of unknown origin. Diarrhea, nonbloody emesis, pain in the right upper quadrant, and fever developed over the next few days. Physical examination revealed tachycardia (135 beats/min), hypotension (59/41 mmHg), and hyperthermia (40.3°C). Blood tests showed an elevated C-reactive protein (CRP) value of 345.6 mg/l (normal, <2.5 mg/l), and a high serum level of glutamic pyruvic transaminase of 101 U/l (normal range, 30–45 U/l). The leukocyte count was normal and blood cultures were all sterile. Contrast-enhanced CT-scan (Sensation 16, Siemens, Erlangen, Germany) showed a heterogenic, ill-defined, low-density mass in hepatic segment V, containing gas and characterized by peripheral contrast enhancement. These findings were suggestive of a liver abscess. Initially, we thought that a linear hyperattenuating element near the abscess was a blood vessel (Fig. 1, black arrow). The abscess was drained using an ultrasound (US)-guided procedure, and the patient was given antibiotic treatment, which resulted in clinicobiological improvement. Bacteriological culture of the drainage fluid revealed *Streptococcus* sp. in the abscess. Because the patient was still febrile 7 days later, an abdominal US was done, which showed an irregular hypoechoic heterogenic zone in hepatic segment V, suggestive of a recurrence of the abscess (Fig. 2). We performed open surgical drainage, cholecystectomy, and exploration of the abdominal cavity to look for a digestive cause of the recurrent abscesses. No digestive cause was found, but the surgical drainage resulted in clinical and biological improvement. A CT-scan control gave better visualization of the linear hyperattenuating structure at the junction of hepatic segments IV and V. This structure was suggestive of a foreign body (Fig. 3).

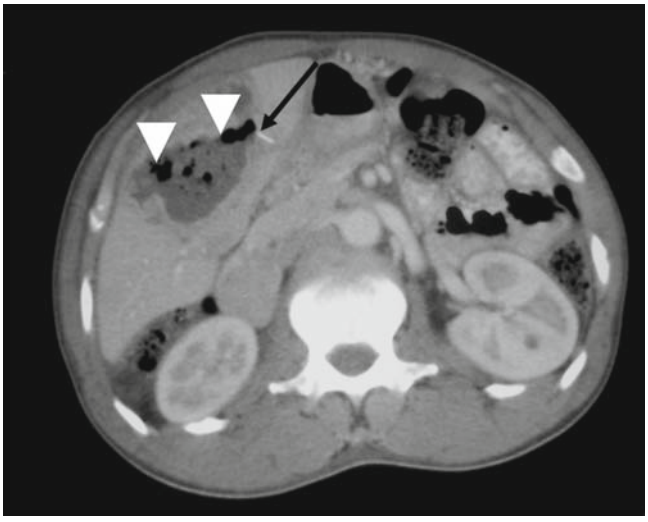

Fig. 1. Hepatic contrast-enhanced computed tomography (CT) scan obtained at the level of the origin of the right renal artery. A 5×3-cm heterogenic mass containing gas (*white arrowheads*) and fluid with peripheral enhancement was seen in hepatic segment V, corresponding to a pyogenic abscess. Linear density near the abscess, initially thought to be a blood vessel, was confirmed later to be a fish bone (*black arrow*)

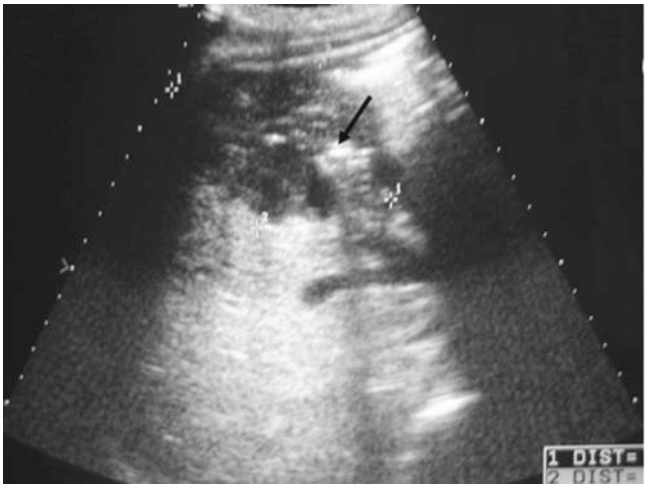

Fig. 2. Hepatic ultrasonography 3 days later showed a hypoechoic heterogenic mass in hepatic segment V. A linear hyperechoic structure on the left side of the abscess (*arrow*) with acoustic shadowing, corresponding to the fish bone. Bright echo reflectors with an associated "ring-down" artifact in the posterior portion of the abscess, corresponding to gas

During a discussion with the patient, he recalled having eaten "fish balls," a typical Caribbean food, several weeks earlier. Thus, we concluded that the liver abscess had been caused by a fish bone, which had probably penetrated and migrated from the duodenum into the liver.

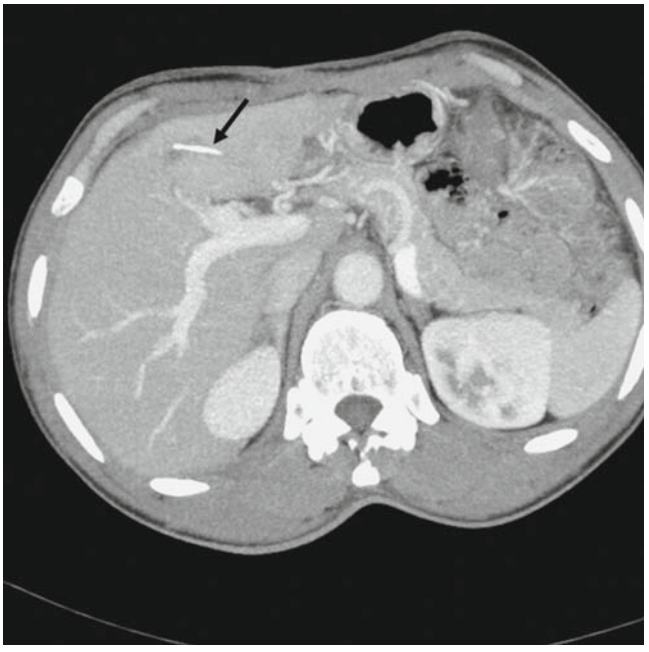

Fig. 3. Hepatic contrast-enhanced computed tomography (CT) scan in axial maximum intensity projection reconstruction done 2 months after surgical drainage of the abscess showing a linear calcified hyperdensity at the junction of hepatic segments IV and V, corresponding to the migrated fish bone (*arrow*)

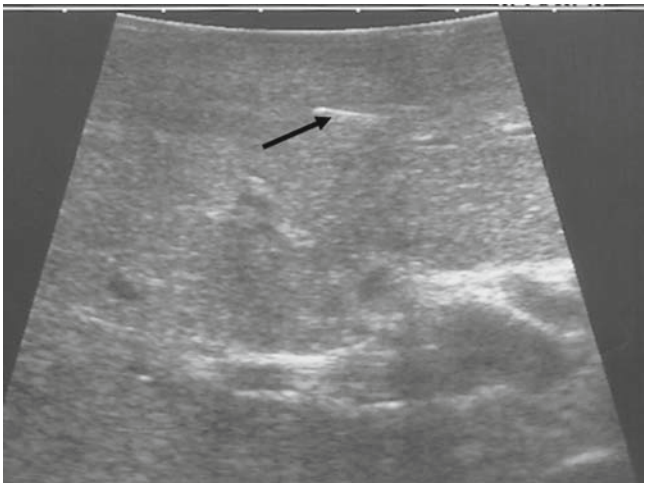

Fig. 4. Intraoperative ultrasonography helped to localize the ingested fish bone (*arrow*) allowing us to decide on the most appropriate site for hepatotomy

A few weeks later, the patient complained of recurrent abdominal pain, so we decided to remove the foreign body by performing hepatotomy under US guidance (Fig. 4). The foreign body was a 2.3-cm fish bone (Fig. 5). The patient had an uneventful postoperative course and was discharged 5 days after this operation. He remains in good health 3 months later.

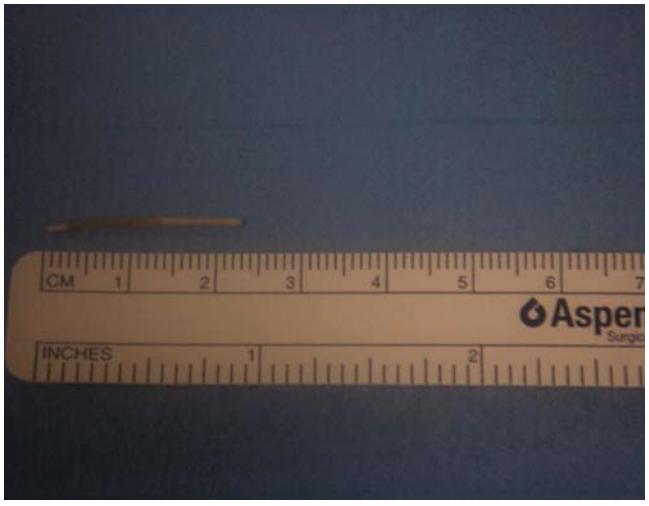

Fig. 5. Postoperative photograph showing the extracted foreign body, which was white and 23 mm long, corresponding to a fish bone

Discussion

Pyogenic abscesses, especially when there are several at a time, may be caused by hematogenous dissemination (of either a gastrointestinal infection via the portal vein or disseminated sepsis via the hepatic artery), ascending cholangitis, or superinfection of necrotic tissue. In the case of a solitary hepatic abscess with no obvious cause, a local source should be considered. The clinical manifestations of pyogenic abscess are varied. Some patients present with the classic symptoms of fever, severe right-sided abdominal pain, and jaundice, which is almost always associated with cholangitis. However, most have nonspecific symptoms and may have clinically occult abscesses that manifest only as anorexia, vomiting, weight loss, and vague abdominal pain. Hepatic biochemical abnormalities are non-specific, and include leukocytosis, increased transaminases, bilirubin, or alkaline phosphatase. Radiography may not detect intra-abdominal abscesses, but ultrasonography and CT have good sensitivity and specificity.[7,8] The ultrasonographic appearance of hepatic abscesses ranges from hypoechoic to hyperechoic, with varying degrees of internal echoes and debris. On contrast-enhanced CT scan, large abscesses are generally well defined and hypoattenuating: they may be unilocular with smooth margins or complex with internal septa and an irregular contour. Computed tomography is particularly helpful for revealing the presence of calcifications and gas, and for detailing the enhancement pattern, especially of the rim. *Escherichia coli* is the most common bacterium found in pyogenic liver abscesses, but other anaerobic and aerobic organisms may be involved. Most liver abscesses are polymicrobic.

There are few documented cases of a fish bone causing liver abscess.[9–13] Fish balls are a typical food in countries around the Mediterranean area, South-East Asia, the Caribbean, the Pacific islands, and Africa. We based our diagnosis on the linear aspect of the foreign body on CT and US, and the clinical history of fish ball ingestion. Other ingested penetrating foreign bodies, such as chicken bones, wooden clothespins, or toothpicks, may cause liver abscesses secondary to gastrointestinal wall penetration[14–16] Lambert reported the first case of a hepatic abscess secondary to migration of a foreign body through the gastrointestinal wall in 1898.[17] Most patients do not remember having swallowed the foreign body, which makes diagnosis difficult.[16]

Plain radiography is not reliable for detecting an ingested fish bone as the radiopacity of the fish bone depends on the species of the fish.[18,19] In fact, plain radiography has only a 32% sensitivity for detecting an ingested fish bone.[20] Computed tomography is more helpful because it shows a linear hyperattenuating structure with calcic tonality corresponding to the bone.[2,10] We think that the fish bone was not detected on the initial CT scan in our patient because of its oblique position in relation to the orientation of the axial CT slices. It was seen more clearly on the CT scan control because it had a horizontal position after abscess drainage. Maximum intensity projection (MIP) on the first CT scan would probably have allowed better visualization of the fish bone.

The most likely mechanism to explain the fish bone in the liver is penetration through the wall of the first portion of the duodenum, and then migration from the posterior surface of the liver into the liver.[21,22] Most foreign bodies pass through the gastrointestinal wall within 7 days,[23,24] but gastrointestinal perforation is rare, occurring in fewer than 1% of cases.[16,25] Moreover, *Streptococcus* sp., which is normal mouth flora, was found in the abscess and probably acquired during passage through the oral cavity.

The treatment of liver abscess caused by a fish bone consists of drainage, ablation of the foreign body, and antibiotic treatment. Removal of the fish bone is the best way to prevent recurrence of the pyogenic abscess. Theoretically, the best time to extract the fish bone is when the abscess has collected. After abscess drainage, delayed removal of the fish bone becomes problematic because it is difficult to pinpoint the exact location of a small foreign body. In our patient, the foreign body was surgically removed 3 months after initial drainage. The fish bone was not removed initially for several reasons: its existence was not suspected preoperatively, the foreign body was not located inside the abscess, and inflammatory changes of the liver parenchyma occurred around the abscess, masking the calcified structure. Surgical fish bone extraction was delayed, but finally made

possible through a short and targeted hepatotomy under US guidance. Liver abscess secondary to fish bone ingestion may also be treated without laparotomy, by a percutaneous transhepatic approach. This technique consists of inserting endoscopic forceps into the sinus tract, under ultrasonographic guidance and fluoroscopy, to ablate the foreign body from the liver.[26]

In conclusion, a fish bone should be considered as a possible cause of recurrent liver abscess when biliary tract origin and portal origin have been excluded, especially in people such as those inhabiting the Mediterranean area, South-East Asia, the Caribbean, the Pacific islands, and Africa, who eat fish balls. This case report emphasizes the role of US and CT in evaluating local causes of recurrent liver abscess.

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