Case Report

Liver fluke-induced choledocholithiasis with biliary ductal obstruction

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A B S T R A C T

Liver fluke-related biliary disease is rare in the United States, as locally-acquired liver fluke infection is uncommon. Presented here is a case of biliary obstruction secondary to fluke infection in a Burmese immigrant to the United States. Imaging findings are presented using computed tomography, ultrasound, magnetic resonance imaging, and fluoroscopy which revealed severe biliary dilatation resulting from large obstructing stones. The offending parasite was identified via stone analysis following surgical extraction.

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Introduction

Choledocholithiasis is a common cause of abdominal pathology in the United States. The estimated incidence of gallstones is approximately 20% of adults by age 40 and 30% by age 70 with female predominance [1]. Gallstones are routinely diagnosed via ultrasonography with cholecystectomy being a common treatment when cholecystitis occurs in the United States.

Gallstones are typically comprised of cholesterol and/or bilirubin, with pigments generally conferred by hemolytic products [2]. Stone formation due to liver fluke infestation of the biliary tree is rare in the United States, as most of the US climate patterns do not sustain propagation of the organism. Even so, humans are thought to be accidental hosts with sheep and cattle serving as the typical definitive hosts.

Presented here is a rare case of liver fluke-induced biliary obstruction demonstrated via a multi-modality imaging approach.

Case report

A middle-aged female Burmese immigrant presented to a tertiary care hospital with abdominal pain. Prior to presentation, she had been living in the United States for several months.
Using her daughter as a translator, the patient stated that she had been experiencing symptoms intermittently over the course of 7 years prior to presentation. The intermittent pain was localized to the right upper quadrant. Some type of treatment for a parasite had been previously administered in Thailand, but it was unclear as to the exact medical regimen.

A CT of the abdomen of the pelvis was requested (Fig. 1). Severe biliary ductal dilatation was demonstrated with collections of stones observed in the intrahepatic biliary ducts. A follow-up ultrasound confirmed the biliary stones as well as the biliary dilatation (Fig. 2). Upon consultation with the gastroenterology service, magnetic resonance cholangiopancreatography (MRCP) was ordered which localized a large stone within the common bile duct (Fig. 3).

Endoscopic retrograde cholangiopancreatography (Fig. 4) was unsuccessful in retrieving the large stone. The patient underwent laparotomy and hepatojejunostomy to remove the stones. The stones were sectioned, and pathologic analysis of the stones showed characteristics consistent with Fasciola hepatica (Fig. 5). Since no adult flukes were recovered, antiparasitic therapy was not required. Surgery proved to be curative for the patient, and she was discharged after recovering from surgery without complication.

Discussion

Liver fluke disease is uncommon in the United States. The case presented here nicely depicts biliary obstruction by large stones using multiple radiologic modalities, each of which have their own advantages and disadvantages.

Ultrasound is the most common imaging test to assess for acute biliary disease. The primary advantages are the lack of ionizing radiation, low cost, and improved gallbladder evaluation compared to CT. This exam may be limited by body habitus and is less specific for liver pathology. CT, however, requires ionizing radiation and may better define liver pathology, but it may be less sensitive in the detection of smaller stones. MRCP, typically the most expensive method, exhibits high sensitivity in the evaluation of the biliary tree, but MRCP requires more time to image and may not be available in the acute setting.

Liver fluke-related disease is far more common in Latin America and Asia and is commonly attributed to Fasciola hepatica or Clonorchis sinensis, the latter of which exhibit smaller ova than depicted in this case. In the life cycle of Fasciola sp., ova are shed in feces, become embryonated and hatch in water, and infect intermediate hosts such as snails. The organism undergoes multiple additional maturation steps before depositing on aquatic vegetation ingested by mammals. The immature form of the organism then penetrates the intestinal wall and migrates into the liver through the biliary system where the adult form develops and generates new ova.
Radiology Case Reports 14 (2019) 1483–1486

Fig. 3 – An axial T2-weighted MRI of the abdomen (A) demonstrates a large T2 hypointense stone within the common bile duct (black arrow). MRCP (B) depicts multiple stones (black arrow) within dilated intrahepatic bile ducts (white arrow). MRCP, magnetic resonance cholangiopancreatography.

Fig. 4 – A fluoroscopic image acquired during ERCP shows the extent of biliary ductal dilatation (white arrow) with a large filling defect in the common bile duct (black arrow). ERCP, endoscopic retrograde cholangiopancreatography.

Fig. 5 – Photomicrograph of the parasite ova. The bar represents 50 mm.

The life span of the adult fluke in humans is 9-13.5 years with stone formation thought to be facilitated by biliary stasis over time [3]. In keeping with the life cycle of the organism, the ova isolated from the biliary system in this patient could have become embryonated if passed into a water supply through feces.

Fluke-related disease is a major risk factor for cholangiocarcinoma in Asian countries [4]. As such, public health strategies aimed at disease prevention are of great importance in geographically-relevant regions. Common bile duct obstruction secondary to Fasciola hepatica-related disease is uncommon with a total of 19 cases reported according to a 2000 manuscript [5]. The findings presented here are notable to radiologists interpreting exams of immigrants with unusual biliary stone disease, as the suggestion of a parasitic nidus for such findings may guide prompt diagnosis and treatment.

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