

An alien in the gallbladder. A rare case of biliary ascariasis in an Italian emergency department

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Abstract

Ascariasis is a common infection in many developing countries. The prevalence of ascariasis is related to poverty, poor hygienic and sanitary conditions. The adult form of *Ascaris lumbricoides* usually resides in the human intestinal lumen (more frequently in the jejunum and middle ileum) and does not cause symptoms. However, it can occasionally cause severe complications such as intestinal obstruction or perforation peritonitis. Its migration into the biliary tract is not uncommon but gallbladder involvement is very rare. Abdominal ultrasonography is essential to detect the presence of this parasite. In this article, we describe the radiologic findings, clinical manifestations and successful medical treatment of a patient with gallbladder ascariasis diagnosed in an emergency setting.

Introduction

Ascaris lumbricoides (AL) is one of the most common parasitic infections of human gastrointestinal tract.¹ Humans are permanent hosts and they are often asymptomatics. *Ascaris lumbricoides*, which usually resides in the small bowel, may migrate into aberrant sites, overall into the bile duct, causing biliary colic and obstructive jaundice.² *Ascaris lumbricoides* adult worm, typically 15-30 cm long and 3-6 mm thick,² rarely settles in the gallbladder³⁻⁵ due to the anatomical characteristics of the cystic duct which is narrow and tortuous. Anomalous origin of the cystic duct directly from the papilla of Vater⁶ and previous sphincterotomy⁷ facilitate worm invasion into the gallbladder. Pregnant women may be more susceptible due to relaxant effect of hormones on the smooth muscle of the bile ducts.⁸

Ultrasonography (US) is an important non-invasive diagnostic procedure in the work-up of these patients,^{4,9,10} which usually describe a clinical picture suggesting a gallstone disease. It is one of the most used diagnostic tools in the emergency department (ED) because it is safe, not invasive, rapid to perform and, consequently avoids wasting of time for the diagno-

sis and the treatment of several pathological conditions in the ED. Conservative treatment with anthelmintic agents is the first line therapy; no response to medical therapy usually indicates the need for endoscopic or surgical interventions.^{7,10-14}

Case Report

An 88-year-old Italian male was admitted to our ED with a ten-day history of recurrent abdominal pain in the right upper abdomen. He had history of hypertensive disease, benign prostatic hypertrophy, and he had an implanted pacemaker device. He denied previous episodes of gallstone disease, abdominal trauma or previous surgery. He was a farmer living in the rural zone of the suburbs of Rome.

Physical examination revealed tenderness in right hypochondrium. Laboratory tests performed at admission in ED showed: aspartate transaminase 14 U/L, alanine transaminase 11 U/L, alkaline phosphatase 52 U/L, gamma glutamyl transpeptidase 12 U/L, bilirubin total/direct 0.48/0.11 mg/dL, lactate dehydrogenase 364 U/L, lipase 35 U/L, amylase 40 U/L, hemoglobin 11.4 g/dL, white blood cells 10,120/L with 5% eosinophils, platelets 226,000/L and c reactive protein (CRP) 8.4 mg/dL.

An abdominal US showed a thickening of the gallbladder's wall with a vermiform non-shadowing image of flukes (37x23 mm), which showed active motility into its lumen (Figure 1). Electrocardiography and chest X-ray did not showed abnormalities. The proven AL's bowel infection was confirmed by a stool test that revealed the presence of AL's ova. The patient was hospitalized in the ED ward.

To avoid surgical intervention, medical treatment was initially tried as follows: albendazol 400 mg *per os*, intravenous (i.v.) fluids, pantoprazol 40 mg i.v. and ampicillin/sulbactam 1.5 g i.v. every 8 h. Analgesic therapy with ketoprofene 160 mg i.v. was also prescribed. Patient got a relief from symptoms after 3 days of conservative treatment and gallbladder US did not show abnormal images anymore.

Discussion

Ascaris lumbricoides is a common infection in developing countries of world tropical and subtropical regions.¹ Prevalence of ascariasis is related to poverty, malnutrition, low standard of public health and hygiene.¹¹ Globally, 819.0 million people are affected by AL infection; a total 166 countries were classified as potentially endemic, including all countries in Asia, Oceania, Latin America and the

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Caribbean, North Africa and the Middle East and sub-Saharan Africa.¹ Frequently, patients with AL infection are asymptomatic.² Gastrointestinal symptoms are typically related to the mechanical effects of high parasite loads.

Ascaris lumbricoides intestinal infection often results in abdominal pain, anorexia, vomiting, diarrhea and impaired absorption.^{2,4,11,14} Sometimes a bolus of worms causes a small-bowel obstruction especially in children where intestinal lumen is small.¹⁵ Complications including volvulus, gangrene, intestinal perforation massive gastrointestinal bleeding.² Occasionally, worms migrate through the ampulla of Vater into the biliary tree and gallbladder, resulting in bile duct obstruction, obstructive jaundice, single or recurrent cholangitis, colecystitis, empyema, hepatic abscess and pancreatitis.^{4,7,14,16,17}

Ascariasis is considered the second cause of biliary-related symptoms and pancreatitis in endemic regions,² after stone disease. Hepatobiliary ascariasis is more common now than in the past, maybe because of the more frequent use of ultrasonography and endoscopic diagnostic procedures in the clinical practice.^{5,9,11}

Sonographic findings included a non-shadowing, long, echogenic structure in the form of a coil, an echogenic strip with central anechoic tube, an echogenic structure extending across the gallbladder giving it a septate appearance, and characteristic erratic, non-directional, zigzag movements of these echogenic struc-

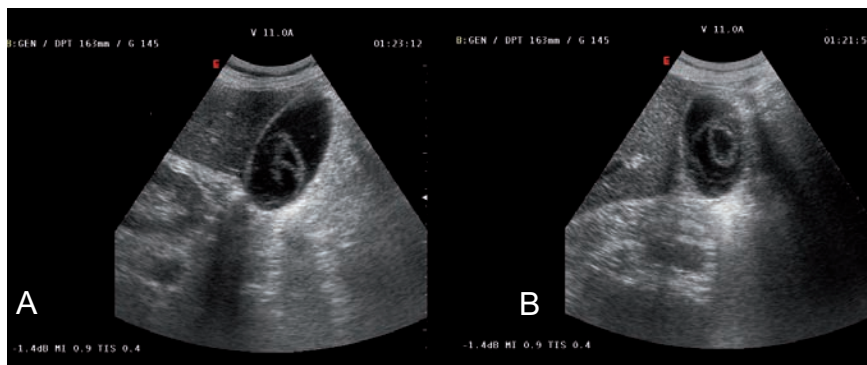


Figure 1. Ultrasonography of the abdomen showing echogenic, tubular, coiling lines inside the lumen of the gallbladder (A) with characteristic erratic, non-directional, zigzag movements (B).

tures in the gallbladder lumen.^{3,4,9,10,18} Computed tomographic scanning^{10,12} and magnetic resonance imaging (MRI)¹⁹ may also be used to identify worm(s) in the liver or bile ducts but this is not usually necessary. Ultrasonography promptly shows worm's movement in the biliary tree and this is an important advantage of US over CT and MRI.^{4,12}

Endoscopic retrograde cholangiograms may be used for the diagnosis of hepatobiliary ascariasis showing a long tubular filling defect in the bile duct or gallbladder and it is useful for therapeutic purposes allowing the direct removal of the worm.⁷ Therefore, the endoscopic procedure should be restricted to those cases in which US is technically inadequate or when it is impossible to obtain a diagnosis.¹⁴ Moreover, it is not used in emergency settings. Several reports exist about the successful medical treatment of gallbladder ascariasis.^{5,8,10,12-14,18,19} Sometimes surgery^{4,6,8,10,16} or the endoscopic procedures^{7,8,10} such as endoscopic retrograde cholangiopancreatographic examination are required. Albendazole and mebendazole are first-line agents for the treatment of ascariasis.²⁰

Conclusions

Although gallbladder ascariasis is more commonly detected in developing tropical and subtropical countries, clinicians need to be aware about this disease because of its possible spreading due to world travel, population migration and climate changing. Ultrasono-

graphy is an important, simple, cheap, safe and reliable and non-invasive diagnostic procedure in the evaluation of the patient with gallbladder ascariasis who usually arrives to ED with a clinical picture suggestive of gallstone disease. Other imaging examinations are rarely needed. Gallbladder ascariasis can be treated medically. Unless an associated disease is present, symptoms persist or a progressive complication arises, the medical treatment should be the first choice before endoscopy or surgery.

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