

Laparoscopic Surgery for Liver Abscess and Cholecystitis Caused by Ascariasis

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Abstract

Intrahepatic and gallbladder ascariasis complicated by liver abscess is an exceptionally rare clinical condition that presents significant diagnostic and therapeutic challenges. The migration of *Ascaris lumbricoides* into the biliary system is uncommon due to the narrow and tortuous anatomy of the cystic duct and intrahepatic bile ducts. When it occurs, it may lead to complications such as acalculous cholecystitis and liver abscess. This case report discussed a case of a 25-year-old male presenting with a one-week history of abdominal pain, fever, diarrhea, vomiting, dehydration, pale appearance, and general weakness. Physical examination revealed decreased skin turgor and tenderness in the right upper abdomen with no palpable hepatosplenomegaly. Abdominal ultrasonography and multi-slice computed tomography (MSCT) showed the presence of liver abscesses and intrahepatic *Ascaris lumbricoides*. The patient underwent laparoscopic cholecystectomy and abscess drainage, followed by metronidazole therapy and supportive treatment. Postoperative ultrasonography on Day 14 showed complete resolution of the infection with no remaining worms. This case underscores the importance of considering biliary ascariasis in patients presenting with non-specific gastrointestinal symptoms. Prompt imaging with USG and MSCT plays a vital role in early diagnosis, while laparoscopic cholecystectomy combined with liver abscess drainage is a safe and effective therapeutic approach.

Keywords: Ascariasis, cholecystitis, laparoscopy, liver abscess

Introduction

Ascaris lumbricoides (*A. lumbricoides*) is one of the most common intestinal helminths worldwide, infecting approximately 1.2 billion people, particularly in tropical and subtropical regions with poor sanitation. Transmission occurs through ingestion of food or water contaminated with infective eggs. Although most infections are asymptomatic, heavy infestations may lead to migration of adult worms into the hepatobiliary system, resulting in biliary ascariasis and a wide spectrum of complications, including biliary colic, cholecystitis, cholangitis, pancreatitis, biliary obstruction, and liver abscess formation. Clinical manifestations vary according to the location of the parasite and

the extent of biliary involvement, and patients may present with nonspecific symptoms such as abdominal pain, jaundice, hepatomegaly, or signs of secondary infection, which can delay diagnosis. Imaging studies play an important role in establishing the diagnosis and identifying associated complications.¹⁻⁵

Biliary ascariasis complicated by concomitant intrahepatic involvement, cholecystitis, and liver abscess is an uncommon clinical entity that presents significant diagnostic and therapeutic challenges. Although most cases can be managed conservatively or endoscopically, surgical intervention may be required in selected patients with complicated disease. Reports describing successful laparoscopic management of this combination of conditions remain limited. Therefore, this report describes a rare case of concomitant intrahepatic and gallbladder ascariasis complicated by cholecystitis and liver abscess that was successfully managed by laparoscopic cholecystectomy and abscess

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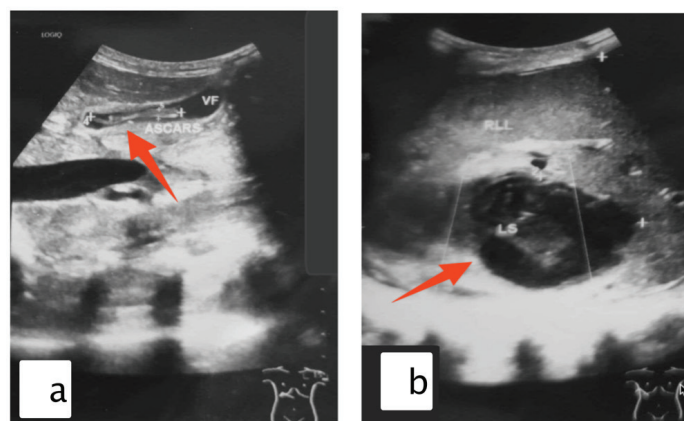


Figure 1 (a) Ultrasonography Showing Worms Within The Gallbladder (b) Ultrasonography Showing A Liver Abscess

drainage, highlighting the diagnostic challenges and the role of minimally invasive surgery in this unusual clinical presentation.

Case

A 25-year-old man presented with a six-month history of intermittent right upper abdominal pain, nausea, and fever. Initial evaluation at a regional hospital included abdominal ultrasonography, which demonstrated worms within the gallbladder (Figure 1A) and a liver abscess (Figure 1B). The patient was subsequently referred to the Digestive Surgery Clinic for further evaluation and management. Despite outpatient follow-up, his symptoms progressively worsened, leading to admission through the emergency department. He was hospitalized for 10 days for comprehensive treatment.

Upon admission, the patient was alert and hemodynamically stable. The patient's vital

signs showed an increased heart and respiratory rates, a slightly higher body temperature, and a normal blood oxygen saturation level (95%). The patient demonstrated clinical manifestations of gallbladder ascariasis, including abdominal pain, fever, and physical examination findings of reduced skin turgor and right-sided abdominal tenderness. Diagnostic chest X-ray revealed right-sided pleural effusion (Figure 2.a.), and MSCT axial, coronal, and sagittal views (Figures 2.b, c and d) revealed liver abscess with pyogenic lesions.

A chest tube was inserted to thread the right pleural effusion. Following stabilization of the patient's respiratory status, laparoscopic cholecystectomy and liver abscess drainage were performed. Intraoperatively, purulent material was drained from the liver abscess cavity (Figure 3A), and worms were identified within the gallbladder (Figures 3B and 3C). Laparoscopic access was established using four ports (ports 1-4), with port 4 also serving for subhepatic

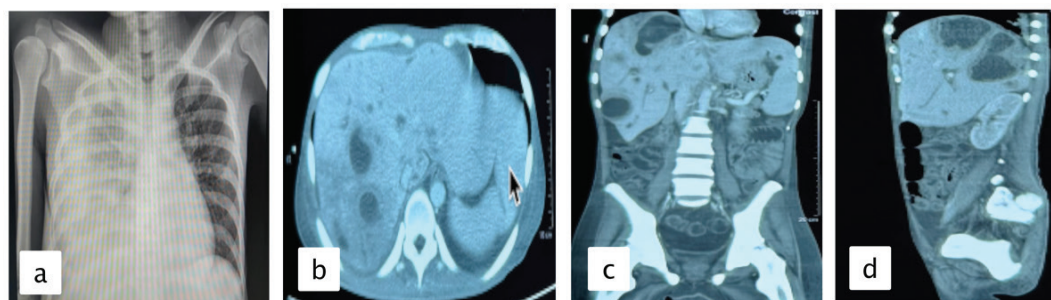


Figure 2 (a) Chest Radiograph Demonstrating Right Pleural Effusion. (b-d) Axial, Coronal, and Sagittal MSCT Images Demonstrating Multiple Hepatic Abscesses



Figure 3 (a) Drainage of the Liver Abscess Showing Pus. (b) Worms within the Gallbladder. (c) Gallbladder Specimen Showing Chronic Inflammation

drain placement (Figure 4). An additional fifth port (port 5) was inserted specifically for liver abscess drainage. The port configuration and the patient's condition at two-week follow-up are shown in Figures A and B, respectively. Intravenous metronidazole was administered during the perioperative period and later continued orally. Supportive treatment was also provided for associated gastroenteritis. Follow-up ultrasonography performed on postoperative day 14 demonstrated resolution of the liver abscess with no evidence of residual ascariasis.

Ethical approval was obtained from the Institutional Review Board of the Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada (Protocol No. KE/FK/1163/EC/2024). Written informed consent was obtained from the patient.

Discussion

This case illustrates the diagnostic and therapeutic challenges posed by the rare simultaneous occurrence of intrahepatic ascariasis, acute cholecystitis, and liver abscess. Ultrasonography and MSCT were instrumental in establishing the diagnosis, identifying worm structures within the gallbladder and intrahepatic biliary system, and delineating the extent of abscess formation. Characteristic USG findings included single, long, linear echogenic structures without acoustic shadowing, consistent with previously described biliary ascariasis imaging features. Additional findings of gallbladder wall edema and intrahepatic abscess formation further guided surgical planning.⁵⁻⁷

The present case is notable for the concomitant presence of intrahepatic worm migration, acute cholecystitis, and multifocal liver abscess formation, a combination that made conservative or endoscopic management insufficient as sole therapy. Previous reports have described successful management of liver abscess secondary to *A. lumbricoides* using antihelminthic therapy alone or USG-guided drainage combined with albendazole or mebendazole.^{8,9} Furthermore, percutaneous drainage combined with antibiotic therapy has also been reported as a viable option in selected cases of liver abscess without surgical

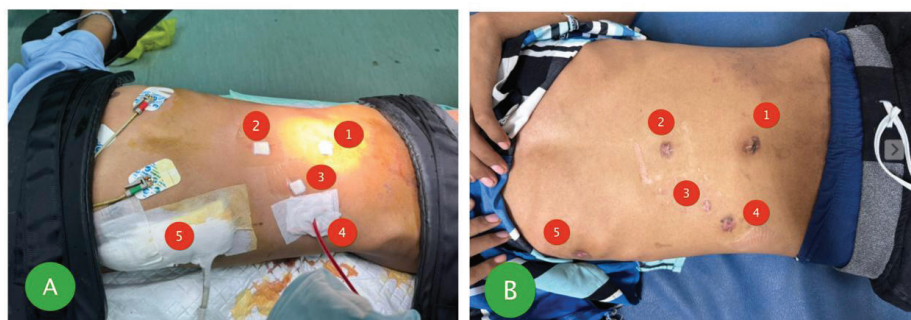


Figure 4 (A) Port Placement During Laparoscopic Cholecystectomy And Liver Abscess Drainage (B) Postoperative Appearance Two Weeks After Surgery Showing Well-Healed Port-Sit Scars

intervention.¹⁰ In contrast, the concomitant gallbladder involvement in our patient necessitated laparoscopic cholecystectomy in addition to liver abscess drainage. Menezes et al. reported a more severe presentation requiring open surgery in the setting of multiorgan dysfunction.¹¹ In the present case, the patient's stable clinical condition allowed a minimally invasive approach with favorable short-term outcomes. These differences in management likely reflect variations in disease severity, worm location, biliary involvement, and abscess characteristics, underscoring the importance of tailoring management strategies to the individual patient's clinical condition and procedural risks.¹²

Postoperative recovery was uneventful, with follow-up ultrasonography at 14 days confirming resolution of abscesses and absence of residual worms. Albendazole was administered after surgical clearance of worms to reduce the risk of complications associated with in-situ worm death.¹³ The successful short-term outcome adds to the accumulating evidence supporting integrated surgical and medical approaches in selected cases of complicated hepatobiliary ascariasis.

This case report has several limitations. As a single case, the findings cannot be generalized to all patients with hepatobiliary ascariasis, and the short follow-up period may be insufficient to detect late recurrence or long-term complications.

In conclusion, the simultaneous occurrence of intrahepatic ascariasis, cholecystitis, and liver abscess represents a rare and complex manifestation of hepatobiliary ascariasis. This case highlights the importance of early imaging evaluation in patients with nonspecific abdominal symptoms, particularly in endemic regions. It suggests that laparoscopic cholecystectomy combined with liver abscess drainage may be a feasible treatment option in selected patients with complicated hepatobiliary ascariasis, especially when gallbladder involvement and multifocal abscess formation are present.

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