

Intrahepatic and extrahepatic biliary ascariasis in a pediatric patient. A case report

Ernesto Julian Carbajal Hernandez M.D.

Ana Rebeca Meza Bosquez M.D.

Clara Lizbeth Giron Muñoz M.D.

Eliel Yair Vizuet Reyes M.D.

Cesar Eduardo Altuzar Martinez M.D.

Puebla, Mexico

Case Report

General Surgery



Background: Biliary ascariasis is an uncommon but serious complication of *Ascaris lumbricoides* infection, particularly in children living in endemic regions.

Case report: We present the case of a previously healthy 9-year-old male patient who was admitted with a two-week history of fever, asthenia, and right upper quadrant abdominal pain. Physical examination revealed abdominal tenderness and hepatomegaly approximately 6 cm below the costal margin. Initial laboratory tests showed marked leukocytosis ($30,290/\text{mm}^3$) and a cholestatic pattern on liver function tests. Abdominal ultrasound revealed dilatation of both intrahepatic and extrahepatic bile ducts, along with an image consistent with parasites in the common bile duct (triple-line sign). Antiparasitic treatment was initiated with albendazole 400 mg/day for three days, followed by piperazine 75 mg/kg/day for two days, resulting in massive expulsion of *Ascaris* worms in the stool. The patient was discharged following favorable clinical and laboratory improvement, with outpatient follow-up arranged.

Conclusion: Biliary ascariasis should be considered in children presenting with abdominal pain and abnormal liver function tests in endemic areas. Timely antiparasitic treatment can prevent complications and the need for surgical intervention.

Keywords: Biliary ascariasis.

Ascaris lumbricoides is the most prevalent intestinal helminth worldwide, with over 800 million people infected, particularly in tropical and subtropical regions with poor sanitation conditions [1,2]. Although most infections are asymptomatic or confined to the gastrointestinal tract, the parasite may occasionally migrate into the biliary tract, causing severe complications such as cholangitis, cholecystitis, pancreatitis, and even hepatic obstruction or perforation [3–5].

Migration into the biliary tree occurs more frequently in children, due to the relatively larger diameter of the common bile duct compared to adults, as well as predisposing immunological factors [6,7]. Clinically, biliary ascariasis may present with right upper quadrant pain, fever, vomiting, and abnormal liver function tests, often showing a cholestatic pattern. However, jaundice may be absent, which complicates clinical diagnosis [4,8].

Abdominal ultrasound is the first-line diagnostic tool, with characteristic findings such as the “triple-line sign” or mobile, tubular, hyperechoic structures within the biliary tract [5,9]. In uncomplicated cases, medical treatment with anthelmintics such as albendazole or piperazine is effective and may prevent the need for invasive procedures. However, in cases with persistent

obstruction, surgical or endoscopic intervention is required—techniques not always available in primary care settings [2,10].

This report presents the case of a pediatric patient with intrahepatic and extrahepatic biliary ascariasis managed in a rural hospital without access to pediatric surgery. Successful treatment was achieved through medical management alone, highlighting the importance of a comprehensive and context-sensitive clinical approach in endemic regions.

Case report

Ascaris lumbricoides is the most prevalent intestinal helminth worldwide, with over 800 million people infected, particularly in tropical and subtropical regions with poor sanitation conditions [1,2]. Although most infections are asymptomatic or confined to the gastrointestinal tract, the parasite may occasionally migrate into the biliary tract, causing severe complications such as cholangitis, cholecystitis, pancreatitis, and even hepatic obstruction or perforation [3–5].

Migration into the biliary tree occurs more frequently in children, due to the relatively larger diameter of the common bile duct compared to adults, as well as predisposing immunological factors [6,7].

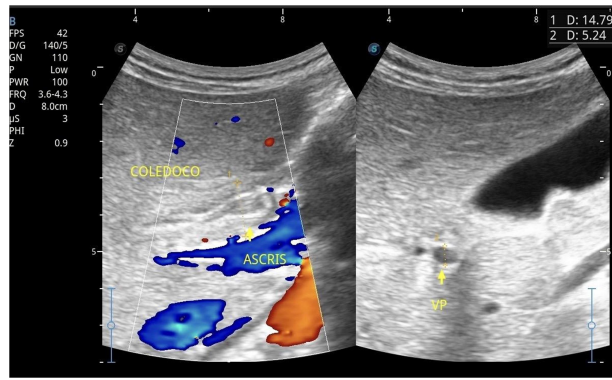


Figure 1. Abdominal ultrasound showing a dilated common bile duct containing a tubular, hyperechoic structure consistent with *Ascaris lumbricoides* (triple-line sign), indicative of biliary ascariasis.

Clinically, biliary ascariasis may present with right upper quadrant pain, fever, vomiting, and abnormal liver function tests, often showing a cholestatic pattern. However, jaundice may be absent, which complicates clinical diagnosis [4,8].

Abdominal ultrasound is the first-line diagnostic tool, with characteristic findings such as the “triple-line sign” or mobile, tubular, hyperechoic structures within the biliary tract [5,9]. In uncomplicated cases, medical treatment with anthelmintics such as albendazole or piperazine is effective and may prevent the need for invasive procedures. However, in cases with persistent obstruction, surgical or endoscopic intervention is required—techniques not always available in primary care settings [2,10].

This report presents the case of a pediatric patient with intrahepatic and extrahepatic biliary ascariasis managed in a rural hospital without access to pediatric surgery. Successful treatment was achieved through medical management alone, highlighting the importance of a comprehensive and context-sensitive clinical approach in endemic regions.

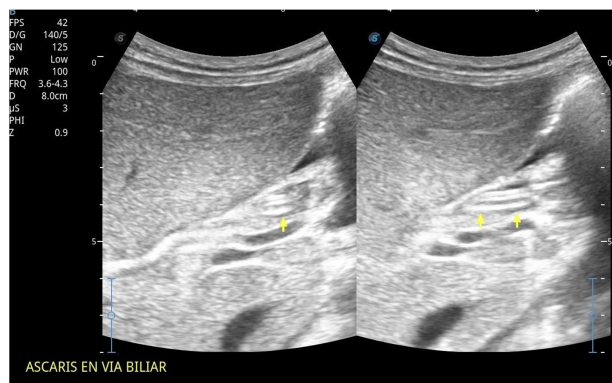


Figure 2. Abdominal ultrasound demonstrating the presence of an *Ascaris lumbricoides* worm within the biliary tract, appearing as a tubular, hyperechoic, consistent with biliary ascariasis.

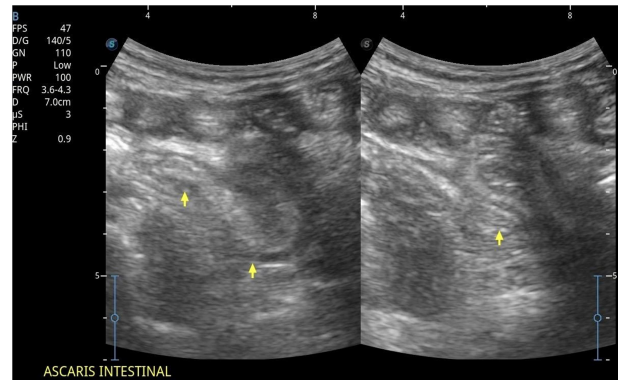


Figure 3 Abdominal ultrasound showing a tubular, hyperechoic, mobile structure consistent with *Ascaris lumbricoides* located within the intestinal lumen.

Discussion

Biliary ascariasis, although infrequent, represents a significant complication of *Ascaris lumbricoides* parasitosis, especially in the pediatric population residing in endemic regions [1–3]. This case highlights the atypical presentation of persistent right upper quadrant abdominal pain without jaundice or overt digestive symptoms, which may have contributed to diagnostic delay—a common scenario in areas with limited access to imaging studies and specialized care [2,4].

The pathophysiology of this condition is related to the active migration of the parasite into the biliary tree, favored in children by the increased diameter of the common bile duct, liquid diet, and a less robust immune response [5,6]. Clinically, the presentation can be acute or subacute, with nonspecific symptoms such as fever, asthenia, and right upper quadrant pain. Jaundice is not always present, as seen in this case, underscoring the need for a high clinical suspicion and the use of ultrasound as a diagnostic tool.



Figure 4 Abdominal ultrasound revealing a tubular, hyperechoic structure consistent with *Ascaris lumbricoides* located within the intrahepatic biliary ducts, indicative of intrahepatic biliary ascariasis

Abdominal ultrasound has a sensitivity of 85–95% in detecting *Ascaris* in the biliary tract, with the characteristic finding being the “triple-line sign,” representing the hyperechoic cuticle of the parasite folded upon itself [4,7]. In this case, this finding was conclusive for diagnosis, enabling timely medical treatment without the need for more invasive procedures such as endoscopic retrograde cholangiopancreatography (ERCP), a technique typically used at secondary or tertiary care levels [8]. Medical management of uncomplicated biliary ascariasis involves the administration of anthelmintics such as albendazole or piperazine, accompanied by antibiotics if there is evidence suggestive of secondary infection, such as the marked leukocytosis presented by this patient [2,9]. The effectiveness of the combined regimen used in this case (albendazole and piperazine), along with monitoring of liver function tests, allowed infection control and promoted parasite expulsion, preventing complications such as cholangitis, hepatic abscess, or the need for surgical intervention [3,9,10].

Moreover, this case highlights structural barriers within the healthcare system in rural settings, where the lack of pediatric surgery availability or timely referral may compromise the outcome of potentially severe clinical presentations. The favorable resolution in this patient, achieved through an integrative clinical approach and rational use of available resources, emphasizes the importance of training primary care personnel in the recognition and management of complicated parasitic infections.

In summary, biliary ascariasis should be considered in the differential diagnosis of any child with persistent abdominal pain in endemic areas, even in the absence of jaundice. Appropriate use of ultrasound and early initiation of antiparasitic treatment may suffice for resolution, avoiding more complex interventions.

Conclusion

Biliary ascariasis, although uncommon, should be considered in children presenting with abdominal pain and liver abnormalities, especially in endemic areas. Ultrasound plays a key role in diagnosis by identifying parasites within the biliary tract. Treatment with antiparasitic agents and antibiotics can be effective without the need for surgery. This case highlights the importance of training primary care personnel in the timely recognition and management of these infections, as well as reinforcing preventive measures such as deworming and hygiene in rural communities.

Conflicts of interests

It is declared that there are no conflicts of interest related to the publication of this work.

Acknowledgements

We thank the surgical and pediatric teams at Rural Hospital of Altamirano, Chiapas for their contributions to the diagnosis and management of this case. Special thanks to the patient for granting permission to share her clinical information for educational purposes.

References

1. de Silva NR, Brooker S, Hotez PJ, Montresor A, Engels D, Savioli L. Soil-transmitted helminth infections: updating the global picture. *Trends Parasitol.* 2003;19(12):547–51.
 2. Silva FS, de Souza MA, Oliveira DRC, Duarte D, Rezende Neto JB. Biliary ascariasis and severe bacterial outcomes: Report of three cases from a pediatric hospital in Brazil. *Int J Infect Dis.* 2020;96:321–4.
 3. Khuroo MS, Zargar SA, Mahajan R. Hepatobiliary and pancreatic ascariasis in India. *Lancet.* 1990;335(8704):1503–6.
 4. Uysal S, Koc Z, Biliary ascariasis in a child presenting with cholangitis: ultrasound findings. *Indian J Pediatr.* 2001;68(1):81–3.
 5. Stojanov D, Stojanovic M, Milenkovic P. Biliary ascariasis in a 6-month-old child. *Hippokratia.* 2015;19(2):179–81.
 6. Dutta A, Baruah A, Biliary ascariasis in children: ultrasonographic diagnosis and management. *J Indian Assoc Pediatr Surg.* 2005;10(2):103–5.
 7. Mahmood T, Mansoor N, Quraishy S. Biliary ascariasis in children. *J Coll Physicians Surg Pak.* 2005;15(11):701–3.
 8. Sarihan H, Ayten A, Kazez A, Karslioglu Y. Biliary ascariasis. A case report. *Turk J Pediatr.* 1995;37(3):281–4.
 9. Kadir MA. Sonographic appearances of biliary ascariasis. *Clin Radiol.* 1993;47(6):435–7.
- Dutta R, Pujari BD. *Ascaris* induced acute pancreatitis in paediatric population – a case series. *J Clin Diagn Res.* 2020;14(12):PD01–PD03.

Ernesto Julián Carbajal Hernandez
Gastrointestinal Surgery Department
Hospital de Especialidades Puebla
Puebla, Mexico.