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ABSTRACT: *Ascaris lumbricoides* is the most common nematode found in the human gastrointestinal tract with a greater prevalence found in developing tropical and subtropical countries. Most cases of ascariasis follow a benign course. In some cases, the adult parasite can invade the biliary or pancreatic ducts and cause obstruction with development of cholecystitis, cholangitis, pancreatitis, and hepatic abscesses.

KEY WORDS: *Ascaris Lumbricoides*, Biliary Ascariasis, Surgery

Case Report

General Surgery



Introduction

Ascaris Lumbricoides is a helminth with dimensions of 15-30 cm x 2-4 mm in males and 20-40 x 3-6 mm in females, which release approximately 240,000 eggs per day, the fertilized ones are ovoid morphology and size 30-40 × 40-60µm, golden brown in color and shows evidence of an embryo. The unfertilized egg elongates from 88 to 95 × 44µm with a thin layer, an irregular outer surface, and poorly differentiated shrink granules on the inside. These worms have a great motor activity thanks to their single layer of longitudinal muscle, their useful life is 6 to 18 months(1), they normally live in the intestinal lumen without causing symptoms, when the population of said parasite increases it can generate symptoms important as intestinal obstruction, and rarely manage to migrate to other areas outside the digestive tract such as the bile ducts(2), in which the parasite manages to migrate through the ampulla of Vater, the parasite can no longer retract to the duodenum. Once the tail enters the bile duct, it is therefore believed that it rarely returns to the intestine (Wang et al., 1956)(3). This is debatable because biliary obstruction is often only temporary(4). The ways in which this helminth can cause pathology in the bile duct are various, the production of B-glucuronidase is hydrolyzed with soluble bilirubin diglucuronide to form insoluble free bilirubin which precipitates as calcium bilirubinate causing the formation of lithos(5). Another mechanism is direct, approximately 65% of patients with ascaris lumbricoides and the presence of biliary colic have demonstrated the presence of the parasite within the bile ducts, which can cause by itself inflammation, the presence of fragments of parasites and Eggs are

usually found in stone formation by 20%. Once dead, these parasites cause damage to the ductal mucosa causing an increase in the production and migration of eosinophils to the bile ducts, precipitating a fibromatous reaction, which is a risk factor for developing stenosis, stone formation, superinfection and cholangitis(5).

Case Report

47-year-old female from and resident of Zitácuaro Michoacán, with a history of Type 2 Diabetes Mellitus controlled with metformin. She began suffering from it 8 days before her admission to hospital presenting abdominal pain in the radiated epigastrium, hypochondrium and right flank, acute of sudden onset, transfictional character and colic type, nausea without reaching vomiting as accompanying symptoms. On physical examination, patient is conscious, oriented, with mild integument pale, cardiopulmonary without apparent ventilatory compromise, ballooning abdomen, distended with pain on mid-palpation in the epigastrium and in the right upper quadrant, positive Murphy's sign, without evidence of peritoneal irritation, peristalsis present, extremities with adequate distal capillary filling. Laboratories report upon admission:

Liver and Pancreatic Function Tests: Amylase 216.0 U / L, Lipase 132.5 U / L, BT: 0.62 mg / dl, BD: 0.28 mg / dl, BI: 0.34 mg / dl, FA: 174.2 U / L, AST: 65 U / L, ALT: 44 U / L, DHL: 537 U / L.

Complete blood cell count: Leukocytes 11,000, Hemoglobin 6.3 g / dl, Hct 23%, Platelets 134,000.

A nasogastric tube is placed which presents gastrobile output of 50 cc, analgesic management is given and decides to take ultrasound of the liver and bile ducts due to the symptoms compatible with a process of obstruction of the biliary tree with reinforcement of the theory with laboratory studies that indicate an obstructive process of the biliary tree with a certain degree of pancreatic inflammation, probably of lithiasic etiology.

Ultrasound reports a gallbladder measuring 8.21 cm x 3.94 cm x 0.49 in thickness, with the presence of bile sludge and a foreign object with apparent movement suggestive of a parasite (**Image 1**).



Image 1. Ultrasound illustration of the gallbladder measuring 8.21 cm long x 3.94 cm wide x 0.49 cm thick, with an apparent parasite indicated in the projections.

Subsequently, eosinophil count studies are carried out in hematic biometry as well as a series 3 coproparasitology to confirm the present parasitic picture. Which are reported positive for Ascariasis with an eosinophil count of 6% of the total leukocyte value 10,700 (**Image 2**).

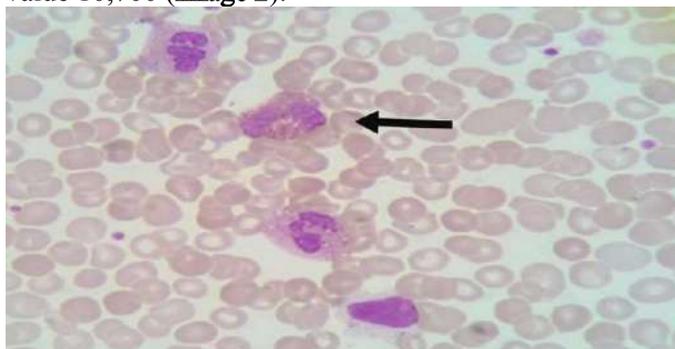


Image 2. Illustration of blood smear with Wright and Giemsa stain. Larger erythrocyte cells, platelets, and leukocyte cells can be seen with the presence of an eosinophil noted in the image

The coproparasitology is reported positive from the first fecal sample, being confirmed in the second taking for which the diagnosis is corroborated with the presence of abundant embryonated eggs of lumbricoides ascaris (**Image 3**).

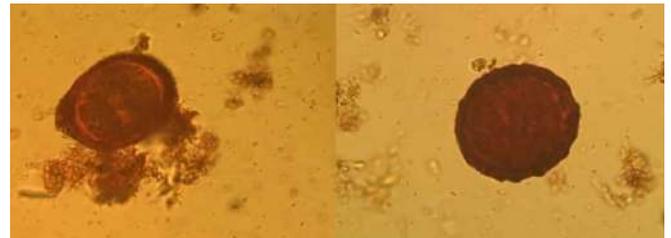


Image 3. Illustration corresponding to embryonated eggs of *Ascaris lumbricoides* with a brown color, by bile dyes, with an inner covering with a lipid layer (ascaroside), which gives selective permeability.

After confirming a parasite in the laboratory, a nasogastric tube is removed with the presence of a 28 cm long ascaris (**Image 4**), an antiparasitic scheme is started with the use of mebendazole as a primary therapeutic measure, avoiding a surgical process, after the administration of antiparasitic patient. refers to the expulsion of large numbers of worms, but without improvement of symptoms with laboratories Amylase 49.4 U / L, Lipase 27.3 U / L, BT: 1.94 mg / dl, BD: 1.73 mg / dl, BI: 0.21 mg / dl, FA: 200.6 U / L, AST: 42 U / L, ALT: 36 U / L, DHL: 415 U / L, Leukocytes 18 700, Hemoglobin 10.1 g / dl, Hct 33.4%, Platelets 264 000.



Image 4. Illustration of a lumbricoid ascaris in a nasogastric tube obstructing the lumen of the tube.

The patient clearly shows improvement in the decrease in pancreatic enzymes, but an increase in symptoms despite an analgesic scheme, and an increase in bilirubin's and alkaline phosphatase, which reflect the increase in biliary tree obstruction, is scheduled patient for open cholecystectomy (due to the lack of a better surgical team in the presumed unit). The patient is prepared with a previous pre-surgical protocol, with a new bile duct ultrasound with the image of the parasite attached to the bile wall still present (**Image 5**).



Image 5. Illustration showing a parasite (*Ascaris lumbricoides*) attached to the wall of the gallbladder after antiparasitic treatment.

With the patient in the ward, an open cholecystectomy was performed without complications in the trans-surgical procedure, obtaining an inflammatory gallbladder without the presence of a parasite inside (**Image 6**).



Image 6. Gallbladder with inflammatory characteristics without the presence of parasitosis demonstrated on ultrasound.

Discussion

The most striking clinical feature of biliary ascariasis is partial extrahepatic biliary obstruction with symptoms of recurrent colic pain in the right upper quadrant, mainly accompanied by vomiting, generally without jaundice and with normal values of bilirubin and serum transaminases,(6) generally demonstrated with ultrasound in more than 50% of cases, once the parasite has been demonstrated through timely detection, it is allowed to start conservative treatment with antiparasitics that usually respond in 23%,(7) however, possible complications must be taken into account, such as obstruction of the bile duct, pancreatitis, cholangitis, empyema and perforation of the gallbladder, gallstones, granulomatosis, liver

abscess, hemobilia, peritonitis, and acute hemorrhagic pancreatitis.(8) Therefore, a review of the follow-up to conservative treatment in 3-6 weeks is recommended. Once conservative treatment fails, there are alternatives such as ERCP if the obstruction symptoms continue. Another option is cholecystectomy with bile duct exploration, which usually shows the presence of parasites.(9)

In this case, an open cholecystectomy was performed and as the presence of the parasite was not demonstrated, the decision was made to perform an exploration of the bile ducts which was not performed due to the systemic conditions of the patient during the trans-surgical period, however in the postoperative period. The patient presented a decrease in symptoms and laboratory values that showed a cholestatic pattern.

Conclusion

The presence of ascaris in the bile ducts demonstrates the possibility of extraction more easily when giving a previous medical treatment, but this does not exempt the possibility of offering an invasive method, the use of ERCP has been accepted and therefore is a therapeutic option. which may be the treatment of choice due to its minimal invasion, but more studies are needed which show the easy removal and the minimal complications that this treatment can offer, since the next surgical option is a bile duct exploration which it can lead to complications in a considerable number of cases.

Conflicts of Interests

The authors declare no conflict of interest.

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Raúl Salvador Carpinteyro Espinoza
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Raul Armando Carpinteyro Espinoza
Department of Surgery
Hospital Regional León, ISSSTE
León, Mexico
raul.carpinteyro23@gmail.com