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Case Report

Massive Hepatobiliary and Pancreatic Ascariasis with Impending Liver Abscesses – A Case Report Analysis

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Abstract

Ascariasis caused by the nematode *Ascaris lumbricoides* is a very common disorder amongst the Asian population and as many as 1.5 to 2 billion people are affected worldwide. Their agility often takes them through different orifices into ducts and cavities. Hepatobiliary and pancreatic ascariasis (HPA) refers to a group of diseases caused by migration of the Ascaris from the intestine into the biliary tree and pancreatic duct through the ampulla of Vater leading to a variety of complications such as biliary colic, gallstone formation, cholecystitis, pyogenic cholangitis, liver abscess and pancreatitis. Ultrasonography (USG) can be quick, safe, noninvasive and relatively inexpensive tool in diagnosing the presence of worms as linear filling defect and also evaluating response to treatment. ERCP is an excellent diagnostic tool for demonstrating the presence of parasites in the biliary tree. Furthermore, ERCP is also used in the therapy of biliary parasitic infestations and carries less morbidity and mortality than the surgical approach. We present a case of a 14 year girl who was diagnosed as a case of massive HPA with impending liver abscesses and responded to conservative management.

Introduction

The roundworm (*Ascaris lumbricoides*) is one of the largest of the parasites that infest the human bowel and is common in regions with poor faecal sanitation, particularly in developing countries in the tropics and subtropics. At any given time, approximately 25% of the world's population is infested with *A. lumbricoides* [1]. Adult roundworms are generally found in the intestine (mainly jejunum). But their agility often takes them through different orifices [2]. In most cases, the nematode moves back into the intestine within 72 hours.

Among the nematodes only *Ascariasis lumbricoides* is able to migrate into the biliary tract. Depending on the position of the nematode, hepatobiliary and pancreatic ascariasis (HPA) has widespread manifestations. Helminthic invasion of the human biliary tract is a prominent medical and surgical problem especially in tropical and subtropical areas where these parasites are endemic [3]. Accordingly, it is important for physicians and surgeons in the temperate areas of the world to be aware of biliary parasites, their clinical picture, diagnosis and treatment.

Case Report

A 14 year old girl presented with multiple episodes of pain upper abdomen and vomiting for last 20 days. Pain was intermittent, colicky in nature and was aggravated on taking food. Vomitus was bilious and also contained worms. Ultrasonography (USG) abdomen revealed dilated common bile duct (CBD) with multiple linear ehogenic shadows (worms) in intrahepatic biliary radicals and CBD (**Fig. 01**). Main pancreatic duct (MPD) also contained a worm. There were multiple small hypoechoic areas in liver suggesting evolving abscesses (**Fig. 02**). Esophagogastroduodenostomy (EGD) showed lots of worms in duodenum (**Fig. 03**). Hemoglobin was 8.9 g/dl, TLC 18,000 /µl with 86% neutrophils and

alkaline phosphatase (ALP) 429 IU/L. Rest of the investigations were within normal limits. Diagnosis of massive hepatobiliary and pancreatic ascariasis (HPA) with evolving liver abscesses was made. Patient was managed conservatively and was put on pyrantel pamoate and proctolysis enema. During hospital stay she passed about 150 worms. After 5 days patient was discharged in stable condition and is on our follow up.

Fig. 01: Showing Dilated Common Bile Duct with Multiple Echogenic Shadows (arrow)

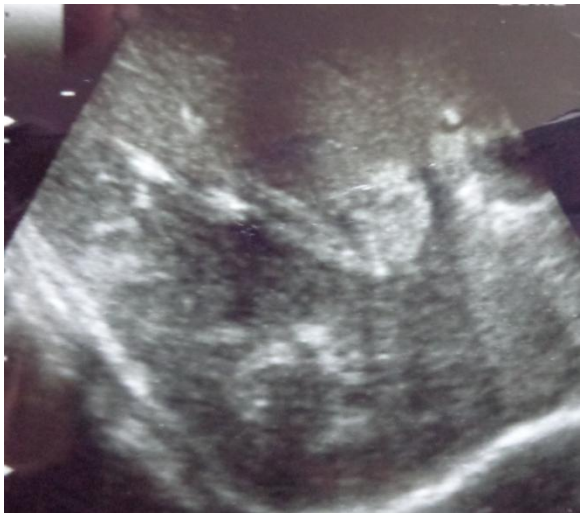

Fig. 02: Evolving Abscess in Liver (arrow)

Fig. 03: Multiple Worms in Duodenum

Discussion

Ascaris lumbricoides is the largest intestinal nematode of humans, measuring 30 to 50 cm in length and 3 to 6 mm in diameter. Humans are infected by eating food contaminated with mature ova. It is estimated that 1 to 1.4 billion people worldwide are affected by ascariasis, making it the most common helminthic diseases in humans [4] and occurs mostly in countries with low standards of public health and personal hygiene, making ascariasis highly endemic in developing countries and is probably second only to gallstones as the cause of acute biliary symptoms. The exact reason for female preponderance is still not clear. Progesterone is a known inhibitor of smooth muscle contraction [5] and is known to significantly increase gall bladder volume and decrease its emptying. Infestation begins with the ingestion of embryonated *A. lumbricoides* eggs. In children, the mode of transmission is typically soil-contaminated hands, fingers, toys, and food. The larvae hatch in the duodenum, penetrate the mucosa of the small bowel, and enter either the portal circulation or small bowel lymphatics migrate through the lungs, ascend the bronchial tree, are swallowed and mature in the small intestine [6].

The vast majority of infected individuals are asymptomatic. In young children, adult worms can aggregate in the ileum and cause partial obstruction because the lumen is small. Various grave consequences can ensue, including intussusception, volvulus, and complete obstruction, leading to bowel infarction and intestinal perforation [7,8]. One of the most serious complications, which may accompany heavy intestinal infestation, is potential migration of the larvae from the jejunum to the biliary track through the sphincter of Oddi. By contrast with

intestinal obstruction, hepatobiliary and pancreatic ascariasis occurs more commonly in adults—especially women—than in children, presumably because the adult biliary tree is large enough to accommodate an adult worm. As a result, patients infected with *Ascaris* can present with biliary colic (56%), tender hepatomegaly (50%), acute cholangitis (24%), acalculous cholecystitis (13%), acute pancreatitis (6%), and occasionally hepatic abscess [7]. In advanced cases with massive biliary ascariasis the patients complain of severe intermittent right upper quadrant abdominal pain and vomiting. Fever accompanied by persistent pain is seen in many patients and suggests the presence of cholangitis and/or pyogenic liver abscess [9]. On examination enlargement of the liver, tenderness and guarding of the right upper quadrant can be found in up to 30% of the cases. Around 10–20% of the patients suffer from jaundice and about 20% of a palpable gallbladder [9,10]. In addition, dead worms or ova may serve as a nidus for the formation of pigment stones, which can lead to recurrent pyogenic cholangitis after the active infection has been treated successfully [11]. Patients with longstanding, untreated recurrent pyogenic cholangitis are at risk for developing secondary biliary cirrhosis.

In diagnosis ultrasound has the advantage of being readily available, inexpensive, and capable of real-time imaging; features include the presence of long echogenic structures, single or multiple, linear or curved structures with or without a central anechoic tube, mostly without an acoustic shadowing [12]. There are specific sonographic features described for Ascariasis in CBD: **'inner tube sign'**- roundworm seen as a thick echogenic stripe with a central anechoic strip, which is the intestinal tract of the worm; **'stripe sign'**—roundworm seen as a non-shadowing stripe without inner tube; and **'spaghetti sign'**—overlapping longitudinal interfaces in the CBD due to coiled single worm or due to multiple worms [13]. In a large retrospective review, ultrasonography correctly diagnosed the presence of worms in 52% of patients [14]. Endoscopic retrograde cholangiopancreatography (ERCP) has also been used successfully to aid in the diagnosis of difficult cases. ERCP is helpful during the active phase and sometimes worms may be seen moving actively into the biliary tree from the duodenum.

The algorithm for patients with a diagnosis of hepatobiliary ascariasis should start with conservative management as the first line of treatment, consists of withholding oral feedings, administration of IV fluids, and anticholinergic and antihelminthic medications [15]. More than 95% of patients with uncomplicated biliary ascariasis respond to conservative treatment [7]. ERCP is the gold standard as it not only visualizes the worms, but may also be used for their extraction from the biliary tree with or without sphincterotomy, which gives immediate relief [16]. However, it must be performed during active symptoms, as the worms may otherwise move back into the duodenum. ERCP has proved to be extremely useful in extracting dead worms from the biliary tree, particularly if they are also associated with calculi in the biliary tree. ERCP extraction has been reported successful in up to 90% of the patients with CBD ascariasis [17].

The indications for surgery are persistent severe right upper quadrant colic and signs of peritonitis or clinical evidence of other complications which cannot be treated endoscopically [7]. As far as patients with gall bladder ascariasis goes, if they expel the worms with conservative management, they have to be followed up regularly, as they may have similar attacks again. Those who improve symptomatically with conservative management, but fail to expel the worms, need to undergo cholecystectomy [18]. All patients diagnosed with *Ascaris* infection should receive antihelminthic therapy. The current treatment of choice is with one of two benzimidazole compounds: albendazole or mebendazole. Single-dose therapy with albendazole, 400 mg, is effective in more than 97% of cases [19].

Conclusion

Helminthic disease manifestations vary from the extremes of asymptomatic carriage to cirrhosis and decompensated liver disease. Biliary ascariasis presents, in most instances, with biliary colic but may present with cholangitis, obstructive jaundice, acute pancreatitis or liver abscess.

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