Biliary Ascariasis as a cause of Obstructive Jaundice in a child

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Abstract
A six year old boy presented with Obstructive Jaundice. On Ultrasonography, there was an Ascariasis worm identified in the common bile duct. Conservative management with a single course of anthelminthics and antispasmodic medication relieved the symptoms of the boy.

Introduction
Ascariasis is a global helminthic problem especially infesting a large number of children in the tropical countries with moist soil and good rain where up to 70% of the children are found to be infected [1].

With the increasing use of ultrasonography and endoscopy, hepatobiliary ascariasis is increasingly recognized [2-4]. Though the disease is diagnosed more often in adults, it is quite a rare entity in children due to the smaller size of the bile duct [5]. Biliary ascariasis carries a good prognosis and responds to conservative therapy with oral anthelminthics. In non-responders endoscopic removal is recommended especially for acute pyogenic cholangitis. Surgical treatment is required for worms in gall bladder or associated complications in children like intestinal obstruction and acute pancreatitis. Long-term effects of biliary ascariasis include recurrent pyogenic cholangitis and rarely formation of liver abscesses. A rare case of choledocho- ascariasis in a child managed successfully conservatively is described.

Case Report
A six year old boy presented with intermittent colicy pain in the right hypochondrium since 10 days. The pain was not associated with fever, vomiting or diarrhoea. There was a past history of recurrent episodes of cholecystitis associated with cholelithiasis for which cholecystectomy had been done six months back. On examination, he had jaundice. Blood investigations showed total bilirubin levels as 3.4mg/dl with direct bilirubin as 2.8mg/dl. The Alkaline phosphatase was 328 IU/ litre. The ultrasound examination demonstrated a worm in the common bile duct as a linear tract hypoechoic centre lined by parallel echogenic outlines (Figure1). He was hospitalized and treated with conservative management comprising of intravenous fluids, antibiotics, antispasmodics and Albendazole. The jaundice and pain disappeared with the passage of the worm into the duodenum. The repeat ultrasonography demonstrated the absence of worms in the common bile duct and he was discharged in 6 days. He was asymptomatic at one year follow up.

Discussion
Ascarias is common in tropical countries with low standards of hygiene, malnutrition, heavy rainfall and where untreated sewage is discharged into rivers, lakes and agricultural land or is used as fertilizer [2]. In children, ascariasis is usually associated with vague abdominal symptoms and can lead to stunted growth, impaired learning, protein-energy and vitamin deficiencies [6-8].

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are mostly infected by ingesting mature ova that can occur through contaminated fingers, toys and soil. Female worms are bigger; approximately 20-40 cm and can produce a large number of eggs daily (~240,000/female) which pass out in the feces [5]. In the soil the fertilized eggs require 10-15 days to become mature and infectious.

Biliary Ascariasis may affect all age groups, the common range being in the middle age group though the extreme range varies between 4-70 years [9]. Surprisingly, a rare case of biliary ascariasis in a 6 month old has been described [10]. It is less common in children who tend to present more with intestinal rather than biliary obstruction partly due to very small caliber of the biliary system in children [11]. A. lumbricoides has a natural inclination to migrate and seek small orifices [12]. Heavy worm infestation or other intestinal infections of viral, bacterial or parasitic origin that can lead to altered gut motility are the usual pre-requisites to reach the duodenum from their natural habitat, jejunum. From the duodenum, it can enter the ampulla of Vater to get lodged in the (a) ampulla (b) common bile duct or (c) hepatic ducts or anywhere in the biliary tree. It can also enter the orifice of the cystic duct and block it. However, it is on very rare occasions that it enters the gallbladder or the pancreatic duct.

Most cases of ascariasis in the hepatobiliary tract present with acute abdomen, biliary colic and jaundice. Complications include acute cholangitis, acute cholecystitis, pyogenic cholangitis, recurrent pyogenic cholangiopathy, hemobilia, common bile duct obstruction and stricture, pancreatitis and liver abscess [13,14]. The diagnosis depends upon demonstrating the worm in the biliary tree. This is not always possible as most often, the worms move in and out of the ducts within 7 days. The diagnostic modalities include:

(a) Blood Examination: Peripheral eosinophilia, due to larval invasion of the blood, is very common.

(b) Ultrasonography is a highly sensitive and specific in visualizing a worm in the biliary system, as well as monitoring its mobility to and from the ducts over time. A worm, which has not changed its position after 10 days in the duct system, is usually a dead and macerated one. The findings of biliary ascariasis on ultrasonography include the presence of long echogenic structures, linear or curved, single or multiple, with or without a central anechoic tube, mostly without acoustic shadowing [15]. An important differential diagnosis is choledocholithiasis, especially since acoustic shadowing may not be seen in about one tenth of common bile duct stones [16-18]. The worms appear commonly as linear, smooth filling defects with or without characteristic movements but without distal acoustic shadowing, and may also be seen as parallel filling defects "Railway tract" sign, curved defects or transverse loops across the ducts [19]. Worms in the gall-bladder appear as long tubular coiled echogenic structure which may be rapidly mobile and is easier to diagnose than biliary ductal ascariasis [20].

(c) Endoscopic retrograde cholangiopancreatography (ERCP) is helpful for diagnostic and therapeutic aspects, especially when the worm is not demonstrated on ultrasonography [21].

(d) Computed tomography (CT) will reveal the worms as cylindrical structures [21]. Occasionally, CT may be used for better visualization of the dilated ductal system.

(e) Magnetic resonance cholangiopancreatography (MRCP) can help to outline the worm in the ducts along with the anatomical outline and diameter of the ducts.

(e) Specimen Examination: Stool examination may show Ascaris eggs in stool. Many times the patient passes an adult worm with vomitus or with stool. Aspiration of the pus from hepatic abscesses may reveal Ascaris ova because larval stages or the ovas are more likely to produce inflammation leading to granulomatous necrosis than adult worms [9,13].

The complications of biliary ascariasis include obstructive jaundice, acute cholangitis, acute cholecystitis, intestinal obstruction with complications like volvulus, gangrene or perforation, choledocholithiasis, acute pancreatitis, recurrent pyogenic cholangitis and liver abscess.

Over 5% of hepatobiliary ascariasis develop recurrent pyogenic cholangitis after 2 or more years [22]. The nidus of biliary stones in 72% of recurrent pyogenic cholangitis is formed by part or whole of Ascaris worm which confirms the significant role of this helminth in cholelithiasis [23]. Pure biliary ascariasis have a negligible mortality < 2% [24].

The treatment revolves around conservative medical management with anthelmintic agents in the majority. Oral anthelmintics allow the paralyzed worms to be expelled by normal intestinal activity. However, they do not affect the larval stage. They are administered only if the patient has passed flatus or feces. The worm clearance is usually completed by 3 days in most cases depending on the gut transit time, pre-existing diarrhea and worm load.

The patients require hospitalization as the worm load is usually high. Broad-spectrum antibiotics, analgesics and intravenous fluids are prescribed to treat associated cholangitis or cholecystitis. Most patients with acute acalculous cholecystitis recover without any complications [9].

In acute pyogenic cholangitis, more specific antibiotics are indicated depending on the biliary pus culture and sensitivity results. The pus is obtained by duodenoscopy or ERCP from the...
pus points in the papillary orifice or bile aspiration respectively. In complicated cases, management of endotoxic shock and correction of metabolic acidosis is also required. Laparotomy is indicated if ERCP is not available for worm extraction in the patients who deteriorate during hospitalization.

Failure to respond to medical therapy usually indicates the need for endoscopic or surgical interventions. A wait period of 3 weeks despite vermifuge is recommended. Endoscopic worm extraction from ampullary orifice rapidly relieves the symptoms in biliary colic or acute pyogenic cholangitis [9]. In almost all cases, endoscopic worm extraction from the ampulla and in about 90% cases from the bile ducts is successful by using the endoscopic basket [27]. Rare complications include hypotension and cholangitis.

In young children, associated mechanical intestinal obstruction is common and may follow deworming during or after institution of treatment. Also, the excretion products of the worms can cause marked bowel contraction. There is a definite mortality risk in those with associated acute hemorrhagic pancreatitis. Coexistent obstructive jaundice and intestinal obstruction are indications for surgery [4]. Acute pyogenic cholangitis needs biliary decompression or drainage in most cases [26]. Cholangitis with biliary strictures or worms in the gall-bladder are also indications for surgery [27,28]. In RPC, recurrent cholangitis with obstructing stones may be managed by placing a Roux-en-Y jejunal conduit for biliary access [29].

References