PRESENTATION AND ENDOSCOPIC MANAGEMENT OF BILIARY ASCARIASIS

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Abstract. *Ascaris lumbricoides* is a common parasite and the most serious and dramatic presentation is hepatobiliary and pancreatic ascariasis (HPA). Therefore, this study was planned prospectively to elucidate the clinical presentation of HPA and evaluate the efficacy and safety of endoscopic intervention. In this study we documented 77 consecutive patients with HPA from January 2000 to November 2005. All the patients had endoscopically proven HPA. A total of 77 patients were included in the study. The age ranged from 6 to 80 years, with the third decade most commonly (28.6%) affected. Females were 6 times more likely to be affected than males. The commonest presentation was biliary colic (97.4%); other presentations were acute cholangitis (15.6%), obstructive jaundice (9.1%), acute pancreatitis (6.5%), choledocholithiasis (6.5%), acute cholecystitis (6.5%) and liver abscess (2.6%). In this report 51 (66.2%) had living, 10 (13%) had dead and 16 (20.8%) had both living and dead worms. Choledocholithiasis was associated only with dead worms. From one to 23 worms were found in the biliary tree. In 94.8% of cases we had to remove the worm by wide papillotomy followed by basket extraction. We did not experience any major complications during or following the procedures. Three patients had recurrent HPA during the course of follow-up (1 to 12 months). The majority of patients with HPA presented with biliary colic. This should be kept in mind in the management of an acute abdomen, especially in tropical countries. Endoscopic extraction is a safe and effective procedure for the treatment of HPA.

INTRODUCTION

Ascaris lumbricoides is a common parasite and over a billion people are estimated to be infested with it (WHO, 1990). The incidence is higher in developing countries. There are several ways in which intestinal ascariasis can manifest (Misra and Dwivedi, 1996; Anonymous, 1989. Bhasin and Chinna, 1989). However, the most dramatic and serious presentation is biliary ascariasis (Khuroo *et al,* 1990). The adult worm occasionally lodges in the common bile duct and produces partial bile duct obstruction (Cordova *et al,* 1997). The ascaris worm may be a nucleus for intrahepatic gall-stones (Hou and Pang, 1964). Biliary ascariasis is a common problem in certain parts of the world (Cremin and Fishcer, 1976). Although it is not common in developed countries, with increasing air travel and immigration, clinicians in developed countries may encounter patients with biliary ascariasis more frequently. In India, biliary ascariasis has been reported as being endemic in the Kashmir valley (Khuroo and Zargar, 1985; Khuroo *et al,* 1989). In Bangladesh, the incidence of biliary ascariasis is not infrequent.

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MATERIALS AND METHODS

We documented 77 consecutive cases of biliary ascariasis by clinical presentation,

ultrasonographic findings and management from January 2000 to November 2005, at the Department of Hepatology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. All were followed for one to twelve months for complications and recurrence. All patients underwent ultrasonographic examination of the hepatobiliary system after being seen by a clinician. Inclusion criteria were patients with acute abdominal pain which was progressive or not relieved by 1 week of conservative management with ultrasonographic evidence of biliary ascariasis and endoscopic evidence HPA at any time during the illness. Exclusion criteria were hemodynamically unstable patients, recent myocardial infarction and coagulopathy. Endoscopic retrograde cholangiopancreatography (ERCP) was performed when the ascaris worm was fully inside the papilla (Fig 1). If a part of the round worm was visible outside the papilla of Vater, it was caught in a Dormia Basket and pulled out. If the worm had fully migrated inside the bile duct, then endoscopic sphincterotomy was performed and the worm(s) removed. To extract large worms which could not be extracted through the working channel, the scope had to be withdrawn completely until all the worms were removed. In the case of living worms, a few re-entered the biliary channel after partial extraction, which required repeated maneuvers for successful extraction. In the case of dead worms, a few torne during extraction which required repeated basket sweeping. All patients were subsequently given albendazole 400 mg once in a week for two consecutive weeks and thereafter, every three months.

RESULTS

The mean (±SD) age of the patients was 36.66 (±17.61) years. Of 77 patients, 66 were females and 11 were males. Seventy-five (97.4%) patients presented with features of biliary colic, 12 (15.6%) presented with features of acute cholangitis, 6 (9.1%) presented with obstructive jaundice, 5 (6.5%) presented with acute pancreatitis, 5 (6.5%) presented with choledocholithiasis (Fig 2), 5 (6.5%) presented with acute cholecystitis and 2 (2.6%) presented with liver abscess (Table 1). Some patients had overlapping features on presentation. Abdominal ultrasonography was positive for worms in 76 cases and negative for worms in 1 case. In regard to the location of the worms, they were inside the CBD in 73 (97.4%) cases, inside the CBD and gall bladder in 5 cases, partially inside the common bile duct (CBD) and partially outside it in 4

Fig 1–ERCP showing Ascaris inside the CBD.

Table 1
Presentation of biliary ascariasis.

Presentation	No. (%)
Biliary colic	75 (97.4)
Acute cholangitis	12 (15.6)
Obstructive jaundice	6 (9.1)
Acute pancreatitis	5 (6.50)
Choledocholithiasis	5 (6.50)
Acute cholecystitis	5 (6.50)
Liver abscess	1 (2.6)

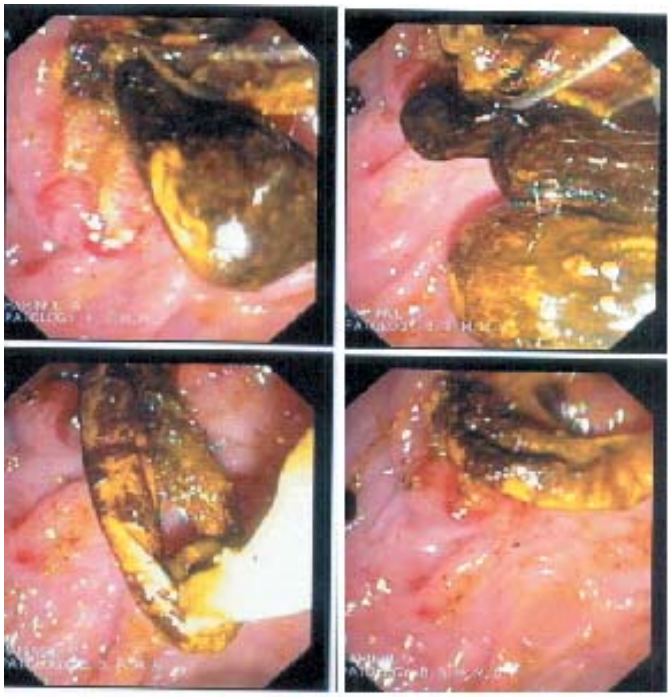

Fig 2–Endoscopic view showing biliary stone with dead worm.

a b

Fig 3–Ultrasonogram showing Ascaris inside the common bile duct (3a) and inside the gall bladder (3b).

cases, and inside the pancreas in 2 cases.

Endoscopic intervention was needed for all patients. Endoscopic retrograde cholangiopancreatography was done if the worm was completely inside the biliary tree. Papillotomy and basket extraction were done for 73 patients. Only basket extraction was done for 2 patients. In another 2 patients, worms were removed by foreign body forceps. The numbers of worms removed were 21 worms in 1 case, 12 worms in 1 case, 6 worms in 1 case, 4 worms in 1 case, 5 worms were removed each in 3 cases, 3 worms each in 6 cases, 2 worms each in 15 cases and 1 worm each in 49 cases. Regarding the status of the worms at ERCP, 51 (66.2%) patients had living worms, 10 (13%) had dead worms and 16 (20.8%) had both living and dead worms.

All patients were followed for one to twelve months after the procedure. No patients had procedure-related complications. Three patients had recurrent biliary ascariasis during the follow-up period.

DISCUSSION

Biliary ascariasis is a common problem in certain parts of the world (Yang and Laube, 1946). This pale yellow worm is about 20-35 cm long. Humans are infected by eating food contaminated with mature ova. Ascaris larvae hatch in the duodenum, migrate through the lungs, ascend the bronchial tree, are swallowed and mature in the small intestine (Todd *et al,* 2002). However, patients infested with worms that have invaded the ampulla of Vater usually present with biliary colic or acute pancreatitis due to a blocked CDB or pancreatic duct. These worms migrate through the CBD, cystic duct and intrahepatic bile ducts leading to biliary colic and cholangitis. The presence of a dead worm forms the

nidus for a CBD or hepatic stone. These worms have high glucoronidase activity which deconjugates bilirubin and forms pigment stones (Pilanker *et al,* 2003). Biliary ascariasis is predominantly a disease of adult women (Khuroo and Zargar, 1985). These patients usually present with biliary colic (56%), acute cholangitis (25%), acute cholecystitis (13%), acute pancreatitis (6%) and rarely hepatic abscess (less than 1%) (Khuroo *et al,* 1990). In our study, 97.4% of patients presented with biliary colic, 15.6% with acute cholangitis, 9.1% with obstructive jaundice, 6.5% with acute cholecystitis, 6.5% with acute pancreatitis, 6.5% with choledocholithiasis and 2.6% with liver abscess (Table 1). In most of the cases, the condition was a medical emergency. The present study demonstrates biliary ascariasis is a common problem in our region and should be considered in the differential diagnosis of an acute abdomen.

Abdominal ultrasonographic examination is the best tool for diagnosis in a suspicious patient. In a study where the diagnostic value of ultrasonography in ascariasis was investigated, ultrasonography was considered as an effective and reliable method in the diagnosis of hepatobiliary, enteric and pancreatic ascariasis (Ferreyra and Cerri, 1998). The ultrasonic appearance of biliary ascariasis has been described in detail. Features include the presence of long echogenic structures (Fig 3a,3b), single or multiple, linear or curved structures with or without a central anechoic tube, mostly without an acoustic shadowing (Khuroo *et al,* 1987). If the typical findings are not seen, choledocholithiasis may also be confused with biliary ascariasis (Misra *et al*, 1999), especially since acoustic shadowing may not be seen in about 10% of common bile duct stones (Dewbury and Smith, 1983, Einstein *et al,* 1984; Kane *et al,* 1988). Most patients (85.7%) in our study were young middle aged (mean 36.66 years) females. The exact reason for female preponderance is still not clear. It is possible the hormone progesterone in these young females leads to relaxation of the smooth muscles of the sphincter of Oddi, allowing the ascaris worms easy access to the bile duct. Progesterone is a known inhibitor of smooth muscle contraction (Fisher *et al,* 1978; Cohen *et al,* 1980) and is known to significantly increase gall bladder volume and decrease its emptying (Everson *et al,* 1982). A similar delay in emptying the gallbladder is seen in the normal menstrual cycle (Nilsson and Sattin, 1967).

Treatment of biliary ascariasis is endoscopic extraction of the worm(s) from the bile duct with or without sphicterotomy, which gives immediate relief (Pilanker *et al*, 2003). Gorgul *et al* (1995) reported a biliary ascariasis case which was removed by balloon extraction after endoscopic sphincterotomy. They stated this procedure was feasible and harmless in the treatment of biliary ascariasis. In our study, endoscopic retrograde cholangiography and papillotomy was needed in 73 patients and basket extraction was needed in 75 patients. The management of biliary ascariasis is easy if a part of the worm is visible outside the papilla of Vater. The worms can simply be caught and removed. In our study, worms in 2 of 4 cases where worms were partially outside the CBD, were removed by foreign body forceps.

Re-infection is commonly found in patients who have previously undergone endoscopic sphincterotomy (Todd *et al,* 2002). We found this in three cases.

In conclusion, biliary ascariasis presents, in most instances, with biliary colic but may present with cholangitis, obstructive jaundice, acute pancreatitis or liver abscess. Ultrasonography is an effective tool for diagnosis. Endoscopic management is successful, safe and suitable for these patients. Biliary ascariasis is a cause of acute abdominal pain and should be kept in mind in endemic countries.

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