

Endoscopic Management of Biliary Ascariasis

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Abstract

Background: *Ascaris lumbricoides* is common intestinal parasite and biliary ascariasis is the commonest extra intestinal manifestation of round worm. This study was aimed to review the predisposing factors, presentation and the role of endoscopic management of biliary ascariasis.

Method: We performed retrospective analysis of 182 patients diagnosed and admitted as biliary ascariasis in the department of General Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka from April 2016 and April 2021. Ultrasonographic findings of abdomen were the mainstay of diagnosis.

Results: Biliary ascariasis was more common in female (78%). The most common presentation was pain (100%). ERCP was done successfully in 90.7%. All patients were given anthelmintic. There was no complication.

Conclusion: Ultrasound is a reliable screening test for diagnosis and ERC provides confirmation. Once diagnosed, endoscopic extraction of the worm is often successful and provides prompt relief to the patient. Anthelmintics should be administered for eradication of worms from the intestine and to prevent their reentry into the biliary tree.

Introduction

Ascaris lumbricoides is the largest common nematode causing human ascariasis¹ and 33% of the world population are estimated to be infested with it.² It is possibly the first recorded parasitic worm disorder affecting human being and referred to old Greco-Roman and Chinese books. Linnaeus presented the first precise interpretation of the genus *Ascaris*, Epstein and Grassi revealed that the contamination occurs by ingestion of eggs.³

Ascaris 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. It affects the lungs, intestine, appendix, liver, bile duct and pancreas. It shows no clinical manifestation in maximum infected patients.^{4,5}

Different types of severe disease may develop from those affected by ascariasis the number of which is roughly calculated to be 60 million. Disease manifest

clinically when the burden of is substantial (13- 40) and around 10,000-20,000 deaths occurs annually globally due to severe disease.^{6,7,8} Epidemics of ascariasis can occur.⁹ The adult round worm normally lives in the small intestine. Because they have 'wanderlust' and tend to explore ducts and cavities they often invade bile or pancreatic duct. Most of the patient in our study presented with upper abdominal colicky pain.¹⁰

It infects about 25% of the world's population; around 20 thousand deaths occur per year from an adverse clinical course of the disease. Although an endemic disease of tropical and subtropical countries, increasing population migration facilitated by fast improving communication facilities demands that clinicians everywhere be familiar with the clinical profile and management of biliary ascariasis.

Methods

A total of 182 patients with diagnosis of biliary ascariasis were analyzed retrospectively those who got admitted

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in the department of General Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka from April 2016 and April 2021. Ultrasonographic findings of abdomen were the mainstay of diagnosis. Before being admitted to our hospital all the patients were managed conservatively with intravenous fluids, antibiotics and antispasmodic. All patients got a single dose of albendazole. Endoscopic intervention was carried out only after the conservative management failed. If a part of the round worm was found outside of the ampulla of Vater, it was pulled out by holding in a Dormia basket. When the worm had migrated fully inside the common bile duct we performed sphincterotomy and removed worm or worms. The clinical features, imaging findings treatment and follow-up of patients were recorded. The principal tool for diagnosis was sonographic findings.

Results

A total of 182 patients were included in this study. Biliary ascariis was found to be higher incidence in female (78%) (Table I). In our study biliary ascariis was more common in middle class (76.4) (Table II). All the patients had pain (100%) (Table III).

Table I: Socioeconomic status

Socio-economic status	Frequency	Percent
Lower	34	18.7
Middle	139	76.4
Upper	9	4.9
Total	182	100.0

Table II: Clinical presentation

	Frequency	Percent
Pain	182	100.0
Jaundice	8	4.4
Fever	9	4.9
Vomiting	3	1.6
History of sphincterotomy	5	2.7

Table III: Contents of CBD

	Frequency	Percent
Nothing	5	2.7
Linear echogenic structure with anechoic core	162	89.0
Linear structure	1	.5
Stone	14	7.7
Total	182	100.0

Table IV: Worm extraction findings

	Frequency	Percent
No worm	26	11.5
Worm	113	53.3
Worm & Stone	26	8.2
Stone	16	2.7
Total	138	75.8
	182	100.0

Table V: Worm number

	Frequency	Percent
No	23	12.6
One	117	64.3
Two	20	11.0
Three	17	9.3
>3	5	2.7
Total	182	100.0

Table VI: Worm clearance

	Frequency	Percent
Failed	17	9.3
Complete	165	90.7
Total	182	100.0

Table VII: Advice after ERCP

	Frequency	Percent
Repeat ERCP	6	3.3
Regular Dewarming	176	96.7
Total	182	100

Table VIII: Immediate pain relieve

	Frequency	Percent
No	6	3.3
Yes	176	96.7
Total	182	100

Table IX: Results

	Frequency	Percent
Recurrence	1	.5
No recurrence	181	99.5
Total	182	100.0

Discussion

In the present study higher prevalence of biliary ascariasis was found in the female sex which was consistent with other reports.^{1,4,8} This has been attributed to progesterone induced sphincter of Oddi relaxation encourages relocation of worm in bile duct.⁴ In other study previous sphincterotomy has been accredited as the prime reason for biliary ascariasis.⁵ In our study five patients had earlier endoscopic sphincterotomy and choledochoduodenostomy for biliary bypass in a single case. Thus, pain, jaundice fever, vomiting history of sphincterotomy as the most important cause of the worms into the biliary tree.

Pain is the commonest mode of presentation in biliary ascariasis and has been reported in 60-90% patients across various series.^{1,2,3,4,8} Though described as biliary colic in these reports, the round worm produced agony in our study was classic and deserve advanced modification. All but one patient presented with acute onset pain abdomen that mimicked pancreatic pain i.e. acute upper abdominal pain radiating to the back, except that it was waxing and waning in nature with minimal abdominal signs. The serum amylase was normal in these patients thus excluding pancreatitis as the cause of pain.

Biliary ascariasis may present with the features of surgical jaundice, cholangitis, cholecystitis, pancreatitis and suppuration in the liver.^{1,2,3,4,8} Acute cholecystitis was observed in a single case in our study.

When the patient has had prior sphincterotomy they show no clinical or biochemical evidence of biliary obstruction as it does not allow complete obstruction. In addition the movement of a live worm in and out of the CBD resulting in an intermittent obstruction is a well known phenomenon.

Dependable screening test for the diagnosis of biliary ascariasis is trans-abdominal ultrasound examination.^{7,9} This study confirms worms in 114 patients and worm with stone in 26 patients while performed ERCP. During the procedure of ERCP worm protruding out of ampulla was observed in several cases that confirmed the diagnosis. On ERC linear or curvilinear filling defects in the biliary tree confirm ultrasound findings and the diagnosis of biliary ascariasis. As they have tendency to walk backwards and forwards in the common bile duct absence of filling defect in the cholangiogram but

positive results in USG may be interpreted by their existence near the papilla

Conservative treatment and oral antihelminthics have been found to be successful in more than 80% of patients with biliary ascariasis.^{2,4,6} Some authors, however, recommend early intervention to ward off complications.^{1,3,8} Surgical intervention can be undertaken in the form of cholecystectomy and/or CBD exploration with complete removal of the worms.^{2,3} Synchronous enterotomy and worm extraction has also been performed to ward off re-infection. When facilities are available endoscopic extraction of the worms appear to be a better alternative and gives prompt relief.^{1,4,5,8,9} Endoscopic extraction was successful in all our patients and provided a prompt relief to the agonizing pain they were suffering from. Re-infection was noted in one of our patients. This is similar to the experience reported by other authors.² To minimize the problem of recurrence, they recommend endoscopic balloon sphincteroplasty instead of conventional sphincterotomy prior to worm extraction from CBD. Though we concur with the authors on this issue, we did not have the opportunity to employ this in our patients.

Conclusion

Biliary ascariasis, though uncommon in non-endemic area, should be considered in the diagnosis of acute abdomen. This is particularly true in patients who have undergone prior biliary sphincter ablation/bypass procedures like sphincterotomy or choledochoduodenostomy. Pain could be the only presenting feature and is often out of proportion to the abdominal signs. Ultrasound is a reliable screening test for diagnosis and ERC provides confirmation. Once diagnosed, endoscopic extraction of the worm is often successful and provides prompt relief to the patient. Antihelminthics should be administered for eradication of worms from the intestine and to prevent their reentry into the biliary tree.

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