**Biliary Ascariasis in Children**

**Author**

**Sujay Chaudhuri**
Division of Pediatric Gastroenterology, Department of Gastroenterology, PGIMER Chandigarh
Address: Akshaytara Apartment, Flat No. 1/7, 2nd Mile Sevoke Road, Siliguri – 734001,
Near Don Bosco
Mobile – 7797931687, Email: drsujoychowdhury@gmail.com

**Abstract**

**Objectives:** Biliary ascariasis is a serious problem in children. Its early diagnosis and management is essential for survival of children. In order to find out incidence, investigational profile, therapeutic modality of biliary ascariasis in children the following study was conducted.

**Method:** The children (less than 10 years) who came to attend Pediatric Gastroenterology OPD in PGIMER Chandigarh from July 1993 to June 2003 with history suggestive of hepatobiliary/pancreatic/ascariasis (e.g. round worm expulsion/ abdominal pain/ vomiting/ jaundice etc.) were admitted to pediatric gastroenterology ward. Detailed history taking / clinical examination/ investigation (USG whole abdomen/ MRCP/ LFT/amylase/lipase/PTI/ERCP etc. as per individual case) were done. During ERCP, worms were extracted from duodenal papilla by snare/dormia basket. IV fluid /IV antibiotic / NPO/nasobiliary drainage etc. were done.

**Results:** Fifty cases of biliary ascariasis in children were admitted. Age was 3-10 years (mean – 6 years). Out of 50 cases, 45(90%) had abdominal pain, 25(50%) had cholangitis, 15(30%) had jaundice, 50(100%) had vomiting. In ERCP, worms were extracted by snare /dormia basket. Double pigtail plastic biliary stent was deployed in 30(60%) cases. Nasobiliary drainage was done in 10(20%) cases. IV drip/inj.antibiotic etc. were done. After removable of worms, all of the 50cases recovered remarkably. There was up and down movement of worms in bile duct and hepatic duct. None developed cholangitic abscess/ hepaticabscess/ hemobilia/hepatothiary stone in subsequent follow up.

**Conclusion:** Biliary ascariasis is a serious problem in children. Endoscopic management is very much useful to tackle this problem

**Keyword:** Biliary ascariasis, children.

**Introduction**

Ascariasis is a global problem. It mainly involves large number of children in tropics. Hepato Biliary ascariasis is an unique problem which is diagnosed by USG / Endoscopic procedure. It is manifested as acute abdomen with jaundice, recurrent pyogenic cholangiopathy which can be managed by medical, endoscopic or surgical therapy. Fixed modality of treatment is difficult to obtain. But high index of suspicion is a must.\(^{(1)}\)

Baba AA et al observed that 25% of world population is affected by ascariasis. It has high incidence in Kashmir. Intestinal obstruction is commonest but biliary ascariasis is second...
common manifestation. Cholangiatis, obstructive jaundice, acute pancreatitis, hepatic abscess are common presentation of biliary ascariasis. ERCP and surgical procedure are needed for biliary ascariasis. Sandonk F et al observed that in endemic area, ascariasis should be suspected in patients with pancreatico biliary disease- specially in post cholecystectomy or post sphincterotomy state. Endoscopic management quickly relieves complications. Ascending cholangitis, acute pancreatitis, obstructive jaundice are common presentation. Khuru MS et al observed that in ascariasis induced acute pancreatitis, endoscopic management is a great value. In pyogenic cholangitis, endoscopic nasobiliary drainage is a great help to decompress system. At ERCP, worms are extracted from ampullary orifice by Dormia Basket. It rapidly relieves abdominal pain. In biliary ascariasis pancreatitis is mild in 80% cases and severe in 20% cases. Ascaris is found in 80% cases in bile duct, 10% cases in pancreatic duct and 10% cases in both ducts. Biliary ascariasis is common in Kashmir. Osman M et al observed that in biliary ascariasis, USG/CT/MRI are not only for diagnosis but also for follow up and surveillance of cases. ERCP has both diagnostic and therapeutic option. Surgery is needed for complicated cases. Rana SS et al observed that ascaris invades bile duct through papilla. ERCP has both diagnostic and therapeutic potentials. Biliary tract can be invaded by other parasites (e.g. Clorchis sinensis causes intra hepatic stone, recurrent pyogenic cholangitis, cirrhosis, cholelithasis, pancreatitis, cholangio carcinoma). CT/MRI/USG are useful. Reddy DN et al observed that ascariasis is common cause of biliary obstruction in developing country. It is very often confused with stone disease. Worldwide increase of biliary ascariasis is noted. Biliary colic or cholangitis are main manifestation. Endoscopic sphincterotomy, bile duct clearance are mainstay of treatment. Joyce AM et al observed that ERCP have made revolutionary change in biliary tract disease. Ascaris is removed in ERCP from ampulla by Snare and Dormia Basket. Ascaris can cause choledocholithasis. The bile duct stone can be easily removed by Sphincterotomy and balloon dilatation. Misra SP et al observed that biliary ascariasis is successfully managed by endoscopic procedure (Round worm removed by Dormia Basket / biliary stent (to decompress biliary system / endoscopic sphincterotomy / albendazole).

Method
The children (less than 10 years) who came to attend Pediatric Gastroenterology OPD in PGIMER Chandigarh from July 1993 to June 2003 with history suggestive of hepatobiliary/pancreatic/ascariasis (e.g. round worm expulsion/abdominal pain/vomiting/jaundice etc. were admitted to pediatric gastroenterology ward. Detailed history taking / clinical examination/investigation (USG whole abdomen/ MRCP/LFT/amylase/lipase/PTI/ERCP etc. as per individual case) were done. During ERCP, worms were extracted from duodenal papilla by snare /dormia basket. IV fluid /IV antibiotic /NPO/nasobiliary drainage etc. were done.

Results
Fifty cases of biliary ascariasis in children were admitted. Age was 3-10 years (mean – 6 years). Out of 50 cases, 45 (90%) had abdominal pain, 25(50%) had cholangitis, 15(30%)had jaundice, 50(100%) had vomiting. In ERCP, worms were extracted by snare /dormia basket. Double pigtail plastic biliary stent was deployed in 30(60%)
cases. Nasobiliary drainage was done in 10(20%) cases. IV drip/inj.antibiotic etc. were done. After removable of worms, all of the 50 cases recovered remarkable. There was up and down movement of worms in bile duct and hepatic duct. Non develop cholangitic abscess/hepatic abscess/ hemobilia/ hepatobiliary stone in subsequent follow up.

**Discussion**

Khuru MS et al observed that ascaris induced acute pancreatitis have overall motarility of 3%. Endoscopic naso biliary drainage is useful for pyogenic cholangitis. Ascaris invades ampulla in 30% / bile duct in 60%/ pancreatic duct in 4% cases.(11)

Khuru MS et al observed that in hepatobiliary pancreatic ascariasis in India, there is acute cholecystitis in 12%, acute cholangitis in 25%, biliary colick in 6%, acute pancreatitis in 7%, hepatic abscess in 0.4%, biliary ascariasis in 34%, bile duct / entраhepatic duct dead worm in 1.2%, duodenum ascariasis in 54%. Dead worms are extracted by endoscopic procedure/surgery. (12)

We had abdominal pain in 45(90%), cholangitis in 25(50%), jaundice in 15(30%), vomiting in 50(100%).

Das C.J et al observed that USG showed ascaris interwined into abolus – causing intestinal obstruction / volvulus / perforation.

Ascaris in gall bladder / bile duct/ pancreatic duct are manifested by biliary colick, GB stone, cholecystitis, pyogenic cholangitis, liver abscess, pancreatitis. (13)

Leung JW et al observed that endoscopic worm extraction from pancreatic duct was difficult. Cholangitis can be treated by endoscopic worm extraction with or without sphincterotomy. (14)

Iscan M et al observed that biliary ascariasis can cause cholangitis, pancreatitis, even bile duct perforation. (15)

We did CBD stenting in ERCP in 30(60%) cases. In rest 20(40%) cases worms were removed from ampulla by snare.

Janid G et al observed that GB ascariasis is a significant entity in endemic area – though it is less common than CBD ascariasis. It requires lap cholecystectomy. Spontenous expulsion of worm from GB is rare. (16)

Chakraborty I et al observed that in ascariis induced liver abscess – FNAC from liver abscess showed fertilized eggs. They responded well to conservative management. (17)

We didn’t have cholangitic abscess.

Z Mazid et al noticed that invasion of ascaris in cystic duct is an uncommon problem. They noticed multiple linear echogenic foci in distal small intestine – along with GB stone / thick walled GB / single stone compressing CBD (Mirrizi syndrome). (18)

M.Klimovshij et al observed slightly dialated CBD without filling defect in ascariasis in pancreatic duct. They removed ascaris from pancreatic duct. Levamisole was given orally and repeated after 7days. (19)

Mukhopadhya M et al observed that there was 7% recurrence of biliary ascariasis after successful treatment. It is more common in post cholecystectomy/ post sphincterotomy state. (20)

We got multiple worms in all 50(100%) cases – 20 (40%) was linear and 30(60%) were coiled.

Schulmn A et al observed that hepato biliary ascariasis causes intrahepatic calculi – which are evenly distributed in both lobes of liver which were clinically silent. Small number of intrahepatic stone are associated with GB stone. (21)

We did not get biliary stone due to ascaris.

Maddern G et al observed that ascaris pancreatitis is rare in west. It is a non indigenous cause of biliary tract obstruction. (22)

We did not have ascaris induce pancreatitis.

Khuru MS et al observed that GB ascariasis is rare (1%).

Sonographic findings include non shadowing , long echogenic strip with central echogenic structure extending across GB giving separate appearance and characteristic erratic zigzag multi directional movement of echogenic structure in GB.

In our study we did not have GB ascariasis.
Real time sonography is a simple rapid approach for diagnosis and follow up patients with biliary ascariasis. ERCP has limited diagnostic value but immense therapeutic scope.\(^{(23)}\)

Coll P et al observed an unusual cause of haemobilia in a case of biliary ascariasis. Angiography shows left hepatic artery aneurysm which was successfully embolised.\(^{(24)}\)

Lloyd DA et al observed that massive infestation of ascaris in bile duct or liver is uncommon but one or two ascaris migrating in bile duct is common.\(^{(25)}\)

Braga LH et al observed that a case of biliary ascariasis in previously operated six year old girl who had biliary digestive tract surgery by Roux-en-y hepatico Jejunostomy for choledochalcyst. After biliary tract surgery, biliary ascariasis can happen in endemic area where ascariasis is highly prevalent.\(^{(26)}\)

We did not have any case of previous biliary tract surgery.

Jessen K et al observed that urgent ERCP/ endoscopic decompression is needed in ascariis induced acute obstructive cholangitis. Obstructive jaundice, cholangitis, liver abscess is secondary to biliary ascariasis.\(^{(27)}\)

In our study CBD stenting was done in 30(60%) cases.

In biliary ascariasis, biliary cholelithiasis, jaundice, acalculous cholecystitis, choledocholithiasis, pancreatitis, cholangitis are common. Pancreatitis is less common. Endoscopic management is very much effective.\(^{(28)}\)

Gonzalez AH et al observed that biliary ascariasis should be initially managed by IV fluid/ antispasmodic/ albendazole. Those who have persistent symptoms and hyper amylasemia underwent duodenoscopy and extraction of residual worms by snare.

14% cases have invasion of ampulla. These worms are removed without sphincterotomy. Invasive method of sphincterotomy and surgery should be reserved to those who failed in conservative regime.\(^{(29)}\)

SA Zargar et al observed that endoscopic sphincterotomy is often not needed because of patulous ampulla in biliary ascariasis. Presentation of one or two worms in papillary orifice facilitate and guide the advancement of canula basket or mesobiliary tube.

Worms being soft, compressible linear structure can be easily retrieved through intact papilla. Apart from mortality and morbidity associated with sphincterotomy, wider papillary orifice predisposes to recurrent worm invasion in an endemic area.\(^{(30)}\)

Sphincterotomy is not needed in our 50 cases.

**Conclusion**

Biliary ascariasis is a serious problem in children. Endoscopic management is very much fruitful. Early diagnosis and management is essential for survival of the children.

**Conflict of interest** – Nil

**Reference**

1. Hepatic and biliary ascariasis, Das AK, J.Glob infect dis 2014 April 6(2) 65-72
2. Management of biliary ascariasis in children living in an endemic area, Baba AA et al Eur J pediatr surg 2010, May 20(3), 187-90
3. Pancreatic – biliary ascariasis, Experience of 300 cases, Am J Gastroenterol 1997 Dec 92(12), 2260-7, Sandonk F et al
4. Ascariasis induced acute pancreatitis, Br J surg 1992, Dec 79(12) 1335-8, Khuru MS et al
5. Biliary ascariasis: a review, World Journal of surgery, August 30(8) 1500-6, Shah OJ et al
6. Biliary parasites, Osman M, Dig. Surg 1998 15(4) 287-96
7. Parasitic infestation of biliary tract, Rana SS et al, Curr Gastroenterol rep 2007 April 9(2) 156-64
8. Endoscopic diagnosis and management of tropical parasitic infestation, Reddy DN et al, Gastro intest endosc clini N Am 2003 Oct 13(4), 765-73
9. Update on biliary endoscopy, Curr opin Gastroenterol 2005, May 21(3), 354-8
10. Endoscopy assisted emergency treatment of gastroduodenal and pancreatic biliary ascariasis, Misra SP et al, Endoscopy 1996 Sept 28(7), 629-32
11. Ascaris gastro clinic of north America 1996, Sept 25 (3), 553-77, Khuru MS et al
12. Hepatobiliary and pancreatic ascariasis in India, Lancet 1990, June 23, 335(8704) 1503-6, Khuru MS et al
13. Austral Radiol 2007, Dec 51(6), 500-6 Imaging of ascariasis, Das CJ et al
14. Endoscopic management of biliary ascariasis, Leung JW et al, Gastro intest endosc 1988, July – Aug 34(4), 318-20
15. Ascaris pancreatitis, Endoscopic diagnosis and therapy, Fortschar Med. 1991, April 20, 109(12), 251-2, Iscan M et al
16. Gallbladder ascariasis, Presentation and management, Br J surg 1999, Dec 86(12) 1526-7, Jamid G et al
17. Radiopathological diagnosis of hepatobiliary ascariasis- a rare entity Chakraborty I et al, J Cytol 2011, July 28(3), 114-6
18. Ascaris Lumbricoides and its invasion of accessory cystic duct – an unusual problem, Trop doct 2015, April 45(2), 129-31, By Z Mazid et al
19. Ascariasis of pancreatic duct, BMJ case report 2015, Sept 15, 2015, By M Klimovskij et al
20. Biliary ascariasis in Indian subcontinent – a study of 42 cases, Saudi J gastroenterol 2009, April 15(2) 121-4, Mukhopadhyya M et al
21. Schulman A Non western pattern of biliary stone and role of ascariasis Radiology 1987 162 425-30
22. Fatal ascaris pancreatitis – an uncommon problem in the west, Maddern G, Gut 1992 March 33(3), 402-3
23. Sonographic findings in gallbladder ascariasis, J clinic ultrasonad 1992 Nov – Dec 20(9), 587-91, Khuru MS et al
24. Pediatric radiol 1997, April 27(4) 348-9, An unusual cause of hemobilia – biliary ascariasis, Corr P et al
25. Br J surg 1981, July 68(7), 468-73, Massive hepatobiliary ascariasis in childhood, Lloyd DA
26. J pediatr surg 2000, Sept 35(9), 1394-5 Biliary ascariasis after Roux-en-y hepatico Jejunostomy Braga LH et al
27. Hepatogastroenterology 1986 Dec 33(6), 275-7, Endoscopic treatment of ascariasis causing acute obstructive cholangitis, Jessen K et al
28. Biliary ascariasis- report of a complicated case and literature review, Saudi J gastroenterol 2007, Jan-March 13(1) 25-32, Sanol FM et al
29. Trop med Int health-2001, Feb 6(2), 146-50, Non invasive management of ascaris lumbricoides biliary tract migration- a prospective study in 69 patients from Ecuador, Gonzalez AH et al
30. Management of biliary ascariasis in children, Indian J gastroenterology, 1990 9:321, Showkat Ali Zargar et al.