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Case report

PANCREATITIS SECONDARY TO *ASCARIS LUMBRICOIDES*: A CASE SERIES ANALYSIS

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ABSTRACT

Ascaris lumbricoides infestations are endemic in tropical countries. *Ascaris lumbricoides* is the second most common intestinal parasite world-wide and, although the infection can be asymptomatic, in some cases it can present with complications, such as acute pancreatitis. Pancreatitis secondary to *ascaris* is more common in females. We describe three cases who presented with *Ascaris lumbricoides*-induced acute pancreatitis and all of them were females and were diagnosed on ultrasonography. In two patients the sphincterotomy was done while in third patient the worm came out after two days of conservative management.

Keywords: Pancreatitis, *Ascaris Lumbricoides*, Ultrasonography, Tropical countries

INTRODUCTION

Infestation with gastrointestinal parasites is well known in Asian countries and is associated with a well recognized spectrum of biliary and pancreatic complications. In the Indian subcontinent, ascariasis is highly endemic in Kashmir (70%), Bangladesh (82%), and central and southwest India (20-49%)¹.

These parasites are transmitted via the faeco-oral route. Their eggs hatch in the small intestines and the larvae migrate through the gut wall into the bloodstream and to the alveoli. They subsequently move up the respiratory tract to the trachea and are swallowed. The larvae mature in the small intestines, deriving nutrients from

ingested food. Poor sanitation is usually the most important risk factor for infection, and women are more affected because progesterone plays a role in inducing Oddi's sphincter relaxation, allowing the nematode to access the biliary duct². *Ascaris lumbricoides* is the second most common intestinal parasite world-wide and, although the infection can be asymptomatic, in some cases, it can present with complications, such as acute pancreatitis³.

CASE REPORTS

Our first case was a 27 year old female with 4 months pregnant who presented with pain upper abdomen which was severe in intensity,

continuous type, radiating to back, aggravated by lying supine and multiple episodes of vomiting. Examination was normal except tenderness over epigastrium with 16 weeks of gestational age. Fetal heart sounds present with FHR of 130 beats/min. Investigation revealed Hb 9.5 mg/dl, total leucocyte count 14.8×10^3 /ul, DLC showed neutrophils 82.6% and lymphocytes 16.7%, platelets 98×10^3 /ul, MCV 88.9 fl, MCH 26.3 pg, urea 26 mg/dl, creatinine 1.1 mg/dl, sodium 145 meq/L, potassium 3.0 meq/L, pH 7.50, pO₂ 73 mmHg, amylase 1886 IU/L (repeat amylase 1379 IU/L), bilirubin 0.28 mg/dl, ALT 19 IU/ml, ALP 41 IU/ml, proteins 6.26 g/dl and albumin 3.4 g/dl. Ultrasonography of abdomen showed a large linear shadow extending from mid body to tail in the main pancreatic duct (MPD) (**Fig. 1**). Initially a diagnosis of acute mild pancreatitis with BISAP score of 1/5 was made. Patient was put on intravenous fluids and analgesics but there was no response instead pain got aggravated. Urgent esophagogastroduodenoscopy (EGD) was done which was normal ruling out worm across papilla which may cause so severe pain. Next morning she was subjected to endoscopic retrograde cholangiopancreatography (ERCP) [shield was used in view of pregnancy] which confirmed the presence of ascaris worm in main pancreatic duct (**Fig. 2**). Attempts to remove the worm from the duct failed. Hence patient was continued on conservative management and pyrantel pamoate (safe in pregnancy) 750 once a day for 7 days to

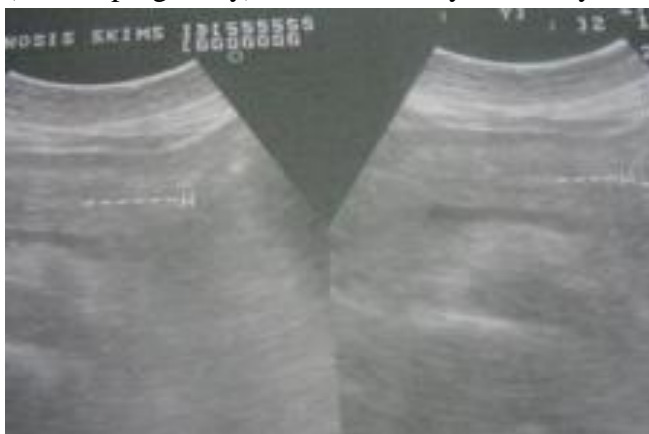


Fig.1: ultrasound of a 27 year old pregnant woman showing worm in main pancreatic duct (W)

which she responded. MRCP on follow up revealed no worm in MPD (**Fig. 3**).

Second case was a 13 year old female student presented with sudden onset pain upper abdomen which was radiating to back and aggravated on lying down. Pain was associated with profuse bilious vomiting. On examination there was tenderness epigastrium and right hypochondrium with mild guarding of abdomen. Ultrasonography showed bulky pancreas with hypoechoic linear shadow and double lumen sign suggestive of worm in the MPD (**Fig. 4**). Serum amylase was 2000 IU/ml. EGD showed worm across papilla hence sphincterotomy was done. Repeat USG after two weeks was normal.

Our third case of pancreatitis secondary to ascaris was a 45 year old female presented with pain upper abdomen which was severe in intensity, radiating to back, continuous, non colicky and relieved by analgesics. Nausea was associated with the pain. There was no history of vomiting, passage of worms, icterus or bleeding from any site. Examination of the patient was normal except for mild epigastric tenderness. Ultrasonography showed bulky pancreas and hypoechoic elongated focus suggestive of worm in main pancreatic duct (MPD) (**Fig. 5**). There was also a well defined perifollicular cyst 4.4×3.1 cm in right adnexial region. Serum amylase in this patient was 3400 IU/ml while rests of the investigations were normal. Patient was managed conservatively and USG on second day showed no worm in MPD.

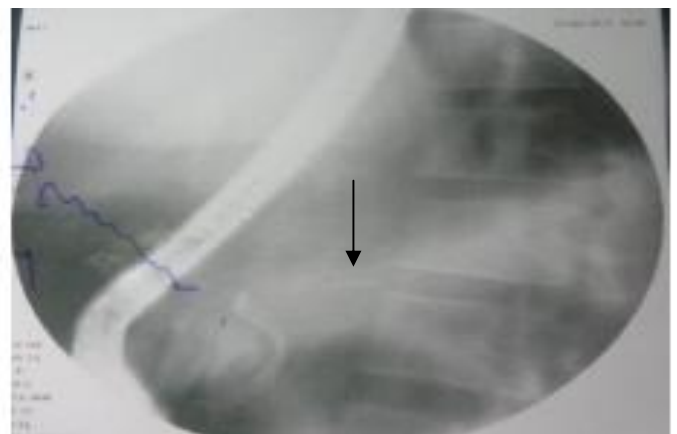
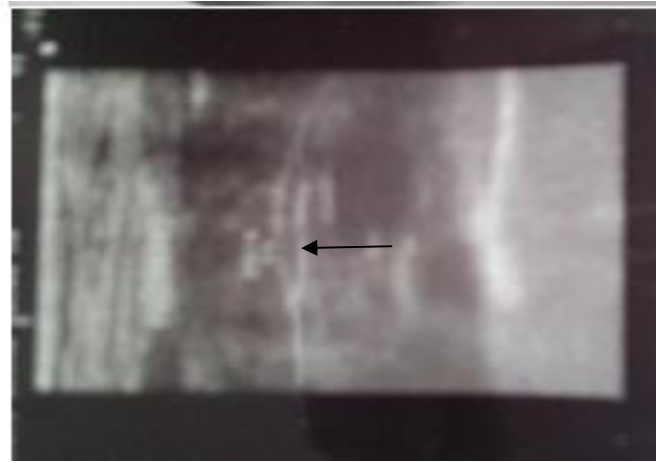


Fig. 2: ERCP of the same patient showing worm in MPD (arrow)



**Fig. 3: MRCP of the same patient on follow up.
No worm in MPD (arrow)**



**Fig. 4: Ultrasound of a 13 year old girl showing
worm in MPD (arrow)**

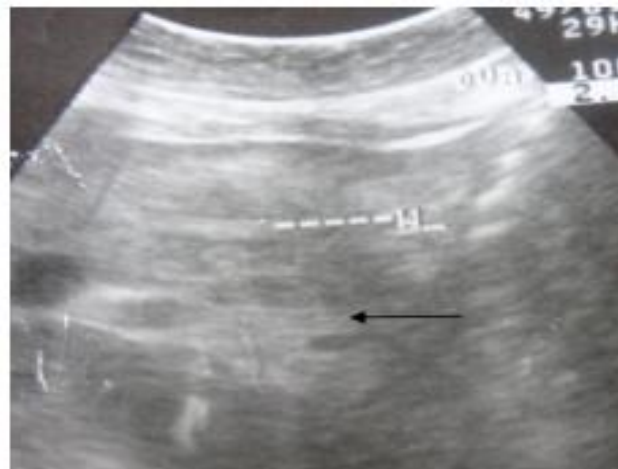


Fig. 5: Ultrasound of a 45 year old female showing worm in MPD (W)

DISCUSSION AND CONCLUSION

Ascaris lumbricoides is a common parasitic infestation that is known to infect more than a billion people worldwide⁴. Endemic areas include tropical and subtropical countries. The warm and humid climate is appropriate for the growth and development of the larva.

Ascaris lumbricoides infestation is acquired through ingestion of eggs in raw vegetables. The human is the definitive host. Ingested larvae penetrate the intestinal lymphatic and venous vessels and through the portal vein reach the right heart, pulmonary circulation and the alveoli. After alveolar rupture they pass into the trachea and the pharynx, are then swallowed; after about 2 months they reach maturity. In the bowel nematodes can perforate the intestinal wall, be ejected from the mouth or anus and

penetrate the biliary ducts or the airways. The infestation can present as a wide range of symptoms: intestinal perforation or occlusion, cholangitis, obstructive jaundice, acute pancreatitis or appendicitis, pneumonia and respiratory failure and allergic reactions to the ascaris antigen. In most cases, however, patients present with unspecific symptoms and sometimes the diagnosis is incidental².

Common clinical manifestations of this parasite include malnutrition, symptoms of intestinal obstruction and also pneumonitis, if the larvae load is high. The adult worm can invade the biliary or pancreatic ducts, or both, and cause complications such as biliary duct obstruction, cholecystitis, cholangitis and acute pancreatitis. Invasion of the pancreatic duct is rare because of

its narrow caliber. Pancreaticobiliary ascariasis commonly occurs with a background history of cholecystectomy and sphincterotomy.⁵

Ascaris lumbricoides causes pancreatitis due to obstruction of papilla of Vater, invasion of common bile duct, or invasion of pancreatic duct. Ascension of the parasite into the pancreatic ducts and calcified worm and ova remains are implicated in pancreatitis. The worm enters the pancreatic duct only as a result of abnormal migration. The clinical diagnosis of *Ascaris* pancreatitis requires a high degree of suspicion. While intestinal obstruction is more common in children, pancreatic ascariasis, unlike in adults, is rare. The hepatobiliary duct network in children is smaller and thus more difficult for worm entry. The mean age of patients who present with hepatobiliary and pancreatic ascariasis (HPA) is 35 years (range, 4 to 70 years), with a female-to-male ratio of nearly 3:1⁶. Pregnant women and patients with a history of biliary tree surgery who are infected with *ascaris* are at an especially heightened risk for contracting HPA⁷. There is a postulated female preponderance for biliary ascariasis due to the ampullary smooth muscle relaxing effect of the hormone progesterone.

Ascaris related clinical disease is not just restricted to patients with a heavy worm load⁸ but may be seen with a single worm lodged in the biliary tract and negative parasitic tests in the stools⁹. Pain is sudden in onset but may be gradual, the epigastrium being the commonest location. Other accompanying symptoms are vomiting, nausea and anorexia⁸, jaundice with fever being a sign of associated biliary tract involvement.

In the biochemical evaluation, the sensitivity of amylase in pediatric acute pancreatitis is less than in adults. Even then, it remains the most widely used single test in acute pancreatitis. The serum level rises within 2 to 12 hours. Some studies claim that stool examination lacks sensitivity and specificity¹⁰. Ultrasonography of the biliary system is the investigation of choice to reveal the aetiology of pancreatitis. It is capable of detecting stones and has been shown

to be able to detect ascariasis⁴. Ultrasonography is also the gold standard technique for follow-up. A case of a 64-year-old lady with acute pancreatitis was reported by Price et al¹¹ in 1988, in which pancreatic duct ascariasis was diagnosed based on the characteristic ultrasonographic appearance known as the “four-lines” sign.

Sandouk et al⁵ reviewed 300 patients with pancreatic ascariasis in Syria and showed that ultrasonography, together with clinical findings, are the mainstay of diagnosing pancreatic ascariasis⁵. Diagnostic ultrasonography is a simple, non-invasive test with a sensitivity of 50% to 86% for worms in the biliary tree; but the sensitivity for detecting worms in the pancreatic duct is unknown^{10,12}. The two major sonographic findings are:

1) Increased bulk and decreased echogenicity of pancreas.¹³

2) Long, linear, echogenic strips in the pancreatic duct that may show acoustic shadowing⁹.

A CT scan can also be useful but has a lower sensitivity than ultrasonography⁵. Endoscopic retrograde cholangiopancreatography is the gold standard method for identifying and removing the nematode from the duodenal, biliary or pancreatic tract².

Anthelmintic therapy with piperazine is preferred though mebendazole or albendazole is effective in eradicating ascariasis in 84% to 100% of cases¹². Feedings should be restarted when abdominal tenderness has disappeared, any ileus has resolved, and urinary amylase clearance has become normal. The prognosis of *ascaris*-induced pancreatitis is excellent if the patient is diagnosed and treated early. It requires prompt recognition and treatment to prevent complications⁵. Wait and watch protocol should be followed as there are high chances that worms come out with conservative management only.

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