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Case Note

Roundworm infestation presenting as acute abdomen in four cases – sonographic diagnosis

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Abstract
Infestation with Ascaris lumbricoides (roundworm) is very common in the tropics and subtropics. Patients with ascariasis can be asymptomatic or may present with different clinical features in the form of simple nausea, decreased appetite, abdominal pain or more severe bowel obstruction, perforation, intussusception, biliary colic etc. Ultrasonography (USG) can be quick, safe, noninvasive and relatively inexpensive tool in diagnosing the presence of worms and also evaluating response to treatment (1, 2, and 3). Here we present four cases of roundworm infestation presenting with acute abdomen in the emergency department, which were diagnosed by USG and further imaging features of ascariasis on USG is described.

Key Words: Roundworm, Ascariasis, Ultrasonography, Acute abdomen

The roundworm (ascaris lumbricoides) is one of the largest of the parasites that infest the human bowel and common in regions with poor faecal sanitation, particularly in developing countries in the tropics and subtropics. Patients with ascariasis can be asymptomatic or may present with different clinical features in the form of simple nausea, decreased appetite, abdominal pain or more severe bowel obstruction, perforation, intussusception, biliary colic etc. Most cases of ascariasis can be diagnosed by the microscopic detection of characteristic ascaris eggs in faecal samples, however adult worms may be visualized occasionally by means of USG examination or barium studies. Here the role of USG in diagnosis of abdominal ascariasis and its imaging features are presented.

Case 1

A 14- year old girl of low socioeconomic status presented with complaints of recurrent nausea, vomiting and acute onset of colicky abdominal pain and distension. She didn't give the history of fever or passage of worms in stool. Clinical examination was unremarkable except for tenderness in epigastric region. USG showed distended fluid filled bowel loops and multiple echogenic linear non-shadowing structures with central anechoic tube suggesting round worms (fig 1). In cross section they were round with central anechogenicity appearing as a "Target sign" (fig 2). Hepatobiliary system was within normal limit. After conservative treatment, the patient passed multiple worms and improved symptomatically.

Fig. 1 USG showing ascaris worm in the bowel loop as a parallel echogenic structure. The sonolucent central zone represents the intestinal tract of the worm

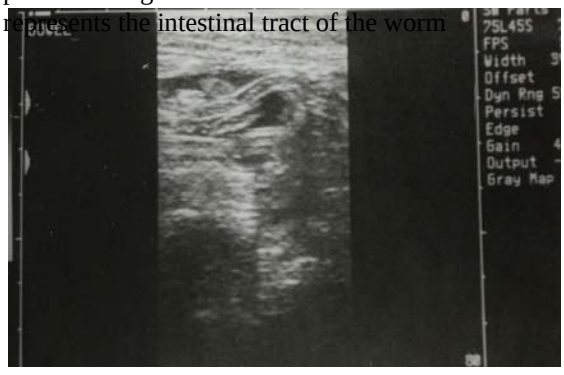

Fig. 2 USG-intestinal ascariasis. Cross-sectional image gives the appearance of "Target Sign".

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Case 2

A 60 year old female admitted with clinical diagnosis of acute cholecystitis. Abdominal USG showed distended gall bladder partially filled with thick sludge containing single, long, linear parallel echogenic stripes without acoustic shadowing suggestive of round worm (fig 3). Ultrasound Murphy's sign was positive, hence a diagnosis of ascaris induced acute cholecystitis was made. Patient was treated conservatively. Follow up scan after a week showed expulsion of the worm and patient was doing well.

Fig. 3 F/60 with clinical features of acute cholecystitis. Round worm in the lumen of the distended gall bladder.

Case 3

A 22-year old female presented with nausea, vomiting and severe pain in right hypochondrium. Pain aggravated by fatty meal. She gave the history of yellowish discoloration of eyes few days back, which subsided spontaneously. On examination patient was ill looking. Vitals were stable. Mild icterus was present. Systemic examination was unremarkable except tenderness in right hypochondrium. Laboratory examination revealed total and direct bilirubin 3.9 mg/dl and 2.4 mg/dl respectively. USG of the abdomen showed multiple tubular structures along the dilated common bile duct and hepatic duct suggesting ascariasis causing biliary colic (Fig 4). Gall bladder was normal. Multiple parallel echogenic strips with central anechoic tube were also seen in the bowel loops. Hence a diagnosis of biliary and intestinal ascariasis was made. After the treatment with antihelminthic drugs and endoscopic extraction of worms, patient improved symptomatically. On follow up she was doing fine.

Fig. 4 Bile duct ascariasis. USG shows markedly dilated common bile duct. Within lumen there are multiple parallel echogenic lines.

Case 4

A 20 year female was subjected for abdominal USG with history of high grade fever, diffuse upper abdominal pain and localized tenderness in right hypochondrium with hepatomegaly. She had recurrent nausea and vomiting in the past. Abdominal ultrasonography showed a large irregular hypoehoic lesion in right lobe of liver suggestive of an abscess and confirmed by aspiration of pus under ultrasound guidance. A coiled up parallel linear echogenic structure was seen within the abscess suggesting an ascaris (Fig 5). In addition, common bile duct was also dilated with multiple worms within as evident by characteristic inner-tube sign. Patient was treated with antibiotics and antihelminthic drugs followed by endoscopic extraction of worms. On follow up patient was absolutely fine.

Fig. 5 Ascaris induced liver abscess. An adult ascaris worm is seen lying within the abscess

Discussion

Infestation with round worm is very common in the tropics and subtropics. The condition is closely linked to the sanitation and thus common in the third world countries. In some areas like Kashmir valley, it has been estimated to be as common as gall stone disease (34.8%) [1]. The worms usually develop in the jejunum and can reach several thousands in number causing bowel obstruction, volvulus, intussusception, appendicitis and even bowel perforation with penetration into the peritoneal cavity [1]. They tend to invade the bile and pancreatic ducts and may cause acute cholecystitis and pancreatitis [1, 2]. USG of the abdomen has been advocated as a quick, safe, non-invasive and relatively inexpensive modality for suspected intestinal or biliary ascariasis and various appearances of round worms have been described as follows[3,4].

a. A thick echogenic strip with a central anechoic tube.
b. Multiple long, linear, parallel echogenic strips without acoustic shadowing.
c. Overlapping longitudinal interfaces in the main bile duct due to coiling of a single worm or several worms in the CBD.

Malde HM et al described the sonographic findings in five paediatric patients with roundworm obstruction. They found the alimentary canal of the worms as a single central echogenic line (when in a collapsed state) or as two parallel hyperechoic bands with a hypoechoic centre when distended [5].

USG examination of the patients in the left lateral decubitus position after ingestion of water improved detection and visualization of the worms [6]. Bhandari Grover et al described the sonographic diagnosis of ascaris induced acute cholecystitis and pancreatitis in a 2 year old girl.[2].

Khuroo et al having studied 500 symptomatic patients, all cases of hepatobiliary ascariasis confirmed on sonography, duodenoscopy, or both found biliary colic (56%), acute cholangitis (24%) and acute cholecystitis (13%) as the predominant clinical presentation [7]. Less common were acute pancreatitis (6%) and hepatic abscess (1%).

In the study done by Javid et al they found ascariasis as the cause of liver abscess in 14.51% of cases in

which the USG was main diagnostic procedure used [8].

In all our cases roundworms were seen as thick echogenic strips with central anechoic tube and they were detected at multiple sites and the presentation was acute abdomen. Worms in the gall bladder lumen are less common, but easily demonstrable on USG, as in the case 3. USG was extremely useful for diagnosis, institution of appropriate therapy and follow up.

Conclusion

Round worm infestation is the common helminthic disease in developing countries with wide spectrum of clinical presentations, one of which can be an acute abdomen. Use of high resolution USG can be helpful in diagnosing the presence of worms, its complications and in evaluating response to treatment.

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