



Computed Tomography Diagnosis of Intestinal Ascariasis: Incidental Finding in a Trauma Patient

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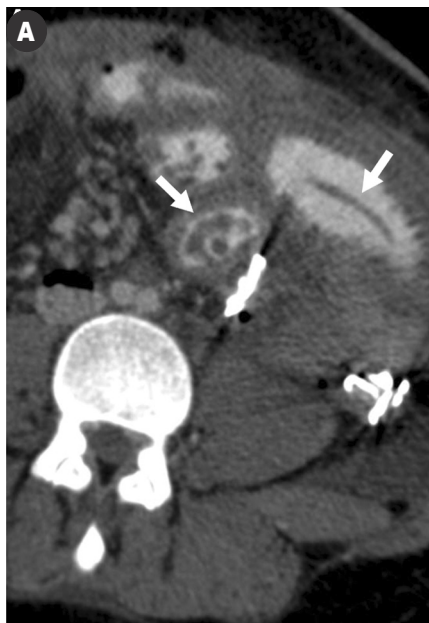
A 17 year old girl was referred to the trauma unit after being involved in a bomb explosion in Gaza. She sustained multiple injuries in her chest, abdomen and pelvis. A contrast-enhanced computed tomography scan of the abdomen revealed an incidental finding of multiple curvilinear tubular and cylindrical filling defects in the intestinal lumen. Some of these structures exhibited a whirled pattern [Figure 1]. These findings were suspicious for an intraluminal intestinal infection with roundworm, which was confirmed at emergency abdominal op-

eration performed for traumatic intestinal perforation.

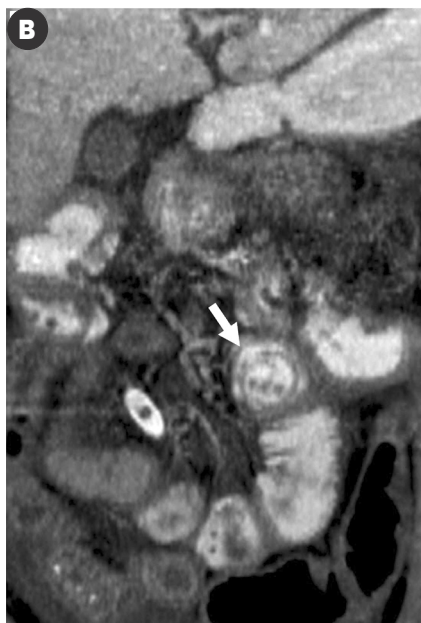
In recent years computed tomography has become increasingly popular. Most adult patients suffering from intestinal ascariasis are asymptomatic or present with non-specific complaints. It is important that radiologists be familiar with the CT findings of this infection since the diagnosis may sometimes be initially suggested by the radiologist.

Ascariasis is the most common helminthic infection affecting humans [1,2]. It is caused by the roundworm *Ascaris lumbricoi-*

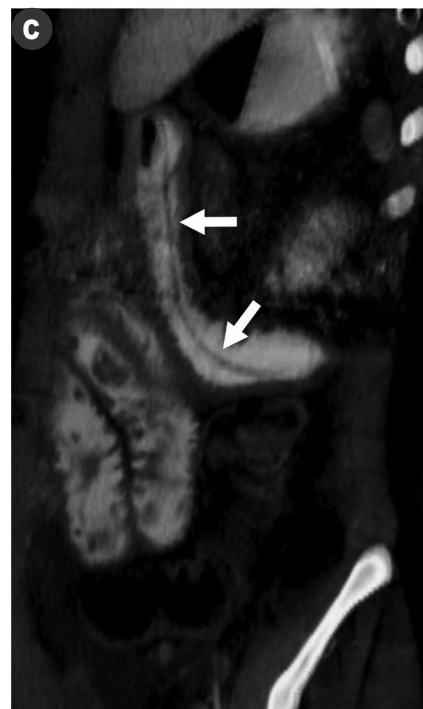
des, which infects approximately 1 billion people worldwide, mainly in tropical and humid rural areas. In the United States more than 4 million people are infected, most of them immigrants. Infections are primarily related to poor sanitary conditions [3]. In Israel, with the increasing number of Israeli travelers to tropical and subtropical areas and with the inadequate sanitary conditions in Gaza and the West Bank, it is important to be familiar with the clinical and radiological signs of this infection.



Axial contrast-enhanced CT scan of the abdomen. Small bowel loops filled with contrast material are seen, containing curvilinear and whirlpool pattern filling defects (arrows) consistent with roundworms.



Oblique coronal maximum intensity projection (MIP) contrast-enhanced CT image demonstrating whirlpool pattern defect (arrow) consistent with roundworms.



Volume rendering thick slab reconstruction showing elongated filling defect (arrows) consistent with a roundworm.

Infection occurs via feco-oral transmission, when hands, water or food are contaminated by soil containing the worm eggs. Subsequent to ingestion, the eggs hatch in the duodenum. The larvae penetrate the intestinal mucosa, reach the liver via the portal vessels and then migrate to the lungs hematogenously, where they cause pulmonary infestations, including eosinophilic pneumonia (Loeffler pneumonia). Larvae may then travel up the tracheobronchial tree and are swallowed, reaching the small intestinal tract where they mature into adult worms. The adult worm lives in the jejunum and middle ileum for 6 months to 1 year. It is 15–35 cm long and may produce up to 200,000 eggs per day. The embryonated eggs are then passed with the feces, preserving the nematode's life cycle [1,3].

The clinical symptoms of ascariasis are related to the number of worms. Most adult patients are asymptomatic, like the case presented here. Large numbers of worms in the intestinal tract may cause abdominal pain, nausea, vomiting or intermittent diarrhea; which may be the manifestations of partial or complete bowel obstruction (the most common complication). Other complications include appendicitis, pancreatitis or cholangitis (due to migration of worms to the

biliary tree or the pancreatic duct) [1,2,4]. Laboratory tests usually include stool for ova and parasites, which demonstrate *Ascaris lumbricoides* eggs [4].

Radiographic evaluation includes plain radiographs, barium studies, ultrasound and CT. Plain abdominal films are usually normal, but may show dilated intestinal loops and air-fluid levels in cases of partial or complete intestinal obstruction. In severe infections the worms may form cords or soft tissue masses contrasted against the gas in the intestinal lumen [1,2].

The use of barium studies in adult patients has decreased significantly in recent years. On barium studies the worm appears as a long, thin, intraluminal filling defect [5]. Sometimes the intestinal tract of the worm is seen as a radio-opaque line, due to ingestion of the barium material by the worm.

On ultrasound the worms are seen as hypo-echoic curvilinear tubular structures with well-defined echogenic walls. Occasionally, curling movements of the worms can be seen [1,4]. Ultrasound is especially helpful in diagnosing hepatobiliary or pancreatic ascariasis

Contrast-enhanced CT findings have been described in several cases of intestinal ascariasis [1,3,5]. The worms may be seen as linear or cylindrical filling

defects in the intestinal lumen [Figure 1]. They may also be organized in masses or demonstrate a whirled pattern.

In conclusion, radiologists should be familiar with the CT findings of intestinal ascariasis, as these could lead to an incidental diagnosis of this infection.

References

1. Rodrigues EJ, Gama MA, Ornstein SM, Anderson WD. Ascariasis causing small bowel volvulus. *Radiographics* 2003;23:1291–3.
2. Villamizar E, Mendez M, Bonilla E, Varon H, de Ontara S. *Ascaris lumbricoides* infestation as a cause of intestinal obstruction in children: experience with 87 cases. *J Pediatr Surg* 1996;3:201–4.
3. Hendi JM, Horton KM, Fishman EK. Ascariasis infection of the colon: MDCT evaluation. *Emerg Radiol* 2006;12:180–1.
4. Bude RO, Bowerman RA. Case 20: Biliary ascariasis. *Radiology* 2000;214:844–7.
5. Hershkovitz D, Wasserberg N. Large bowel obstruction due to *Ascaris lumbricoides*. *IMAJ* 2004;6:115–16.

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