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 operation 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 lumbricoides, 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.
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 pneumonitis). 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

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My belief is that there is nothing in life but refraining from hurting others, and comforting those who are sad

Olive Schreiner (1855-1920), South African author, pacifist and political activist

**Capsule**

**Lung bacterial susceptibility**

The lung epithelia represent a major interface between the host and the outside microbial world and have evolved specific mechanisms to ensure the efficient clearance of pathogens. The importance of these processes is clearly evident in the lungs of cystic fibrosis patients, who are hypersusceptible to infection by Pseudomonas aeruginosa as a result of mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) gene. Kowalski et al. provide evidence that a component of mysterious intracellular structures known as vaults also plays a primary role in the defense against this pathogen. After binding CFTR on epithelial cells, P. aeruginosa induced recruitment of major vault protein (MVP) to lipid rafts at the cell surface and the subsequent internalization of the bacteria. In mice, this MVP-dependent process was required for resistance to infection, which suggests that a similar process may occur in humans.

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