

17-year old male with fevers
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A seventeen-year old male, who recently immigrated to the United States from Bangladesh, presents to the hospital with a ten day history of fevers, myalgias, abdominal pain, nausea, vomiting, and diarrhea. In the emergency department, a fever of 104.2° F was noted. Pertinent labs on admission revealed a white blood cell count of 7,300, hemoglobin of 14, and a platelet count of 256,000. The white blood cell count differential showed 71% neutrophils and 25% lymphocytes. His creatinine was 1.0, and ALT and AST were 85 and 82, respectively. A lumbar puncture performed in the emergency department showed in the CSF analysis 1 WBC, 5 RBC, protein count of 27, and glucose of 64. Influenza antigens and rapid strep test were both negative. Chest x-ray was unremarkable for any active disease. A CT scan of the abdomen and pelvis was performed which revealed significant ileal inflammation as well as prominent small bowel loops with a tubular radiolucent filling defect measuring approximately 15 cm. This finding was suggestive of an intestinal parasite.

The patient was admitted to the hospital where blood cultures, stool studies, and a malaria smear were ordered. Blood cultures were positive for Gram negative rods, consistent with *Salmonella typhi*. Stool cultures were also positive for *Salmonella typhi*. The malaria smear was negative. The patient underwent an upper endoscopy and colonoscopy. Upper endoscopy revealed erosive gastritis. During the colonoscopy, as the endoscope was being passed to the cecum, a worm-like structure was noted in the distal transverse colon. Once the cecum was identified, the ileocecal valve was intubated. Upon further inspection, the distal ileum was found to be severely inflamed, ulcerated, hyperemic, and friable for approximately 15 to 20 cm. Serial biopsies were taken at this site. Upon withdrawal of the colonoscope at the descending colon side of the splenic flexure, was a white, long, worm-like structure which was promptly removed. Biopsies from the colonoscopy showed acute necrotizing ileitis, as well as *Ascaris lumbricoides*. The patient was treated with ivermectin 15 mg orally times for one dose and ciprofloxacin 500 mg twice a day.

In 2008, 449 cases of typhoid fever were reported in the United States. Of the 449 cases, 124 of the cases were found in the Mid-Atlantic region (New Jersey-31, upstate New York-12, New York City-57, Pennsylvania-24). Two hundred and thirty-five of the 449 cases were male, and 208 of the cases were female. Six cases were reported where the sex was not stated. In regards to race, 194 of the 449 cases were Asian or Pacific Islander. Most cases of typhoid fever reported in the United States were primarily a disease of travelers.¹

The CT scan of the abdomen and pelvis was performed due to the patient's complaints of nausea, vomiting, and diarrhea. On the CT scan, there was thickening of the wall of the terminal ileum associated with luminal narrowing. At the time, the findings were consistent with an inflammatory process. Of note was the incidental finding of a tubular contiguous radiolucent filling defect in the jejunum, suggesting the presence of an intestinal parasite.

¹ <http://www.cdc.gov/mmwr/pdf/wk/mm5754.pdf>

The radiographic features of gastrointestinal ascariasis are well known. A literature search was performed and few cases of intestinal ascariasis are diagnosed via CT scan of the abdomen. Beita et al. stated that on an oral contrast enhanced CT of the abdomen, cylindrical filling defects noted within the intestinal lumen represent the roundworms.² The gastrointestinal tract of the *Ascaris* itself is seen as a slender thread of oral contrast within the tubular filling defect.³ Sherman et al., also described a case of ascariasis diagnosed via CT scan of the abdomen with oral contrast. In this case, they also noted a cylindrical filling defect representing the roundworm with a thin line of contrast seen within the filling defect representing the roundworm's own gastrointestinal ingestion of contrast.⁴ Finally, Hommeyer et al., described a case of a 41 year-old Vietnamese female with intermittent mid-abdominal pain for two days.⁵ A CT scan of the abdomen was obtained, revealing a long, thin, tubular soft-tissue structure coiled within the patient's small bowel. Closer evaluation demonstrated a thin column of oral contrast within the gut of the worm.⁶

A literature search was performed to see if any documented cases of co-infections with ascariasis and typhoid fever exist. At this time, no evidence of any cases have been reported. Because international travel and immigration has become increasingly popular, we, as physicians, need to be more cognizant of multiple intestinal infections despite clinical presentations suggestive of a single etiology for many patient's symptoms. Clinicians should remain alert to the possibility of rare and unusual diseases.

This case was presented and found to be very interesting due to the initial patient's presentation of acute enteritis. It is important to keep in mind patients may have co-infections with other bacteria. We present this case as an example of a patient presenting with acute enteritis, and subsequently discovered to have a roundworm infection.

² Beita AO, Haller JO, Kantor A. CT findings in pediatric gastrointestinal ascariasis. *Comput Med Imaging Graph* 1997; 21: 47-49.

³ Beita AO, Haller JO, Kantor A. CT findings in pediatric gastrointestinal ascariasis. *Comput Med Imaging Graph* 1997; 21: 47-49.

⁴ Sherman SC, Weber JM. The CT diagnosis of ascariasis. *Journal of Emergency Medicine* 2005; 28: 471-472.

⁵ Hommeyer SC, Hamill GS, Johnson JA. CT diagnosis of intestinal ascariasis. *Abd Imaging* 1995; 20: 315-316.

⁶ Hommeyer SC, Hamill GS, Johnson JA. CT diagnosis of intestinal ascariasis. *Abd Imaging* 1995; 20: 315-316.