Overt small-intestine bleeding caused by Ancylostoma duodenale

A 74-year-old male farmer with a history of diabetes mellitus and hypertension was admitted to our hospital because of a 2-week history of abdominal pain and melena. On admission, physical examination showed abdominal tenderness without rebound. Laboratory tests revealed a hemoglobin level of 11.0 g/dL (normal 13-17 g/dL) and a white blood cell count of 14,500/mm³ (4000-11,000/mm³), with 4.2% eosinophils (1%-6%). Stool examination showed occult blood and no ova or parasites. EGD revealed duodenal ulcers without stigmata of recent hemorrhage, and these were not believed to be the cause of bleeding. Melena persisted despite treatment with a proton pump inhibitor. Capsule endoscopy (PillCam SB capsule; Given Imaging, Yoqneam, Israel) demonstrated active bleeding in the proximal jejunum and several white worms at the bleeding area (A). Antegrade double-balloon enteroscopy disclosed multiple erosions and red spots in the proximal jejunum. Moreover, several worms were seen to be “dancing” on the intestinal mucosa and sucking blood (B, Video 1, available online at www.giejournal.org). Three worms were extracted endoscopically for further investigation.

Microscopic examination of the extracted worms showed 2 pairs of teeth, confirming a diagnosis of Ancylostoma duodenale (C, merthiolate-iodine formaldehyde, orig. mag. x400). Mebendazole 100 mg twice daily was administered for 3 days. No recurrence of melena has developed after 3 months of follow-up.

DISCLOSURE

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Commentary

Up to 750 million people worldwide are infected with hookworm (both Ancylostoma duodenale and Necator americanus). The first definitive observations of hookworm were made at autopsy in 1838 when Angelo Dubini discovered the nematode, named it, and described its teeth in great detail. Adult A duodenale is grayish white or pinkish with its head slightly bent in a hook-like relation to the rest of its body; it is for this bend that Ancylostoma is named (Greek: angkylos, crooked; stoma, mouth). A duodenale is dioecious (Greek: dioecy, “two households”), meaning there are distinct male and female organisms. The female can excrete up to 30,000 eggs daily in the host stool, and in a warm, moist, and shady soil, eggs hatch in 1 to 2 days, releasing rhabditiform larvae. After 5 to 10 days and 2 molts later, rhabditiform larvae become third-stage infective filariform larvae that can survive 3 to 4 weeks under favorable conditions. Necator can be transmitted only through penetration of the skin, but Ancylostoma can be transmitted percutaneously, orally, and probably transplacentally. When
it is transmitted orally, the early migrations of the larvae cause Wakana disease, which is characterized by nausea, vomiting, pharyngitis, hoarseness, cough, and dyspnea. After penetrating the host’s skin (larva migrans), *Ancylostoma* make their way to the heart and lungs, penetrate the pulmonary alveoli, ascend the bronchial tree, are swallowed, and eventually reach the small intestine, where they can survive for years. Their penchant, once in the small intestine, is to chronically suck blood from small vessels, access to which is provided by their two pairs of ventral teeth that are fused at their bases. Although infestation is generally considered to be asymptomatic, an allergic reaction at the site of skin penetration as well as cough and pneumonitis may precede diarrhea. The major morbidity associated with hookworm, however, is “silent and insidious” damage caused by intestinal blood loss, iron deficiency anemia, and protein malnutrition as the adult hookworms in the small intestine ingest blood, rupture erythrocytes, and degrade hemoglobin in the host. Indeed, hemophagous hookworms are a leading cause of GI blood loss and iron deficiency anemia in the developing world, facilitated by an anticoagulant (serine protease inhibitor) and a protein inhibitor of both platelet aggregation and adhesion. I knew of the filarial “dance sign” in chylous fluid, the dancing worm, loa loa, in the eye, and even the drunken worm dance seen in the mud at outdoor parties during heavy rains, but now I know to listen for the music of the dancing “Old World” nematodes when I do my next EGD on an iron deficient patient.

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