Endoscopic Diagnosis of Hookworm Infection That Caused Anemia in an Elderly Person

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**Summary**

Hookworm infection is a common intestinal nematode in the world. Patients with a light hookworm infection are usually asymptomatic, but a moderate or heavy hookworm burden can result in fatigue, recurrent abdominal pain, and iron-deficiency anemia. We presented a case of a 61-year-old man complain of general malaise and melena for 6 months due to hookworm infection. There is no eosinophilia, and the stool exam only revealed positive of occult blood, without ova or parasite identified. Upper endoscopy revealed several squirming red worms in duodenum. Hookworm (*Ancylostoma duodenale*) infection is diagnosed and eradicated by mebendazole successfully. His anemia is corrected after treatment. Hence, hookworm infection should be noted in elder patients with long term anemia in Taiwan. It is also important to check carefully in the duodenum at routine upper gastrointestinal endoscopy.

**1. Introduction**

Hookworm infection is one of the most common intestinal nematode infection in the world. There are about 740 million infected people in global prevalence, especially underdeveloped countries in the tropics and sub-tropics. Most infected individuals are asymptomatic. A heavy worm burden, a prolonged duration of infection, and an inadequate iron intake may result in iron deficiency anemia (IDA) and hypoproteinemia in heavy infection. The most common species are *Ancylostoma duodenale* and *Necator americanus*. Hookworm infection can be diagnosed by the detection of eggs in feces, and several case reports presented the finding in panendoscopy, colonoscopy, and capsule endoscopy. Because of hygiene improvement in Taiwan in recent decades, there are only some case reports of hookworm infection. However, we should keep the disease in mind because of increasing cross-border female marriage immigrants and foreign workers in Taiwan. We report a case of hookworm (*A duodenale*) infection with general malaise owing to prolonged IDA for 6 months. Anemia was corrected after successful eradication of the parasite infection by mebendazole.

**2. Case Report**

A 61-year-old male farmer complained of general malaise and melena for 6 months. IDA had been diagnosed elsewhere on one occasion 3 years ago, although a definite etiology had not been identified. The endoscopy had shown a small ulcer in the gastric antrum but a normal duodenum 3 months ago. He was treated with a proton pump inhibitor, but the melena persisted. During this time of admission, the physical examination was unremarkable except for mild external hemorrhoids, but there was no evidence of bleeding. The laboratory data were entirely normal except for a hemoglobin of 6.5 g/dL (13.6–17.5 g/dL) and a mean corpuscular volume of 65 fl (88.3–98.0 fl). Stool examination was positive for occult blood, but no ova or parasites were identified. The endoscopy this time showed several squirming red worms swimming in the duodenal bulb to the third portion of duodenum (Fig. 1). Hookworm (*A duodenale*) infection (Figs. 2 and 3) was diagnosed histologically from a specimen obtained endoscopically, but repeat stool examination was still negative. Mebendazole was started immediately, along with iron replacement, resulting in a significant improvement in the hemoglobin to 10.1 g/dL 3 months later.
3. Discussion

We presented a case of an elderly male with long-term IDA history, with an incidental finding of hookworm infection during panendoscopy. Hookworm is first described by an Italian physician, Dubini, in 1838, after an autopsy on a woman in Milan. It is estimated that approximately 740 million people had hookworm infection in the world, and the disease mainly occurs in resource-poor communities in the developing world. The hookworms \textit{A duodenale} and \textit{N americanus} are widespread among humans. \textit{A duodenale} is more geographically restricted, whereas \textit{N americanus} is the most common hookworm worldwide. Hookworm is transmitted through contact with contaminated soil, especially fecal contamination is much more common than the penetration of the skin. The infection rate ranged from 50% to 90% in Taiwan before 1950. Then it decreased to less than 1% after general sanitation and medicine improving.

Human acquired hookworm from the third-stage infective larvae, which hatched and developed in soil from egg in feces. Larvae can penetrate skin and enter bloodstream, then reach heart and enter lung capillaries and alveola spaces about 10 days from hatch. Patients coughed up larvae and swallowed them into the gastrointestinal tract, where the larvae molt twice and develop to the adult stage. Then each female hookworm can produce thousands of eggs daily and repeat the life cycle.

Repeated exposure to third-stage larvae of \textit{N americanus} or \textit{A duodenale} results in a local pruritic, erythematous, papular rash known as “ground itch”.

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barefoot in soil. Fecal examination and endoscopy are suggested for anemia study, and it is especially important to check duodenum carefully during endoscopy. Furthermore, our case suggests that mebendazole is an effective antiworm medication for removal of hookworm, and taking more care of the sanitation surrounding the elderly patients might reduce the infection.

References