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Overt gastrointestinal bleeding because of hookworm infection

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ABSTRACT

Hookworm infection is a relatively common cause of anemia in endemic areas. The most common hookworm species are *Ancylostoma duodenale* and *Necator americanus*. In this report we present a case of overt gastrointestinal bleeding because of hookworm infection. Capsule endoscopy revealed many hookworms in the lumen of proximal jejunum where active bleeding was seen. The patient was successfully treated with Albendazole.

1. Introduction

Hookworm infection is widely distributed in Asia and Africa but can also be found in other tropical and subtropical zones. Most of patients with hookworm infection are asymptomatic or have mild degrees of anemia, overt gastrointestinal bleeding caused by hookworm is very rare. We report a case of overt gastrointestinal bleeding caused by hookworm, whose hookworm infection was diagnosed by capsule endoscopy.

2. Case report

A 53–year–old male patient was admitted due to

intermittent tarry stool with fatigue and shortness of breath for 1 week. On admission, his physical examination showed pale conjunctiva. Laboratory data revealed hemoglobin of 66 g/L (normal: 120–160 g/L), white blood cell count of $5.3 \times 10^9/L$ (normal: $4-10 \times 10^9/L$) and eosinophils percentage of 5.1% (normal: 0%–10%). The patient's fecal occult blood was positive, which suggested gastrointestinal bleeding with anemia. Stool examination revealed no parasite infection. Transfusions of red blood cells were given to maintain his hemoglobin around 95 g/L. After admission, the patient received esophagogastroduodenoscopy and colonoscopy, but the location of bleeding was not identified. Therefore, capsule endoscopy was arranged to identify if there were lesions in the small intestine that caused the blood loss and it revealed many hookworms in the lumen of proximal jejunum where active bleeding was seen (Figure 1, 2). The patient was then treated with albendazole and oral iron supplementation. Both of his hemoglobin and hematocrit were improved to normal range in a follow up visit 2 months later.

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Figure 1. Capsule endoscopy revealing hookworms in the lumen of proximal jejunum where bleeding was caused by the parasites.

3. Discussion

Hookworm infection in human subjects is usually caused by the helminth nematodes *Necator americanus* and *Ancylostoma duodenale*, both of which are strictly human parasites^[1]. Hookworms can be found in approximately 25% of the world's population, especially in poor areas in the tropics and subtropics^[2,3]. Both types of hookworms parasitize in the proximal part of the small intestine. The amount of blood loss caused by hookworms in an adult is about 0.05 to 0.3 mL for *Ancylostoma duodenale* and 0.01 to 0.04 mL for *Necator americanus*^[4]. Most of patients infected by hookworm are asymptomatic or have mild degrees of anemia. Iron deficient anemia is the main adverse outcome of hookworm infection. However, overt gastrointestinal bleeding caused by hookworm is extremely rare. We hypothesized that it might be the hookworms damaging the blood vessel of small intestine that induced the acute massive intestinal bleeding in our case. The diagnosis of hookworm infection is based on the identification of ova in the stool^[5]. However, ova can not be found in stool under microscope in some cases, direct visualization of hookworms in the small bowel also aids in establishing the diagnosis^[6]. The capsule endoscopy has been developed to make a direct

and complete examination of the small bowel in a safe, noninvasive manner and it has become a main method in the diagnosis of suspected diseases of the small bowel^[7]. In some other cases, diagnosis of hookworm infection was also established by capsule endoscopy^[8,9], though the identification of the exact type of hookworm is not easy by just viewing the capsule endoscopy images.

Conflict of interest statement

We declare that we have no conflict of interest.

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