

Endoscopic Diagnosis of Hookworm Infection from Malwa Region, Punjab: A Case Report

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ABSTRACT

Hookworm is one of the important soil-transmitted helminthes and is usually diagnosed by characteristic clinical findings such as anaemia and laboratory investigations like blood examination showing eosinophilia and stool microscopic examination showing characteristic egg morphology. A 40-year-old man complained of epigastric pain and passage of black coloured stools for 2 months. There was no eosinophilia and stool was positive for occult blood but no helminthic egg was detected microscopically. Under the impression of peptic ulcer disease with chronic blood loss, upper gastrointestinal endoscopy was performed. Many worms were found in the duodenum incidentally by endoscopy & were identified as *Necator americanus* and successfully eradicated by mebendazole treatment. It is always crucial to do repeated stool examinations and to observe the duodenum carefully by endoscopy where parasite infestation is suspected clinically.

Keywords: Endoscopy, hookworm, duodenum

INTRODUCTION

Hookworm is one of the important soil-transmitted helminthes (STH) for humans around the world. About 740 million people are estimated to be infected by hookworm worldwide, especially in underdeveloped countries of the tropics and subtropics.¹ Most of the infected individuals are asymptomatic. A heavy worm burden, a prolonged duration of infection and an inadequate iron intake may result in iron deficiency anaemia (IDA) and hypoproteinemia.² Hookworm infections are usually diagnosed by characteristic clinical findings such as anaemia and laboratory investigations like blood examination showing eosinophilia and stool microscopic examination showing characteristic egg morphology. The diagnostic yield can be increased using stool concentration or stool culture but these are cumbersome and time consuming.³

There are several reports of hookworm diagnosis by means of endoscopy, colonoscopy and capsule endoscopy, however, there is paucity of published data on hookworm diagnosis by endoscopy in India. Here, we report an unusual case from Punjab, Northern India, in which endoscopy distinctly demonstrated the hookworm penetrating the duodenal wall.

CASE REPORT

A 40-year-old male patient complained of epigastric pain and passage of black coloured stools for last 2 months. As told by the patient, pain used to aggravate after meals and there was history of weight loss approximately 6-7 kg in two months. He was referred to our hospital due to severe anaemia. Physical examination was unremarkable except for extreme pallor. The laboratory data were entirely normal except for haemoglobin of 6.1 g/dL (13.6 - 17.5 g/dL) and hematocrit: 21% (36-50%). There was no eosinophilia (2%, normal <5%). Routine stool examination showed positive occult blood but there was no helminthic egg detected microscopically even on repeated examination. Liver and renal function tests and electrolytes were within normal limits. Under the impression of peptic ulcer disease with chronic blood loss, upper endoscopy was performed. There was no particular finding in oesophagus and stomach, but multiple small worms

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Fig.1 : Microscopic examination showing anterior and posterior end of male hookworm.

measuring 4-6 mm in length were found penetrating the duodenal wall. They were removed by using biopsy forceps and were sent to microbiology department for identification. These worms were identified as male adult hookworms of *Necator americanus*. (Fig. 1) The patient was treated with oral mebendazole (100 mg twice a day for three days). Routine stool examination one week later still showed no sign of hookworm eggs. Endoscopic examination 2 weeks later was also unremarkable. The patient received oral iron supplement for iron-deficiency anaemia and hematocrit improved from 21% to 37.7% within a month. Significant improvement in the haemoglobin was seen from 6.1 g/dl to 12.5 g/dl after 3 months. The patient remained asymptomatic till last follow up.

DISCUSSION

Hookworm is one of the most common parasites in the world. Approximately 7% of Indian population is estimated to be infested with hookworms.⁴ In a study done by Nitin S *et al*⁵ in Lucknow, North India, the prevalence of hookworm was found to be 2.4%. It is a common cause of occult gastrointestinal bleeding and anaemia especially in the tropical countries. There are two human-specific hookworms, namely *Ancylostoma duodenale* and *Necator americanus*, distinguished from each other by the morphological differences of their mouth capsules, bursae and spicules. Usually, the diagnosis is made by the characteristic clinical findings and eosinophilia and characteristic egg appearance on faecal examination.⁶ However, diagnosis is often missed due to the absence of eggs of the parasites in stools or eosinophilia. In our case also, we could not find any ova during the faecal examination & eosinophil count was

normal. Because of positive occult blood in stool, endoscopic examination was planned that revealed the presence of hookworms in the duodenum which was completely an unexpected finding.

Upper endoscopy is a very important tool for diagnosis of gastrointestinal problems, and there are some reports of hookworm diagnosis by means of routine upper endoscopy.^{2,7-11} If present, these parasites usually live in the upper part of the small intestine but relatively few in the duodenum.^{2,8,9,11}

Gastrointestinal blood loss associated with hookworm infestation is always occult but massive bleeding is uncommon.^{10,12,13} Each worm sucks between 0.1 and 0.4 ml of blood/day. It can be responsible for a daily blood loss up to 250 ml/day in heavy infection. The severity of blood loss in hookworm disease depends on the acuteness and magnitude of infestation. Acute heavy infection is usually presented as bloody or tarry stools, whereas chronic infestation is usually associated with occult bleeding.

Improved sanitation, hygiene and chemotherapy have made hookworm infestation a rarity in developed countries, but it is still prevalent in developing countries like India. Although it is less common than other diseases such as gastritis and peptic ulcer disease, parasite infection should always be considered as a differential diagnosis in patients with iron-deficiency anaemia and unexplained gastrointestinal blood loss, especially in poor sanitary areas.

To conclude, repeated faecal examinations and endoscopy are important parameters for the diagnosis of hookworm parasitic infestation which is missed in routine stool microscopic examination. It is always

important to examine duodenum properly during endoscopy.

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