

CASE REPORT

Non-necrotizing colonic granuloma induced by schistosomiasis

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Schistosomiasis is an important parasitic disease with various clinical presentations caused by trematode blood flukes. It can present with asymptomatic, chronic colonic ulcerations, strictures, or inflammatory mass causing bowel obstruction. Intestinal polyps are uncommon and induced by antigens released from the schistosome eggs that trigger a cell-mediated inflammatory response with granuloma formation involving T cells, macrophages, and necrosis. This is very relevant while evaluating chronic intermittent gastrointestinal symptoms and eosinophilia in an immigrant patient from endemic areas of schistosomiasis. Here, we describe a case of chronic intestinal schistosomiasis which was found to have schistosomiasis-induced colonic polyp with non-necrotizing granuloma. With increase in immigrant population from the endemic areas of schistosomiasis in the United States, physicians should be aware of this disease and its various manifestations. Gastroenterologist should keep this as one of the differentials for colonic polyps. Diagnosis and treatment in time prevents further progression of the disease and its complications.

Keywords: *schistosomiasis; colonic polyp; granuloma; parasite; immigrant*

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Schistosomiasis is a trematode blood fluke parasitic infection caused by three major species. *Schistosoma mansoni* is a common disease in Africa, South America, and the Middle Eastern countries. *S. japonicum* is prevalent in Southeast Asia, and *S. haematobium* occurs in Africa and the Middle Eastern countries (1, 2).

Clinical manifestation of schistosomiasis is divided into acute and chronic diseases. Acute conditions include a pruritic rash due to cercarial dermatitis, which is known as swimmer's itch and Katayama fever, symptoms of which are fever, lethargy, malaise, and myalgia. Chronic schistosomiasis may present with intestinal and hepatic schistosomiasis such as fatigue, abdominal pain, diarrhea, or dysentery. The most serious complications are fibrosis, intestinal obstruction, stricture, portal hypertension, splenomegaly, and ascites.

Intestinal polyps are induced by antigens released from the eggs that trigger a cell-mediated inflammatory response with granuloma formation involving T cells and macrophages and necrosis. Inflammatory process is easily reversible at the early stage of the disease, but in the later stages, it is associated with collagen deposition and

fibrosis (3). Colonic polyp in intestinal schistosomiasis is rare. Here, we describe a case of intestinal schistosomiasis with non-necrotizing granuloma formation which is presenting as a colonic polyp.

Case presentation

A 51-year-old female with a past medical history of hypertension and dyslipidemia was referred from her primary care physician to the gastroenterology clinic with complaints of intermittent non-specific abdominal pain for 9 months and mild intermittent watery diarrhea. The patient was an immigrant from Senegal, a country on Africa's west coast, where she was born and lived for more than 30 years, and where schistosomiasis is endemic.

Vital signs were within normal limits. Physical examination revealed soft and non-tender abdomen with normal bowel sounds. No organomegaly was found on palpation. The rest of the physical examinations were within normal limits. Laboratory studies revealed hemoglobin of 13.6 g/dL, hematocrit 41%, mean corpuscular volume 90 fL, white blood cells $9.5 \times 10^9/L$, neutrophil 44.6% (normal = 36–78%), lymphocyte 30.5% (normal = 12–48%), monocyte

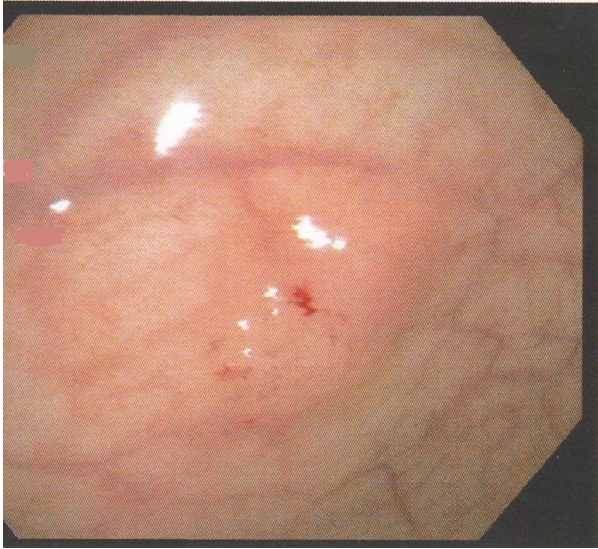


Fig. 1. A polyp in the sigmoid colon found during colonoscopy showing overlying red mucosa.

6.2% (normal = 0–13%), eosinophil 18.0% (normal 0–8%), and basophil count 0.5% (normal 0–2%). Comprehensive metabolic panel was within normal limits. Abdominal ultrasound was normal. The patient underwent colonoscopy, which revealed a sessile polyp in the sigmoid colon measuring about 5–10 mm in size with overlying red mucosa (Fig. 1). Polyp was removed by snare cautery polypectomy.

Hematoxylin and eosin section of the biopsy specimen showed non-neoplastic colonic mucosa and a hyperplastic polyp with multiple focal granuloma formation surrounding *S. mansoni* eggs, which were characterized by prominent lateral spine in the lamina propria and submucosa of the colonic wall with surrounding fibrosis (Fig. 2a–c). Hemorrhage in the submucosa was seen (Fig. 2b). Acid-fast bacilli (AFB) stain and Grocott-Gomori's methenamine silver stain (GMS) were negative.

The first stool samples for ova and parasites were negative. The patient refused to give second sample. Serum *Schistosoma* antibody immunoglobulin G level that uses the microsomal fraction of adult *S. mansoni* worms (MAMA)

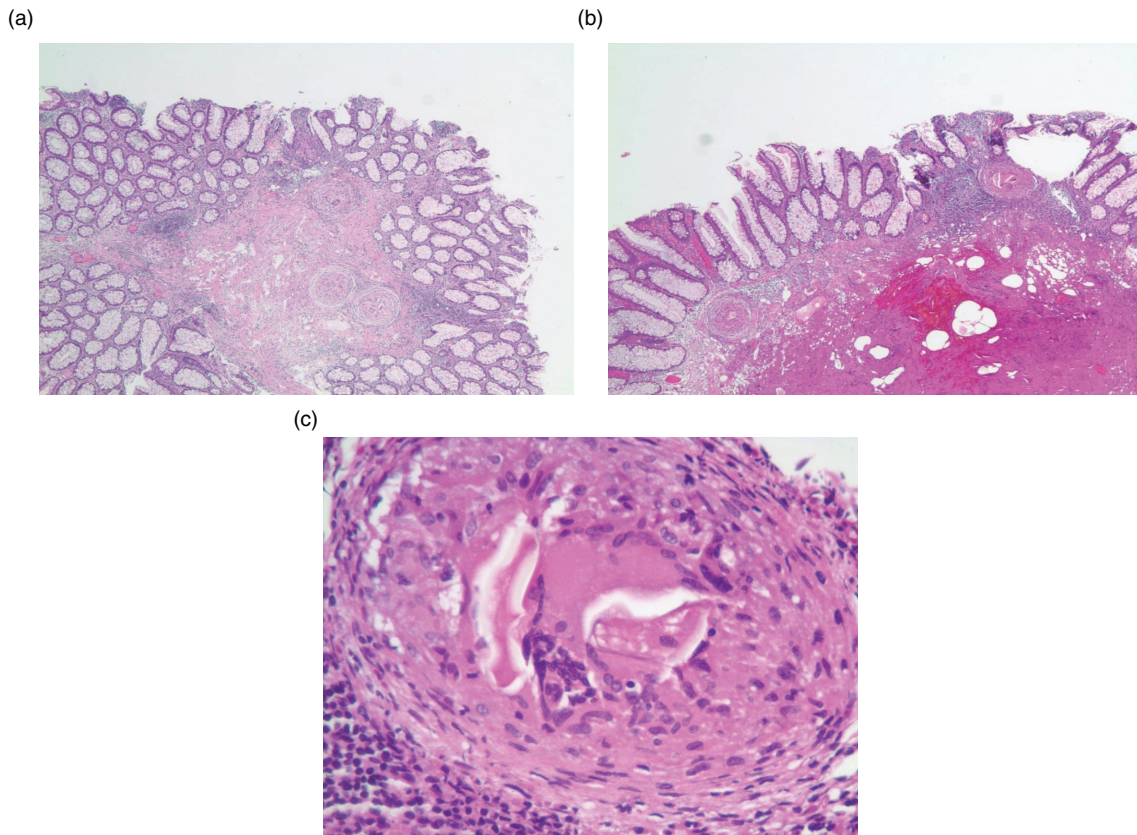


Fig. 2. (a) Low-magnification (4 ×) hematoxylin and eosin section of the 5-mm sigmoid colon biopsy specimen showing multiple focal granuloma formation surrounding *Schistosoma mansoni* eggs in the lamina propria and submucosa of the colonic wall with surrounding fibrosis. (b) Intermediate-magnification (10 ×) hematoxylin and eosin section of the same specimen showing hyperplastic colonic mucosa with focal granuloma formation due to *Schistosoma mansoni* eggs accompanied by hemorrhages in the submucosa. (c) High-magnification (40 ×) hematoxylin and eosin section of the colonic mucosa showing one granuloma with *Schistosoma* eggs with characteristic lateral spine, suggesting of *Schistosoma mansoni*. Surrounding the eggs are fibrosis and chronic inflammatory cells, consistent with chronic colonic schistosomiasis.

as antigen was 2.98 (normal ≤ 1.0). Serum antigen testing was not performed. *S. mansoni* infection was confirmed by colonoscopy, which showed colonic polyp and characteristic granuloma with *Schistosoma* eggs. The patient was treated with praziquantel with resolution of her symptoms.

Discussion

Schistosomal infection in the United States is mostly seen in an immigrant population from endemic areas of schistosomiasis. In acute schistosomal colitis, intact *Schistosoma* ova are deposited in the colonic mucosa accompanying infiltration of eosinophils, lymphocytes, and plasma cells. Chronic schistosomal colitis was characterized by sub-mucosal fibrosis and focal granuloma formation as shown in Fig. 2a and b.

The granulomatous inflammation around eggs is a feature of *S. mansoni* and composed of eosinophils, cluster of differentiated CD4⁺ T helper 2 cells, and macrophages (4). Signs and symptoms of chronic intestinal schistosomiasis may vary from asymptomatic, non-specific abdominal pain, diarrhea and anemia to complications such as bowel strictures, obstructions, or acute appendicitis in rare cases (5–7). Colonoscopic features of intestinal schistosomiasis are non-specific, ranging from edematous and congested mucosa with petechial hemorrhage in acute phase to flat or elevated yellow nodules; polyps and stricture may be seen in chronic cases. Polyps' size may vary from 2 to 20 mm and may be pedunculated, sessile, or cauliflower in shape. Because of severe congestion and focal hemorrhages, the covering mucosa of the polyps is often redder than the surrounding mucosa. Ulcers are usually found in rectal polyps (8).

To increase the sensitivity of stool examination, three samples should be collected on different days because of the intermittent nature of parasite shedding. Our patient was willing to give only one sample, which resulted negative for ova and parasite despite serum antibody for *S. mansoni* was strongly positive. This serology test uses the microsomal fraction of adult *S. mansoni* worms (MAMA) as antigen; therefore, it is highly specific (99%) and sensitive (96%) for detection of infection caused by *S. mansoni*. Furthermore, the histopathology of intestinal biopsy is more sensitive than stool microscopy and may show eggs even with negative multiple stool specimens. In the study by Harries et al. (9) in 135 British expatriates with *S. mansoni* infection, eggs were found on rectal biopsy in about 60% of patients and on stool samples in around 39% of patients. *Schistosoma* eggs in the biopsy specimen is the clue to diagnosis. Schistosomal eggs measure 100–190 μm in width; those of *S. mansoni* are slightly longer than those of *S. japonicum*, and have a characteristic sub-terminal lateral spine. Although *S. mansoni* has the shells with a light brown, translucent appearance, *S. haematobium* contains acid-fast material. It is the distinguishing feature if only the shell fragments are present (6, 10).

The drug of choice for the treatment of active schistosomiasis infection by any species is praziquantel, which has a cure rate of around 80%. Surgical management may be needed for fibrotic lesions with intestinal strictures (3).

Conclusion

A high degree of suspicion is required in diagnosing intestinal schistosomiasis in immigrant population from endemic areas when they present with eosinophilia and gastrointestinal symptoms. Physicians should be aware of the various manifestations of this disease to diagnose these cases in time and treat appropriately. Gastroenterology physicians should look for specific signs of intestinal schistosomiasis including colonic polyps as one of the features of *Schistosoma* infection while performing colonoscopy.

Authors' contributions

All authors involved in conception and design of the study and acquisition, analysis, and interpretation of the data, and read and approved the final version of the article.

Conflict of interest and funding

The authors have not received any funding or benefits from industry or elsewhere to conduct this study.

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