Schistosomiasis: A rare cause of acute appendicitis

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ABSTRACT

Schistosomiasis is a water-borne trematode infestation and is one of the most widespread parasitic diseases in the world. Schistosomiasis can affect any organ, but is rare in the appendix. In this paper, the authors report a new case of appendicular schistosomiasis that was incidentally discovered in a 27-year-old male patient from Mali who underwent appendectomy for acute appendicitis. Appendectomy specimens removed from patients with appendicular schistosomiasis often appear macroscopically normal, but histopathological analysis of these cases confirms the diagnosis by revealing schistosomal eggs. The authors strongly recommend that all appendectomy specimens be examined histopathologically regardless of whether the specimens are macroscopically normal.

KEY WORDS: Appendicitis, appendix, histopathology, schistosomiasis

INTRODUCTION

Schistosomiasis is a common parasitic disease worldwide. It is endemic in developing countries, and 80% of the cases are detected in Sub-Saharan Africa [1]. The infection manifests itself as a variety of different pathologies, depending on the location of the parasite and its eggs. A rare manifestation is that of a common surgical presentation, acute appendicitis. Appendiceal schistosomiasis is very rare even in endemic regions [2]. In this paper, the authors report a new case of appendiceal schistosomiasis revealed by acute appendicitis.

CASE REPORT

A 27-year-old male from Mali with no particular past medical history, presented with sudden onset of severe abdominal pain of 24 h duration, beginning centrally then moving to the right iliac fossa and associated with several episodes of vomiting. He was tachycardic, apyrexial, and abdominal examination revealed tenderness in the right iliac fossa. A diagnosis of acute appendicitis was made, and the patient underwent an open appendectomy. Macroscopic examination of the surgical specimen revealed a swollen, congested appendix measuring 5 cm × 0.7 cm with feces in the lumen. Histologically, numerous schistosomal eggs were present throughout the appendiceal wall [Figures 1 and 2]. All of the eggs were calcified. Stromal foreign body reaction was also recognized [Figure 3]. The appendix was phlegmonous with severe infiltration of neutrophils and eosinophils. Acute serositis was also noted. A detailed history revealed that the patient had lived in both rural and urban Mali where he had swum in lakes and had experienced episodes of abdominal pain 10 years earlier. An abdominal ultrasound was performed to assess for complications of chronic infection including hepatosplenic disease and urinary obstruction, which was normal. Schistosomal serology was slightly elevated, but there was no evidence of schistosomiasis in the feces or urine. The patient was prescribed praziquantel, an anthelmintic drug used in the treatment of schistosomiasis.

Figure 1: Calcified ova of schistosoma surrounded by inflammatory cell infiltration (hematoxylin and eosin, magnification × 100)
The World Health Organization estimates that 500-600 million people in tropical and subtropical countries are at risk for schistosomiasis and that over 200 million people are infected [3,4]. The species of major global importance are *Schistosoma haematobium*, *Schistosoma mansoni* and *Schistosoma japonicum* [5]. All the three species deposit eggs in the appendix, but schistosomiasis seldom cause appendicitis even in endemic regions [6-8]. In developed countries such as the USA, Japan, and Turkey, schistosomal appendicitis is very rare, with an incidence of 0.2%, 0.34%, and 0.05%, respectively [9-11]. One study reported an incidence of 6.2% in Nigeria, an endemic country [12]. Schistosomiasis is contracted by exposure to contaminate freshwater; schistosome eggs in the water enter a snail intermediate host where they mature then are released back into the water. Here, they penetrate through the skin of a human host and enter the systemic circulation through the pulmonary capillaries [1,2]. In the portal vein, they multiply and travel to veins draining the intestine or bladder where they lay eggs that either stay in the circulation or are shed in the feces or urine [1,2]. Most cases of appendiceal schistosomiasis are seen in the second and third decades of life, with a peak incidence in the third decade [13]. Our patient was 27-year-old. Abdominal pain, vomiting, and fever remain the most common initial symptoms of schistosomal appendicitis. There are no clinical features that can point to the diagnosis preoperatively [1]. Similarly, our patient did not exhibit any specific symptoms pertaining to the presence of schistosomiasis, but had the clinical manifestation of appendicitis. The gold standard of diagnosis is the identification of schistosomal ova by microscopic examination of tissues, urine or stool. Serology can be used to detect mild infections [1]. In our case, the diagnosis of schistosomal appendicitis was reached after histology results revealed the presence of schistosomal ova in the appendix. Stool and urine examined after appendectomy did not demonstrate any eggs. Histologically, the basic lesions of schistosomiasis are foreign body granulomas around eggs or a diffuse polymorphous infiltrate constituted by eosinophils and neutrophils [14]. Plasma cells, lymphocytes, macrophages, and giant cells are also usually present. The granulomas vary in structure and the only pathognomonic feature is the contained eggs. Some eggs are surrounded by a layer of eosinophilic material, the Splendore–Hoeppli phenomenon [14,15]. Schistosomal eggs are readily demonstrable under hematoxylin and eosin stain [14,15]. Sometimes, special stains could be used to demonstrate schistosoma ova in the tissues. Because the ova are usually surrounded by periodic acid Schiff-positive diastase-resistant materials, these stains can be used [15]. In addition, the egg shells of *S. mansoni* and *Schistosoma intercalatum* are acid fast while those of *S. haematobium* are not [14,15]. In the present report, special stains were not performed due to the fact that schistosoma ova were easily demonstrated morphologically in the tissue sections stained with hematoxylin and eosin. The actual role of infestation as a contributing factor to the development of appendicitis is still open to debate and has been the subject of much controversy [16]. However, it is thought that appendiceal schistosomiasis may cause acute appendicitis. This may be due to ischemic changes caused by egg emboli. This situation may diminish mucosal immunity, thus leading to bacterial infection [16]. Some authors believe that the disease manifestation is due to chronic schistosomal granulomatous inflammation, fibrosis, narrowing of the lumen, and swelling of the bowel wall thus leading to secondary obstruction and acute appendicitis. [8,9]. Treatment of schistosomal appendicitis is based on appendectomy and an anthelmintic drug [1,9]. Chronic schistosomiasis can lead to life-limiting complications, yet a simple treatment can eradicate the parasite and prevent the sequelae [1,9]. Schistosomal appendicitis may be the only presentation of the infection and diagnosis allows investigation of long-term effects and treatment.

**CONCLUSION**

The routine histopathological examination of the appendix is of value for identifying unsuspected conditions namely schistosomiasis requiring further postoperative management.
Gross examination does not appear to be a good indicator of schistosomiasis. The gold standard of diagnosis is the identification of schistosomal ova by histological examination of tissues, urine or feces. We emphasize and strongly recommend that all appendectomy specimens be examined histopathologically regardless of whether the specimens are macroscopically normal.

REFERENCES

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