Case Report

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Atypical perforated appendicitis secondary to schistosomiasis: a rare case report

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Introduction: Schistosomiasis is the second most common parasite disease after malaria and a rare cause of appendicitis. It has been well-documented in the literature that schistosomiasis infection can have several multisystem effects. The unusual condition known as schistosomal appendicitis was initially described by Turner.

Case presentation: We present a 48-year-old man with perforated appendicitis and schistosomiasis-like radiological findings. An appendectomy was performed, and schistosomiasis was confirmed by a histological study of the excised appendix. Praziquantel was administered in a single dosage.

Conclusion: Although schistosomiasis is a rare cause of appendicitis and is very prevalent in developing nations, it should be considered when managing the condition. Anti-shistosoma drugs, which are not frequently used in post-appendectomy cases, should also be considered in the management.

Keywords: appendicitis, case report, schistosomiasis

Introduction

Schistosomiasis is a parasitic infection caused by trematodes or flukes such as *Schistosoma haematobium*, *Schistosoma mansoni*, and *Schistosoma japonicum*. Schistosomiasis is the second most common parasite illness, behind malaria, affecting roughly 200 million people in 74 countries[1,2]. Intestinal schistosomiasis has been reported in practically every area of the human body, with migrating ectopic eggs being the most common cause of illness[3]. The major blood fluke species are found in the intestines. Mansoni, japonicum, mekongi, genuineness, and intercalatum are examples of intestinal Schistosoma species[4]. In 1909, Turner published the first description of Schistosomal appendicitis. According to reports, the incidence ranges from 0.175 to 2%[1]. We describe a case of schistosomiasis-related perforated appendicitis.

HIGHLIGHTS

- Schistosomiasis is a rare cause of appendicitis, and it may be associated with urogenital bilharziasis.
- Schistosoma appendicitis should be considered when dealing with patients from endemic areas.
- Computed tomography of classic urogenital findings in cases of appendicitis may help the diagnosis, but it is inconclusive.
- Histopathological confirmation is necessary for a definite diagnosis of schistosomiasis relighted appendicitis.

Case report

A 48-year-old man came in with right lower quadrant abdominal pain that had started a few days before and was becoming worse. In addition, he has a low-grade fever, nausea, vomiting, and constipation. He had not had any previous medical, surgical, or chronic disease experience. A febrile condition was discovered on physical examination, along with right lower quadrant discomfort and symptoms of peritonitis such as guarding and rebound tenderness. Leukocytosis (13×10^9/l), elevated C-reactive protein (194 mg/dl), and slight elevations in liver enzymes [AST (aspartate aminotransferase): 70 mg/dl, ALT (alanine aminotransferase): 60 mg/dl] were discovered in laboratory testing. Urea and creatinine were in normal ranges. Abdominal ultrasonography revealed inflammation in the right lower quadrant with a 41×40 mm hypoechoic dense collection consistent with an abscess.

A contrast-enhanced computed tomography scan revealed an enlarged appendix size of 10 mm and a 4×4 cm hypodense collection with peripheral enhancement. The preoperative diagnosis was perforated appendicitis with peri-appendicular abscess development. Significant calcification of the urinary bladder and proximal ureter wall was seen on computed tomography, leading to hydroureteronephrosis. These findings pointed to schistosomiasis of the urinary tract (Fig. 1).

Under general anesthesia, an emergency laparotomy revealed an inflamed appendix with tip perforation and peri-appendicular abscess. An appendectomy was performed after washing. Histopathological examination of the appendix revealed viable Schistosoma eggs as well as extensive suppurative inflammation

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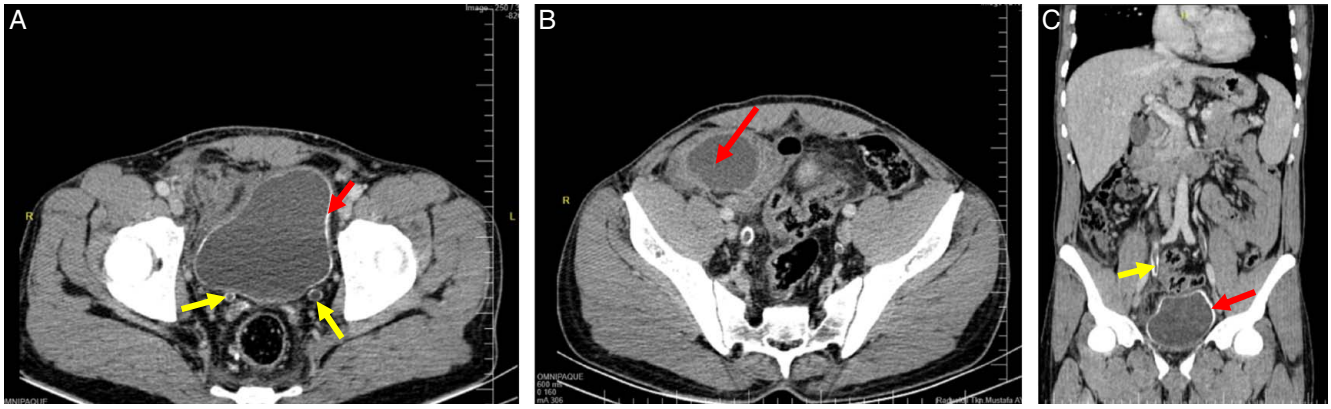

Figure 1. Axial contrast-enhanced abdominopelvic computed tomography shows (A) Extensive calcification of the urinary bladder (red arrow) and both ureter walls (yellow arrow). (B) An abscess cavity containing hypodense fluid posterior to the terminal ileum (red arrow); fat stranding surrounds this collection, and the appendix is not clearly identified. (C) Coronal contrast-enhanced abdominopelvic computed tomography shows extensive calcification of the urinary bladder (red arrow) and both ureter walls (yellow arrow).

with many eosinophils and neutrophils (Fig. 2A, B). For the treatment of schistosomiasis, a single dosage of praziquantel is administered. The patient was discharged after an uneventful operation.

Discussion

Schistosomiasis, often known as Bilharzia, is a tropical parasitic illness caused by blood-feeding Schistosoma worms. *S. haematobium*, *S. japonicum*, *S. mansoni*, *S. intercalatum*, and *S. mekongi* are the most common schistosomes infecting humans[1]. Schistosomiasis is most common in Sub-Saharan Africa, and the World Health Organization (WHO) estimates that about 260 million individuals needed treatment for schistosomiasis in 2014, with more than 123 million (47.6%) being school-aged children (5–14 years old)[5,6].

Contact with contaminated water sources is the most common mode of transmission. It is linked to inadequate personal hygiene and sanitation in the environment. When larval forms of the parasite secreted by freshwater snails come into contact with contaminated water, they infect the skin. Schistosomiasis is estimated to cause around 200 000 fatalities each year in Sub-Saharan Africa, according to a review of the disease's burden[1,2,3].

Schistosomiasis can be categorized into intestinal or urogenital types. The major species of blood fluke may be found in the intestines. The primary species of blood fluke may be found in the intestine. Mansoni, japonicum, mekongi, genuineness, and intercalatum are intestinal Schistosoma species[3]. These species are capable of laying eggs in the appendix. These species, however, infrequently cause appendicitis[3].

There are two forms of schistosomal appendicitis, each with its pathogenic mechanism. First, 'granulomatous acute appendicitis' is produced by an immune granulomatous reaction to freshly deposited eggs, with tissue necrosis and tissue eosinophilia; it can happen quickly within weeks of infection. Second, 'obstructive acute appendicitis' is produced by long-term inflammation and fibrosis surrounding dead eggs, which obstructs the appendiceal lumen and increases the risk of infection from fecal pollutants; this can happen months or years later[1,4,5].

Infection with schistosomiasis can result in a variety of multisystem consequences, which have been widely documented in the literature[5]. They multiply in the portal vein and move to veins, draining the gut or bladder, where they lay eggs that remain in circulation or are excreted in the feces or urine. The eggs cause a granulomatous inflammatory response, which results in the formation of granulomata and tissue fibrosis. The clinical symptoms vary depending on where the inflammatory response occurs, such as colonic polyposis induced by gut wall inflammation, liver fibrosis-producing portal hypertension, and hematuria or obstructive uropathy caused by bladder involvement[6].

The results of computed tomography cannot distinguish acute appendicitis caused by Schistosoma species from other causes. The gold standard for detecting schistosomal eggs in urine or feces is microscopic examination[1]. On axial computed tomography scans, fine ureteric calcification can be detected in a circular pattern, whereas chronic urinary tract schistosomiasis patients have a calcified bladder wall that looks like a fetal head in the pelvis. In cases of urinary schistosomiasis, these radiologic imaging features are pathognomonic[7]. Also, the causes of appendicitis cannot be differentiated in imaging; our case had radiological features indicative of urinary schistosomiasis, raising the possibility of schistosomal appendicitis.

Due to the lack of pathognomonic clinical or operational signs, confirmation of schistosomal organ involvement is generally confirmed by histological diagnosis[8,9]. Schistosomal infections are easily treated with inexpensive medicines. Praziquantel (PZQ) is the backbone of therapy, with a suggested standard dosage of 40 mg/kg body weight in a single dose[1,9].

Conclusion

Appendicitis is quite common, and determining the cause can be difficult. Radiological investigations can help confirm the diagnosis but often cannot distinguish the causes. Histopathological tests are necessary to determine the specific cause. In most cases, surgical treatment is standard care for appendicitis. Schistosoma appendicitis should be considered when dealing with patients from endemic areas. Praziquantel is recommended as an adjunct to surgery.

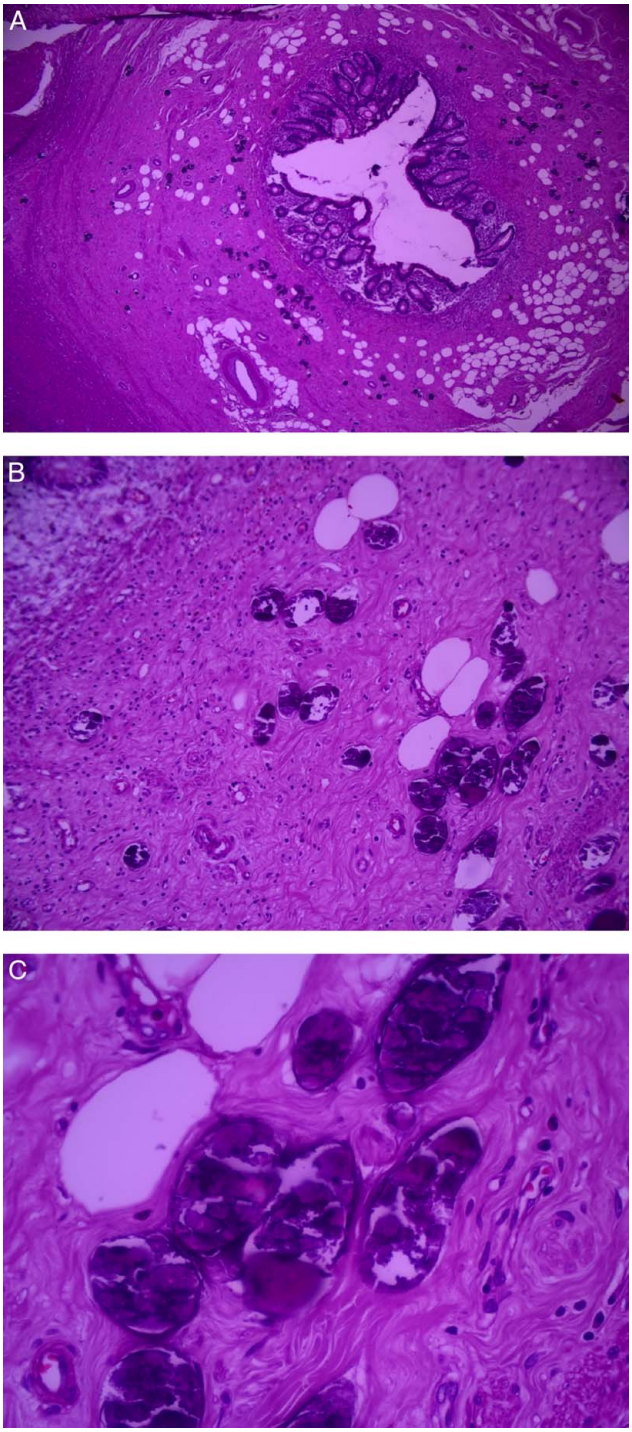

Figure 2. (A) Four times magnification, hematoxylin and eosin show numerous calcified Schistosoma eggs scattered submucosa and muscularis propria with chronic inflammatory cells, predominantly eosinophils in the mucosa and submucosa. (B, C) Twenty times and sixty times magnification hematoxylin and eosin stain demonstrating numerous calcified Schistosoma eggs scattered in the submucosa and muscularis propria.

Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Consent

Written informed consent was obtained from the patient for the publication of this case report and the accompanying images.

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Author contribution

F.A.O.O.: conceptualization, data curation, visualization, investigation writing, and original draft preparation; Y.G.M.: writing, reviewing, and editing; N.M.S.: supervision and validation; N.M.Y.: writing and reviewing.

Conflicts of interest disclosure

This manuscript has not been submitted to, nor is it under review at, another journal or other publishing venue. The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.

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