

Letter to Editor

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Unexpected schistosomiasis presenting as acute appendicitis in a migrant adult

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Schistosomiasis, although uncommon in Italy, is one of the most widespread parasitic diseases worldwide, especially in well-defined endemic geographic areas. It usually affects the bladder or intestine, causing hemorrhagic lesions and fibrosis. However, schistosomal eggs can also be detected in unusual locations, including the appendix, where symptomatic lesions can develop. Although described over a century ago, appendicular schistosomiasis remains an important differential diagnosis for abdominal pain in patients from, or having recently traveled to, endemic areas. We recommend having a high degree of clinical suspect of schistosomal infection in the differential diagnosis of appendicitis, in patients from endemic areas or travelers from endemic areas.

Here, we report a rare case of acute gangrenous appendicitis associated with the detection of *Schistosoma* (*S.*) *mansoni* eggs in the histological examination, in a 25-year-old man from Burkina Faso, resident in Italy for two years. The migrant was hospitalized for suspected acute appendicitis. The patient reported having always been in good health both in Africa and during his brief stay in Italy. However, for several days, he had begun to experience worsening abdominal pain, predominantly localized in the right iliac fossa, associated with nausea, vomiting, and high fever. Diagnostic tests and laboratory parameters, combined with the clinical picture, appeared suggestive of acute appendicitis, requiring emergency surgery. The patient therefore underwent appendectomy and drainage of a peritocolic gutter abscess.

Macroscopic examination revealed an 8-cm-long vermiform appendix with a markedly dilated and whitish base. Microscopic examination documented a vermiform appendix with marked acute inflammation of the wall and signs of perivisceral abscessation. Roundish structures were observed within the wall, within which *S. mansoni* eggs were identified. A diagnosis of acute appendicitis with perivisceritis likely due to *S. mansonii* infection was made. A parasitological examination of the stool was negative. Treatment with antibiotics and praziquantel resulted in the patient's complete recovery, and subsequent clinical and laboratory follow-up tests ruled out persistent intestinal or urinary parasitosis.

Appendicitis is the most common surgical emergency worldwide, especially in children[1]. Most cases arise from fecal stasis, fecaliths, and lymphoid hyperplasia; however, appendicitis can rarely be secondary to intestinal parasitic infections[2]. The role of various parasitic infections in the occurrence of appendicitis is illustrated through cases recorded all over the world, including cases arising from infections caused by *Entameba histolytica*, *Giardia lamblia*, and *Trichuris trichiura*.

In a systematic literature search to retrieve articles reporting the prevalence of parasites in appendectomy specimens[2], the pooled prevalence of *S. mansoni* in appendectomy samples was 0.025% (0.274% in Africa, 0.031% in Asia, and 0.001% in Europe. Totally, 28 studies reported *S. mansoni* infection in appendectomy

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specimens, and the pooled prevalence of *S. mansoni* resulted to be 0.025%[2].

Schistosome-associated appendicitis (SAA), first described by Turner in 1909 and subsequently reported in endemic areas, is a rare cause of acute appendicitis where parasitic Schistosoma eggs deposit in the submucosa and serosa. SAA is characterized by eosinophilic necrosis and granulomatous inflammation around the eggs; however, secondary cases may also occur due to obstruction of the appendix caused by persistent inflammatory reaction with fibrosis and calcification of the eggs in the appendiceal wall.

SAA does not present symptoms distinguishable from other forms and causes of appendicitis, but in non-endemic areas it is nevertheless rare, making its clinical recognition difficult before the histological outcome on surgical specimens. In these cases, urgent surgical treatment must be associated with anthelmintic therapy[3].

Schistosomiasis may be a complication of pregnancy in endemic areas, because the congestion of the pelvic vessels during pregnancy facilitates the passage of eggs into the intestinal villae and intervillous spaces with lodgement in the appendix and subsequent inflammation[4].

It has been suggested in presence of a macroscopic appendiceal picture characterized by pseudotumorous appendix and lymph node masses, in conditions of poor epidemiological information in the clinical history evaluated in emergency conditions, frozen section biopsies may help to establish the diagnosis and thus avoid unjustified bowel resection[5].

Human schistosomiasis is a chronic parasitic disease caused by helminth parasites of the genus *Schistosoma*, prevalent in sub-Saharan Africa[6], causing severe and debilitating outcomes, some of which are recognized at an advanced stage, such as portal hypertension with variceal bleeding, bladder cancer, and hydroureteronephrosis.

Since 2011, some Mediterranean countries have become major crossroads for migrants and refugees, many from countries where schistosomiasis is endemic. In Italy, several studies have been conducted on schistosomiasis screening in African migrants, which have shown a high prevalence in this population, such as the study conducted by the National Institute for Health, Migration and Poverty in Rome and the IRCCS Negrar in 2019-2020, which found a 31% prevalence of schistosomiasis infection in a large population of African migrants residing in Italy, particularly migrants from West Africa.

Overall, experts believe there is an underdiagnosis of schistosomiasis among migrants in Europe and support the need to instill greater clinical suspicion among health professionals when evaluating migrants arriving in non-endemic hospitals. Recently, the Italian Society of Tropical Medicine and Global Health developed recommendations on screening for neglected diseases including schistosomiasis and its treatment for migrants in Italy.

The aim of this report is primarily to draw attention to this neglected and difficult-to-diagnose parasitic disease in non-endemic areas. The case described demonstrates the potential initial diagnostic difficulties and suggests the need to raise the suspicion of schistosomiasis even in cases of appendicitis, both in immigrants to Italy and in international travellers from endemic areas, especially considering the likely increasing spread of this parasitic disease in Western European countries in the coming years. It highlights the importance of maintaining a high index of suspicion for parasitic infections in this population, even in the absence of classical laboratory indicators such as eosinophilia. Early recognition and prompt treatment with praziquantel are crucial to prevent long-term complications, including hepatic fibrosis (caused by *S. mansoni*) and urinary tract malignancy (caused by *S. haematobium*).

Conflict of interest statement

The authors declare no conflict of interest.

Patients' consent

The patients described in the current manuscript have not been reported in any other submission. Written informed consent for publication was obtained from all patients. The case study was approved by the Local Advisory Board.

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Authors' contributions

AM and RM: reviewed the literature and wrote the manuscript; SG, SDC, VV, LC, LB, GG, provided clinical data. All authors gave final approval for publication.

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