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Case Report

Radiology Section

Appendicitis with Calcified Schistosome Eggs in a 73-year-old Female: A Case Report

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ABSTRACT

Schistosomal appendicitis is an uncommon manifestation of chronic schistosomiasis, typically resulting from egg-induced granulomatous inflammation and luminal obstruction. Although most cases are reported in endemic areas, delayed presentations in non endemic settings are increasingly recognised due to global migration. Hereby, the authors present a rare case of appendicitis with calcified schistosome eggs identified in the appendix of a 73-year-old female residing in the USA. While schistosomiasis more commonly affects younger males in endemic regions, the present case highlights a delayed presentation of appendicitis decades after suspected exposure in the Philippines. The present case underscores the importance of considering atypical causes of appendicitis in non endemic regions, particularly in older patients with relevant travel history. It also highlights how global migration may contribute to the delayed identification of prior parasitic infections, emphasising the role of multidisciplinary collaboration in accurate diagnosis and management.

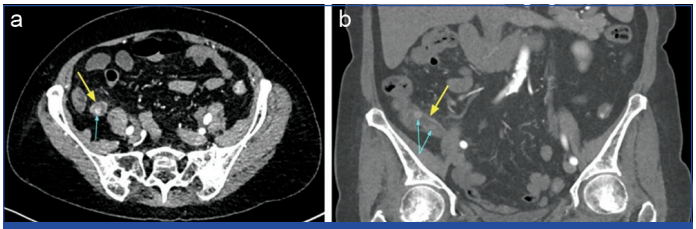
Keywords: Calcified parasitic eggs, Histopathology, Non endemic presentation, Parasitic diseases, Radiologic-pathologic correlation, Schistosomiasis, Travel-related infection

CASE REPORT

A 73-year-old female presented to the emergency department with a one-day history of intermittent, sharp, non radiating epigastric and Right Lower Quadrant (RLQ) abdominal pain, rated 8/10 in intensity and unresponsive to oral acetaminophen. She also reported mild nausea without emesis. The patient appeared uncomfortable but was haemodynamically stable and her vital signs were within normal limits.

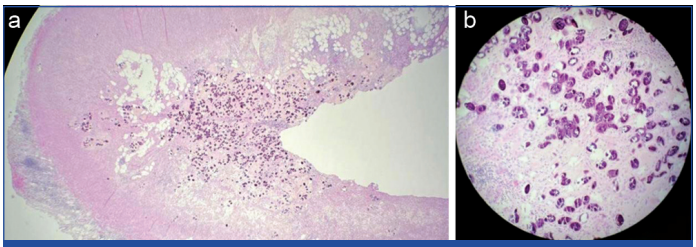
The patient had no significant past medical, surgical, or family history. However, she was born and raised in the Philippines and had visited the region within the past year. She recalled playing in streams and mud as a child but denied any recent freshwater exposure or prior history of schistosomiasis.

On physical examination, she had moderate epigastric tenderness and mild RLQ tenderness without rebound tenderness, guarding, or peritoneal signs. Laboratory studies, including a complete blood count, metabolic panel and urinalysis, were unremarkable. Given a self-reported history of abdominal aortic aneurysm, a contrast-enhanced Computed Tomography (CT) angiogram was performed to evaluate for aneurysm-related complications. While no aneurysm or dissection was noted, imaging revealed a dilated, fluid-filled appendix with at least four intraluminal appendicoliths and mild periappendiceal inflammatory stranding [Table/Fig-1a,b], consistent with uncomplicated appendicitis.



[Table/Fig-1]: Cross-sectional axial (a) and coronal (b) CT images through the lower abdominal quadrant show a dilated appendix measuring 12 mm in caliber, with associated periappendiceal inflammatory stranding, appendiceal wall hyperenhancement (yellow arrow) and multiple appendicoliths (cyan arrows).

The patient underwent an uncomplicated laparoscopic appendectomy and histopathology confirmed acute appendicitis with periappendicitis and calcified parasitic eggs consistent with schistosomiasis [Table/Fig-2a,b]. An infectious disease physician was consulted on an outpatient basis to assess for active infection. Three stool samples tested negative for ova and parasites, excluding active infection and negating the need for further infectious disease treatment. The patient was discharged home the following day and no additional follow-up was required.



[Table/Fig-2]: A 4x magnification: (a) and 20x magnification (b) haematoxylin and eosin-stained images showing clusters of calcified oval schistosome eggs embedded within the appendiceal wall, accompanied by chronic inflammatory infiltrates and fibrosis.

DISCUSSION

Schistosomiasis is a parasitic disease caused by blood flukes of the genus Schistosoma. Although endemic to regions of Sub-Saharan Africa, China and Southeast Asia, it remains rare in the United States [1]. *S. mansoni* and *S. japonicum* are two of the most common species that infect humans worldwide and typically present with intestinal symptoms. The disease can affect people of all ages; however, school-aged children are more commonly affected [2].

A recent meta-analysis found the prevalence of *S. mansoni* in appendectomy samples to be 0.025% globally, with the majority of cases reported in developing countries [3]. A 2021 literature review revealed that the disease primarily affects younger males, with a male-to-female ratio of approximately 2:1 [4]. A more recent study conducted in the endemic region of China reported an increased incidence, particularly among 60-year-old males [5].

A study conducted in a single hospital in Japan estimated the incidence of schistosomal appendicitis to be 0.32% based on appendicitis samples collected over 10 years [6].

Clinical presentation of schistosomal appendicitis: Schistosomal appendicitis can present across a broad clinical spectrum, ranging

from uncomplicated appendiceal inflammation [7] to more severe cases complicated by peritonitis [8], gangrenous appendicitis [9] and other rare manifestations. While there are reports of schistosomal appendicitis in older males treated in non endemic regions with a very remote history of endemic exposures [10], the present case involves an older female patient.

Significantly, the patient grew up in the Philippines, a region endemic to schistosomiasis. She recalled playing in mud and streams as a child, suggesting that she may have contracted schistosomiasis decades earlier. The chronicity of the infection, with calcified eggs identified years or even decades after initial exposure, is particularly remarkable and rare.

Pathophysiology of acute schistosomal appendicitis: The pathophysiology of acute schistosomal appendicitis in patients with active schistosomiasis is rooted in the host's immune response to the parasite's eggs. Schistosomes have a complex life cycle that involves human tissues and freshwater snails. Infectious larvae (cercariae) penetrate the skin using proteolytic enzymes, migrate through the vasculature and settle in venous systems such as the portal or pelvic veins.

Mature worms produce eggs that secrete proteases and elicit inflammatory responses, enabling migration across intestinal or bladder walls. Eggs trapped in tissues, including the liver and appendix, provoke granulomatous inflammation. In the liver, this can lead to fibrosis and serious complications, while in the appendix, the obstruction of the lumen by eggs and associated granulomas may result in appendicitis [11-13].

Over time, eggs calcify, as seen in this patient, reflecting a chronic and resolved infection rather than active disease. Chronic inflammation and subsequent calcification of the eggs can obstruct the appendiceal lumen, predisposing the patient to bacterial overgrowth, increased intraluminal pressure and eventual appendicitis. In the present case, the process likely unfolded over decades, culminating in the acute presentation of appendicitis.

Radiologic findings and considerations: The radiologic findings in the present case warrant further consideration. While CT imaging demonstrated hyperenhancement of the appendiceal wall, it is possible that this apparent "hyperenhancement" reflects mural calcifications rather than true contrast enhancement, a rare but reported feature in chronic schistosomal infections. A recent study on schistosomal appendicitis described punctate mural calcifications and luminal dilatation as common CT findings, often in the context of chronic inflammation [14]. These subtle features may be easily overlooked in non endemic settings.

Similarly, the multiple appendicoliths observed on CT in this patient may not represent typical calcified fecaliths but rather clusters of schistosome eggs, as suggested by subsequent pathology findings. Although also rare, several primary appendiceal conditions may produce a dilated appendix with calcifications that mimic appendicoliths. These include mucinous neoplasms such as cystadenomas and cystadenocarcinomas, which may present with curvilinear mural calcification, as well as certain neuroendocrine tumors such as goblet cell carcinoids, which may occasionally calcify and obstruct the lumen [15]. Although these interpretations remain speculative without direct imaging-pathology correlation, they highlight the importance of maintaining a broad differential diagnosis when atypical radiologic findings are encountered, particularly in patients with prior exposure to schistosomiasis-endemic regions.

Beyond diagnosis, imaging plays a crucial role in anticipating complications. Appendicoliths are associated with a higher risk of perforation, particularly when they obstruct the lumen. Although this patient did not have a perforation, such an outcome could have led to more extensive intra-abdominal involvement. In rare cases, schistosomal appendicitis has been linked to peritoneal inflammation following rupture, with isolated reports describing histologically confirmed schistosome ova on peritoneal surfaces [16]. Mucinous appendiceal neoplasms present a similar challenge, where failure to anticipate rupture can result in significant morbidity, such as pseudomyxoma peritonei [17]. Although distinguishing these entities from uncomplicated appendicitis on imaging may be difficult, the presence of calcifications or atypical features should prompt surgical teams to be aware of the potential for complicated disease.

CONCLUSION(S)

The present case illustrates the unusual presentation of appendicitis with calcified schistosome eggs in a non endemic setting, decades after initial exposure. It highlights the importance of considering parasitic etiologies in appendicitis, particularly in older patients with atypical findings and relevant travel or residency histories. With increasing global migration, clinicians worldwide may encounter more cases of schistosomal disease in non endemic areas, emphasising the need for heightened awareness and collaboration among multidisciplinary teams to ensure accurate diagnosis and management.

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