Case Report

Pulmonary schistosomiasis in a young male: A case report and review of the literature

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Abstract:

Schistosoma is a parasitic infection that affects many people worldwide. However, pulmonary Schistosomiasis is very rare entity which defined as pulmonary involvement develops in persons living or travelling in endemic areas. We report a rare case of 23-year-old Yamani patient admitted as an emergency with a 1-week history of productive cough, hemoptysis, and chest pain. Chest X-ray and computed tomography scan showed right upper lobe peripheral abscess cavity. All routine blood investigations and interventions such as bronchoscopy and bronchoalveolar lavage failed to confirm the diagnosis. However, he underwent right thoracoscopy and excision of this abscess, which unexpectedly showed in the histopathology of the resected specimen *Schistosoma* parasite infection.

Keywords:

Chronic schistosomiasis, pulmonary granulomatosis, pulmonary schistosomiasis

Schistosomiasis is one of the major prevalent neglected tropical diseases as it is recognized by the World Health Organization, which is socioeconomic determined, depending on the geographical distribution of species.[1] *Schistosoma* is a parasitic infection it affects eight hundred million people worldwide where substandard conditions of living are predominant.[2] Globally, it has been reported from 78 countries, with an estimated show that at least 218 million people required preventive treatment in 2015.[1,3] In Yemen widespread of schistosomiasis is common it ranks second public health problem after malaria, with 2–3 million people infected.[1,4] Basically, there are three species of *Schistosoma*; *Schistosoma mansoni*, *Schistosoma japonicum* (intestinal schistosomiasis), and *Schistosoma haematobium* (urogenital schistosomiasis).

In Saudi Arabia, *S. haematobium* and *S. mansoni* are the most common form of infection.[1] Acute Schistosomiasis (Katayama fever) occurs 3–8 weeks after infection and commonly presents with symptoms such as fever, headache, malaise, myalgia, cough, hepatomegaly, splenomegaly, and peripheral eosinophilia.[5] Chronic schistosomiasis is more common than the acute form, and its eggs induced immune reaction with granuloma and fibrotic changes. There might be a pulmonary involvement through portosystemic collaterals or directly from the inferior vena cava in the case of bladder wall schistosomiasis, where eggs can reach the pulmonary circulation. The resulting pulmonary granulomatosis and fibrosis can lead to pulmonary hypertension and frank cor pulmonale with a high mortality rate. Tuberculosis is an important differential diagnosis should be excluded.

In this case report, we present a very rare pathology of pulmonary schistosomiasis in Yemeni patient.

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Case Report

A 23-year-old Yamani patient, smoker, presented to the emergency department complaining of productive cough and hemoptysis associated with chest pain, night sweating and fever for 1 week. However, there was no recent traveling or contact with sick or TB patients.

Physical examination was unremarkable. Laboratory tests showed leukocytosis with eosinophilia predominant (13×10^9/L) and high CRP (55 mg/L). Three sputum samples for acid–fast bacilli smear and culture were negative. Chest X-ray (CXR) and CT scan chest showed right upper lobe peripheral cavitary lesion [Figures 1 and 2].

Fiber-optic bronchoscopy and bronchoalveolar lavage were normal. However, this patient referred to thoracic surgery team to establish a definitive diagnosis. He underwent right thoracoscopy and wedge resection of this abscess cavitary lesion from the right upper lobe. Postoperative recovery was uneventful he was discharged home in a good condition to be followed up in the outpatient clinic.

Histopathology report of the resected abscess cavitary lesion showed fibrosis, inflammation and eosinophilic reaction, with numerous granulomas surrounding parasitic ova, consistent with schistosomiasis infection. [Figure 3a-d].

Discussion

Schistosomiasis is a parasitic disease caused by trematodes (flukes) of the genus *Schistosoma*.

It has other names; such as bilharzias, bilharziasis, or snail fever. Discovered by Theodore Bilharz in 1851.[6]

Schistosomes infect freshwater snails in endemic areas, then snails release Cercariae, a free-swimming larvae survive in fresh water up to 72 h, they either attach to human skin, other mammal or die.

Three main species of *Schistosoma* can infect humans: *S. mansoni*, *S. japonicum* (mesenteric), and *S. haematobium* (vesicular vein).[7]

When cercariae attach to human hosts, it migrates through intact skin to dermal veins, then to pulmonary vasculature. During this migration, they develop lipid bilayers (schistosomula) highly resistant to host immune. When their metabolism shifts to glycolysis, they migrate to the systemic circulation.[8] Schistosomiasis is immunologic reactions to *Schistosoma* eggs trapped in tissues. That cause inflammation, fibrosis, and eosinophilia.[8]

Patients with schistosomiasis commonly present with symptoms such as fever, cough, headache, and urticarial reaction. The treatment of choice for all species of *Schistosoma* is Praziquantel, which is an anti-helminthic drug works by killing sensitive worms. If the patient came with acute presentation, glucocorticoids are considered.[9] Schistosomiasis also can be managed by surgery, if indicated, to remove granulomas, fibrosis, or tumor masses.[10]

A similar case reported by Noémie Coron and others from France have demonstrated that a young French man presented with cough, chest pain, and pruritic rash after a history of travelling. His blood tests showed hypereosinophilia and high CRP. CT scan chest showed multiple bilateral lung nodules with irregular shapes, a biopsy was done, and it showed several epithelioid granulomas around *Schistosoma* eggs, associated with eosinophilic infiltration. The serology was positive for

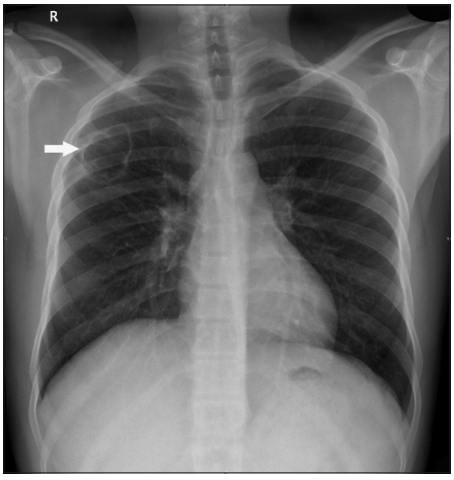

Figure 1: Chest radiography (posteroanterior view) demonstrates right upper lobe peripheral cavitary lesion (arrow)

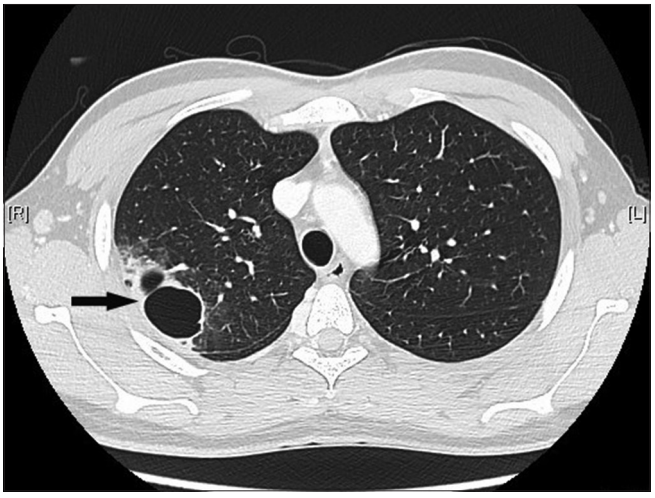

Figure 2: Computed tomography scan of the chest (axial plane) Showing peripheral abscess cavity in the right upper lung (arrow)

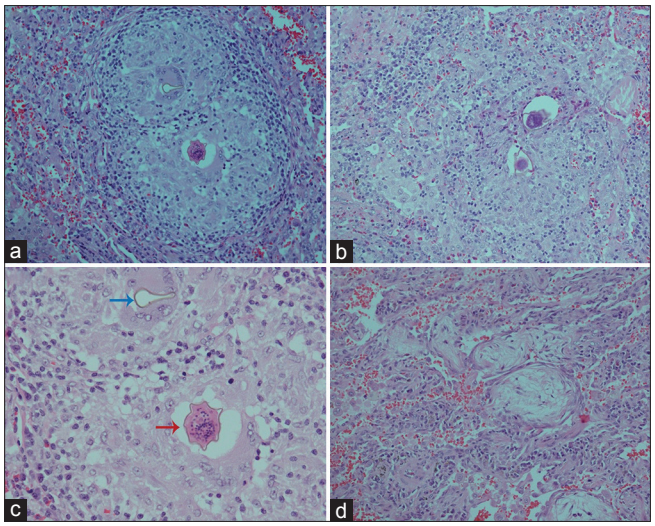

Figure 3: Histological examination of lung specimens. (a and b) these micrographs illustrate *Schistosoma mansoni* ovum surrounded by fibrosis, granulomas inflammation and eosinophilic reaction (H and E, ×200). Micrograph (c) illustrates, at high magnification, the multinucleated giant cells are present (red arrow). The egg have a lateral spine within a well-formed granuloma (blue arrow) (H and E, ×400). As seen in micrograph (d) the surrounding parenchyma shows bronchiolitis obliterans organizing pneumonia-like reaction with extensive infiltrate with eosinophils, plasma cells, and lymphocytes (H and E, ×400)

schistosomiasis. The patient condition has improved after he started praziquantel medication.[11]

Another similar case reported by Niemann *et al*. on pulmonary schistosomiasis, both patients presented with dry cough and eosinophilia. CXR and CT showed a multiple nodular lesion.[12]

In our case, we report unusual findings in presentations and histopathology of the patient presented with undiagnosed right upper lobe abscess cavity, where all the investigations came negative. However, surgical resection of the lesion showed fibrosis, inflammation and eosinophilic reaction, with numerous granulomas surrounding parasitic ova, consistent with schistosomiasis infection. The patient made a good recovery after wedge resection of the abscess cavity and the Praziquantel medication.

Conclusion

Pulmonary schistosomiasis is a very rare entity, difficult to be diagnosed due to the similarity of other diseases such as pulmonary tuberculosis or malaria. However, it could be presented radiologically as pulmonary nodular lesions or very rarely as a cavitary lesion. Nevertheless, if the diagnosed of this entity of pulmonary schistosomiasis done early and treated aggressively with medications and surgical resection; these measures could prevent the patient from further complications.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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