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Vesical Schistosomiasis Mimicking Bladder Disease: A Case Report from Southern Morocco

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Abstract **Case Report**

Schistosomiasis remains a major parasitic disease worldwide and represents the second most prevalent parasitic infection after malaria, affecting more than 200 million people globally, with the highest burden in sub-Saharan Africa [1]. Urinary schistosomiasis, caused by Schistosoma haematobium, is widely distributed in Africa and has historically affected several North African countries, including Morocco [2,3]. Although Morocco has achieved significant progress toward interrupting transmission through national control programs, sporadic and imported cases continue to be reported, particularly in previously endemic regions [3]. Residual transmission foci and increasing population mobility may contribute to occasional new diagnoses [3]. Schistosoma haematobium infection primarily involves the urinary tract, where adult worms reside in the vesical and pelvic venous plexuses. Egg deposition within the bladder wall induces a chronic granulomatous inflammatory response, resulting in mucosal ulceration, fibrosis, calcifications, and, in advanced cases, obstructive uropathy [2,4]. Clinically, urinary schistosomiasis most frequently presents with terminal hematuria, dysuria, and irritative lower urinary tract symptoms [2]. In endemic or formerly endemic settings, bladder schistosomiasis should be considered in the differential diagnosis of hematuria and bladder mass lesions, as it may clinically and radiologically mimic urothelial carcinoma [4,5]. Early recognition is essential to prevent misdiagnosis and to ensure timely initiation of appropriate antiparasitic therapy. We report a case of vesical schistosomiasis diagnosed in Agadir, highlighting the diagnostic challenges and the importance of maintaining clinical suspicion even in regions where transmission has markedly declined.

Keywords: Schistosoma haematobium; urogenital schistosomiasis; vesical schistosomiasis; haematuria; cystoscopy; Morocco; praziquantel.

INTRODUCTION

Schistosomiasis remains one of the most prevalent parasitic diseases worldwide, affecting more than 200 million people, predominantly in tropical and subtropical regions. Among its clinical forms, urogenital schistosomiasis caused by *Schistosoma haematobium* is of particular concern because of its chronic morbidity and potential association with severe urinary tract complications. Although the disease is considered endemic in several African countries, its incidence has markedly declined in North Africa due to extensive public health control programs. Nevertheless, sporadic cases continue to occur, particularly in rural and historically endemic areas, where delayed diagnosis may lead to atypical clinical presentations.

Vesical schistosomiasis is characterized by the deposition of parasite eggs within the bladder wall, leading to chronic granulomatous inflammation, fibrosis, calcifications, and occasionally pseudotumoral lesions. These manifestations may clinically and radiologically mimic bladder neoplasms, urinary tract infections, tuberculosis, or other inflammatory bladder diseases, posing a significant diagnostic challenge for clinicians and radiologists alike. Hematuria, irritative lower urinary tract symptoms, and bladder wall thickening are among the most frequent findings, but the presentation may vary considerably depending on the stage and severity of the disease.

In Morocco, schistosomiasis has become uncommon following successful national eradication efforts; however, isolated cases are still encountered in southern regions where environmental and

socioeconomic factors may facilitate residual transmission. Reporting such cases remains important to raise awareness among healthcare professionals, especially in low-endemic settings where familiarity with the disease has diminished. Early recognition is essential to avoid unnecessary invasive procedures and to initiate appropriate antiparasitic treatment.

We report a rare case of vesical schistosomiasis from southern Morocco presenting with clinical and radiological features suggestive of bladder disease. This case highlights the diagnostic pitfalls of this neglected parasitic infection and emphasizes the importance of considering schistosomiasis in the differential diagnosis of bladder lesions, even in regions with declining endemicity.

CASE REPORT

A 65-year-old male from southern Morocco presented with a 3-month history of intermittent terminal hematuria. He was diagnosed and managed at the Department of Urology, Military Hospital of Agadir. He reported repeated exposure to stagnant freshwater, as he used to swim in such water in the Tata region (South Morocco). He denied fever, dysuria, flank pain, weight loss, or other systemic symptoms. His past medical history was unremarkable.

Physical examination was normal.

Cystoscopy revealed an erythematous bladder mucosa with refringent "pinhead-sized" granulations and whitish nodular plaques characteristic of bilharzial granulomas (Figure 1).

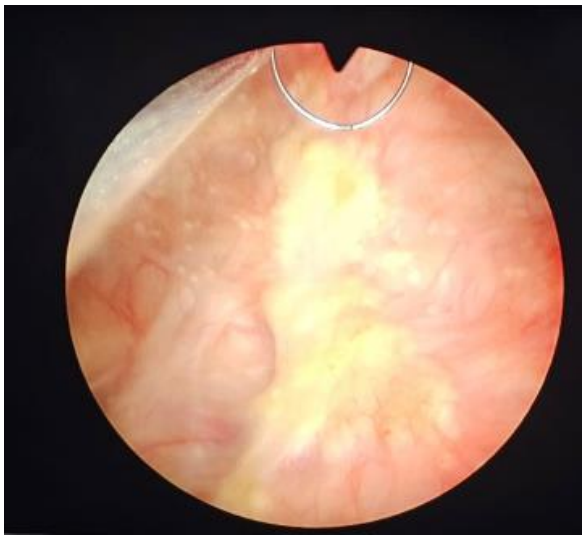

Figure 1: Cystoscopic view showing an erythematous bladder mucosa with fine refringent granulations ("sandy patches") and nodular plaques characteristic of bilharzial granulomas

Bladder biopsies were performed. Histopathological examination showed a granulomatous inflammatory reaction composed of epithelioid and multinucleated giant-cell granulomas, with abundant eosinophils. Bilharzial eggs were identified in the center of these granulomas (Figure 2). The diagnosis was confirmed by parasitological evidence, with Schistosoma haematobium eggs detected on direct microscopic examination of freshly collected urine.

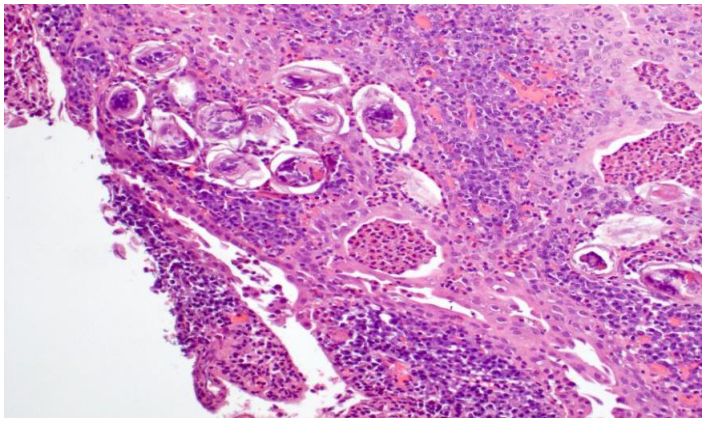

Figure 2: Bladder biopsy showing eosinophil-rich granulomatous inflammation with epithelioid and multinucleated giant-cell granulomas containing Schistosoma haematobium eggs in the center (hematoxylin and eosin stain)

The patient was treated with praziquantel at the recommended regimen for urogenital schistosomiasis: 40 mg/kg total dose. Clinical follow-up showed marked improvement with resolution of hematuria. A control cystoscopy performed 6 weeks after treatment demonstrated clear regression of the erythematous changes and near-complete disappearance of the refringent granulations, consistent with a favorable response.

DISCUSSION

Urogenital schistosomiasis (UGS) due to Schistosoma haematobium remains a clinically important cause of haematuria and chronic lower urinary tract disease, particularly in populations with freshwater exposure in endemic or previously endemic foci. Even where national control programmes have markedly reduced transmission, the World Health Organization (WHO) emphasizes that schistosomiasis is sustained by ecological and behavioural determinants (water contact, sanitation, intermediate snail hosts) and that surveillance remains necessary in the control-to-elimination continuum [6]. In this context, our case illustrates that vesical schistosomiasis can still present with typical symptoms and characteristic endoscopic and histological features, despite the perception of "post-elimination" status in some settings.

The patient presented with intermittent terminal haematuria over three months, a classical manifestation of UGS. Clinically, haematuria reflects egg deposition in the bladder wall and the ensuing inflammatory response, which may fluctuate according to intensity of infection, degree of mucosal injury, and co-existing inflammation. While haematuria is often considered a screening sign in endemic areas, it is particularly challenging in older adults because haematuria is also a cardinal warning symptom for bladder malignancy. The diagnostic pathway in older patients is therefore appropriately anchored in exclusion of urothelial carcinoma. However, in individuals with credible freshwater exposure, UGS must remain in the differential diagnosis, both to avoid diagnostic delay and because schistosomiasis-related lesions can mimic malignancy endoscopically and macroscopically [11].

The epidemiological element is central to this case. The patient reported swimming in stagnant freshwater in Tata (southern Morocco). Notably, Tata has historical relevance in Moroccan schistosomiasis epidemiology and has been included in elimination-era monitoring work. In a comprehensive review of Moroccan urinary schistosomiasis control (1960–2018), major progress was documented, but residual detections and the need for continued vigilance were also highlighted [7]. Moreover, post-elimination surveillance approaches have been assessed to improve detection of low-grade infection and to prevent re-emergence, reflecting the ongoing programmatic importance of sensitive monitoring tools in Morocco [8]. From a clinical standpoint, these data support continued "exposure-based reasoning": if a patient has compatible symptoms and a plausible exposure in a historically endemic focus, schistosomiasis should still be considered even when national indicators suggest elimination [7,8].

Cystoscopic findings in UGS are polymorphic and can overlap with chronic cystitis or neoplastic lesions. "Sandy patches" and mucosal granularity are classically described and correspond to mucosal areas containing eggs (sometimes calcified) and chronic inflammatory change; they may appear as granular or refringent lesions on erythematous mucosa. The cystoscopic appearance in our patient—erythematous bladder mucosa with refringent "pinhead-sized" granulations and whitish nodular plaques—fits within this descriptive spectrum. Such lesions are not sufficiently specific to establish diagnosis without tissue confirmation, particularly in an older male where malignancy is a competing priority. Hence, bladder biopsy plays a decisive role whenever cystoscopy demonstrates suspicious mucosal abnormalities [11].

Histopathology in this case demonstrated epithelioid and multinucleated giant-cell granulomas rich in eosinophils, with bilharzial eggs within granuloma centres. This pattern is typical for tissue schistosomiasis, reflecting the host's granulomatous response to egg antigens. The diagnostic strength is further increased because egg detection was also achieved by direct microscopic examination of freshly collected urine, confirming active urogenital involvement. While urine microscopy remains a cornerstone diagnostic method, its sensitivity varies—especially in low-intensity infections, chronic disease, or in post-control contexts where egg excretion can be intermittent or minimal. A recent systematic review and meta-analysis of diagnostic tests highlight the limitations of conventional approaches in low-endemicity settings and the need for improved tools for surveillance and verification of transmission interruption [9]. The dual confirmation used here (histology plus urine microscopy) therefore represents a robust diagnostic approach aligned with international expectations for case reporting.

Therapeutically, praziquantel is the recommended first-line treatment for UGS. CDC clinical guidance specifies praziquantel 40 mg/kg total dose administered orally in two divided doses over one day for S. haematobium infection, and notes that follow-up parasitological assessment 1–2 months after therapy can help document cure when eggs were detected before treatment [10]. In our case, the patient received praziquantel at this recommended regimen and showed symptomatic improvement, with a control cystoscopy at six weeks demonstrating clear regression of erythematous inflammatory changes and near-complete

disappearance of the refringent granulations. This short-interval endoscopic follow-up adds objective value: symptom resolution alone may occur even when mucosal inflammation persists, whereas cystoscopic regression provides stronger evidence of clinical response and supports the interpretation that lesions were related to active schistosomal inflammation rather than an alternative chronic pathology [11].

A critical consideration in the discussion of UGS—particularly in a 65-year-old male presenting with haematuria—is the established association between chronic S. haematobium infection and bladder cancer. The International Agency for Research on Cancer (IARC) has classified infection with S. haematobium as carcinogenic to humans, with strong evidence linking it to squamous cell carcinoma of the urinary bladder [12]. Contemporary reviews summarize proposed carcinogenic pathways including chronic inflammation, epithelial hyperplasia/metaplasia, genotoxic exposures (e.g., nitrosamines in the context of bacterial co-infection), and parasite/host interactions that may promote malignant transformation [13,14]. While a single treated episode does not imply imminent malignancy, the age of the patient and the haematuria presentation justify careful initial exclusion of cancer (as performed by cystoscopy and biopsy), and they support a pragmatic follow-up strategy if haematuria recurs or if new suspicious lesions appear [12–14].

From a public health and clinical integration perspective, this case offers an additional message: elimination achievements should not translate into diagnostic complacency. Morocco's long-term control success is well documented, including interruption of transmission and strengthening of surveillance strategies [7]. Yet focal vulnerabilities can persist through ecological suitability for snails, population mobility, and re-introduction risks. Monitoring efforts using sensitive assays in elimination settings reflect this reality and reinforce the clinical lesson that individual exposure history remains relevant even when community transmission is thought to be interrupted [8,9]. Consequently, taking a focused exposure history (freshwater contact, travel, occupational/recreational water activities) remains pivotal when evaluating haematuria in endemic or previously endemic regions [6–9].

Strengths and limitations

Strengths. This report is supported by a highly suggestive exposure history (freshwater contact in a historically relevant focus), a classic symptom pattern (terminal haematuria), and strong diagnostic confirmation using two modalities: characteristic eosinophil-rich granulomatous inflammation with eggs on histopathology, and direct urine microscopy demonstrating S. haematobium eggs. In addition, documenting cystoscopic evolution at six weeks after praziquantel provides objective evidence of response and strengthens the educational value of the case for clinicians who may encounter similar endoscopic appearances [10,11].

Limitations. First, no ultrasound or CT urography was performed, limiting assessment of upper urinary tract involvement or chronic complications (hydronephrosis, ureteric strictures, calcifications), which are well described in long-standing genitourinary schistosomiasis [11]. Second, egg quantification and standardized post-treatment parasitological confirmation (e.g., repeat filtration or repeated urine samples) were not available, restricting comparisons with standardized diagnostic endpoints and limiting inference about infection intensity [9]. Third, the follow-up window was relatively short (six weeks); longer clinical follow-up would be useful to document sustained remission and to maintain oncologic vigilance should haematuria recur, in line with recognized long-term complications of chronic infection [6,12–14].

CONCLUSION

Vesical schistosomiasis should remain a differential diagnosis of terminal haematuria in patients with freshwater exposure, even in regions where transmission has markedly declined. Cystoscopic appearances may be subtle and non-specific, and histopathology is essential to confirm the diagnosis and to exclude malignancy, particularly in older patients. Standard praziquantel therapy (40 mg/kg in two divided doses) can lead to rapid symptomatic improvement, and short-term cystoscopic follow-up may objectively document regression of mucosal lesions. Continued clinical awareness supports timely treatment and helps prevent complications.

Declarations

Ethics approval and consent to participate: Ethical approval was not required for this case report according to local institutional policy, as it reports anonymized clinical data without experimental intervention.

Consent for publication: Written informed consent was obtained from the patient for publication of this case report and the accompanying image(s).

Competing interests: The authors declare that they have no competing interests.

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