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Case Report

Spinal schistosomiasis masquerading as spinal cord tumor in a 12-year-old male adolescent: A case report ☆

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ABSTRACT

Spinal schistosomiasis, a rare manifestation of schistosomal infection, can closely mimic the presentation of spinal cord tumors and pose significant diagnostic challenges. We present the case of a 12-year-old boy from northern Ethiopia who experienced progressive back pain, tingling sensations in his lower extremities, and intermittent fever. Initially referred with a presumptive diagnosis of myxopapillary ependymoma for pediatric hematology-oncology evaluation, his marked eosinophilia and history of swimming in local rivers raised suspicion for spinal schistosomiasis. Upon review by a neuroradiologist, an MRI revealed a long-segment expansion of the spinal cord from T10 to L2, showing heterogenous enhancement on T1-weighted postcontrast images and hyperintense signals on T2-weighted images. Furthermore, the patient's Schistosoma mansoni IgG titer was elevated, strongly supporting the diagnosis. Treatment was initiated with praziquantel and corticosteroids, leading to a notable improvement in his symptoms. This case highlights the importance of considering parasitic infections like schistosomiasis in regions where they are endemic, particularly when spinal pathologies may resemble neoplastic conditions. Early diagnosis and intervention are crucial to preventing long-term neurological damage.

Introduction

Schistosomiasis is a parasitic disease caused by trematodes of the Schistosoma genus, with spinal involvement being a rare but significant manifestation. Schistosomiasis primarily affects regions where water contact is frequent, such as sub-Saharan Africa, and is transmitted through freshwater snails [1]. Spinal schistosomiasis occurs when schistosome eggs are deposited in the spinal cord, leading to granulomatous

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inflammation, which can cause myelopathy and other neurological deficits [2]. This condition is frequently associated with marked eosinophilia, which serves as an important diagnostic clue in endemic areas [3]. The common symptoms include back pain, sensory disturbances, and progressive weakness, often mimicking other spinal pathologies, such as tumors [4].

On the other hand, myxopapillary ependymoma (MPE) is a WHO Grade I neoplasm most commonly found in the conus medullaris or filum terminale. MPE often presents in young adults with symptoms like lower back pain, sciatica, and, in severe cases, neurological deficits due to compression of adjacent spinal structures [5]. MRI is essential for diagnosis, revealing a well-circumscribed lesion, typically showing enhancement on contrast administration [6]. MPE and spinal schistosomiasis can present similarly, with overlapping symptoms and imaging findings, which complicates differential diagnosis, especially in regions endemic to schistosomiasis [7].

In endemic regions, the combination of eosinophilia and neurological symptoms should prompt suspicion of spinal schistosomiasis, even if imaging suggests a neoplasm [3]. A history of freshwater exposure in areas known for schistosomiasis transmission, along with eosinophilia, should alert clinicians to consider parasitic infections alongside neoplastic processes like MPE [2,5].

This case discusses the importance of considering a broad differential diagnosis, particularly in areas endemic to parasitic infections, where diseases like schistosomiasis may masquerade as neoplastic conditions.

Case presentation

A 12-year-old boy from northern Ethiopia, previously healthy, presented with a 1-month history of progressive back pain. The pain was dull, intermittent, and worsened with physical activity. Initially, the pain was localized but later radiated to the lower extremities and was relieved by rest. There were no antecedent triggers like trauma or heavy lifting. Approximately 1 week after the onset of back pain, he developed tingling sensations in his lower extremities and buttocks. He denied weakness, bowel or bladder changes, and gait abnormalities. These symptoms were complicated by intermittent low-grade fever, loss of appetite, and unquantified weight loss. He had no known history of contact with tuberculosis (TB) patients, nor had he undergone any prior treatment for TB.

The patient sought care at a local health center and was treated with paracetamol and an unspecified intramuscular injection, without symptom relief. The increasing severity of his pain led to his referral to a hospital where a spinal MRI suggested myxopapillary ependymoma with mild proximal syringomyelia. He was subsequently referred to a tertiary center for pediatric hematology-oncology evaluation.

Despite this initial diagnosis, his medical and social history pointed to other possibilities. Notably, the patient often swam in local rivers, though he could not recall any postexposure itching or fever. There was also no history of abdominal swelling or jaundice, and the patient denied consuming raw or undercooked meats. His developmental milestones were normal, and his academic performance was above average.

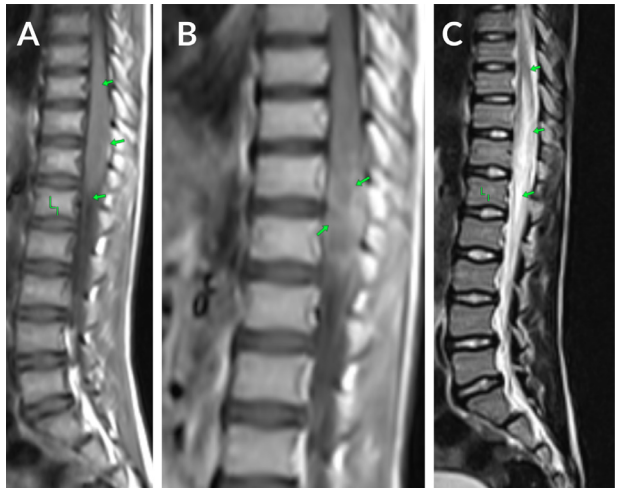

Fig. 1 – T1W (A), T1W postcontrast (B), and T2W (C) sagittal thoracolumbosacral MRI images show a long-segment spinal cord expansion from T10 to T12, appearing hypointense on T1W, hyperintense on T2W, and showing heterogeneous enhancement on T1W postcontrast.

On physical examination, he appeared well, with stable vital signs. There was tenderness over the lumbar spine, but neurological examination was otherwise normal. Motor strength was 5/5, deep tendon reflexes were 2/4, and no muscle atrophy or fasciculations were noted. Sensation was intact, and there were no signs of gait disturbance or meningeal irritation. His respiratory, cardiovascular, and gastrointestinal systems were unremarkable.

Initial laboratory findings revealed marked eosinophilia (22.6%), raising the suspicion of a parasitic infection. Other components of the complete blood count were within normal limits. A stool examination was negative for ova or parasites, and an abdominal ultrasound was normal. Urinalysis showed no signs of infection. Cerebrospinal fluid (CSF) analysis was not done.

The spinal MRI revealed a long-segment expansion of the spinal cord from T10 to T12, characterized by T1-weighted (T1W) hypointensity and a hyperintense signal on T2-weighted (T2W) imaging, with heterogeneous enhancement observed on the postcontrast study (Figs. 1 and 2). These findings, combined with the patient's clinical history of freshwater exposure and eosinophilia, prompted consideration of spinal schistosomiasis as a differential diagnosis. Subsequently, a serum Schistosoma mansoni IgG titer was done, revealing elevated levels (>53.9 units).

The patient was started on praziquantel to reduce the parasitic load. Corticosteroids were administered to control the inflammatory response and prevent further neurological damage. The patient's progress was monitored closely with serial clinical examinations and repeat imaging. During follow-up visits, the patient showed significant improvement, and a follow-up MRI revealed normal findings.

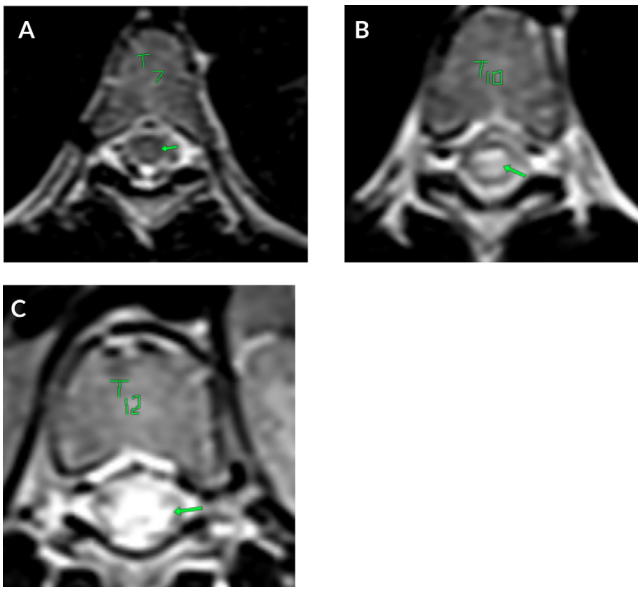

Fig. 2 – T2W axial thoracolumbosacral MRI at the level of T7, T10 and T12 respectively shows the normal spinal cord size and signal intensity at T7 level (A), expansion of the spinal cord with T2W hyperintense central signal at T10 and T12 level (B and C).

Discussion

The incidence of spinal schistosomiasis is rare and varies across regions. Globally, neuroschistosomiasis, which includes spinal involvement, affects approximately 1%-4% of the 200-300 million individuals with schistosomal infections. In Pernambuco, Brazil, a 15-year retrospective study reviewed medical records and identified 139 cases of spinal neuroschistosomiasis in patients aged 2-83 years. The study revealed that spinal cord lesions were most frequently located in the low thoracic region (40.3%), followed by the lumbar region (15.8%), with only 0.7% involving the lumbosacral region, highlighting a notable regional burden [2,8].

Our case illustrates the challenges in differentiating parasitic infections from neoplastic conditions, particularly in endemic regions. Neuroschistosomiasis can manifest years after initial infection due to the delayed immune response to eggs deposited in the spinal cord [9,10].

The patient's clinical presentation of progressive lower back pain, tingling sensations in the lower extremities, and intermittent fever is typical of spinal schistosomiasis. The literature reports similar symptoms in spinal involvement, with common manifestations including back pain, lower limb weakness, and sensory disturbances, particularly when the spinal cord or conus medullaris is involved [11]. The absence of bowel or bladder dysfunction in this patient is notable, though not uncommon in early stages of spinal schistosomiasis [12].

In our case, the elevated serum Schistosoma mansoni IgG (>53.9 units) and marked eosinophilia provided crucial diagnostic clues, emphasizing the importance of serologic testing in areas where schistosomiasis is endemic. Spinal MRI findings were central to the diagnosis as well. The MRI demonstrated long-segment spinal cord expansion from T10-L2, with T2W hyperintense signals and T1W contrast enhancement—hallmarks of granulomatous inflammation from schistosomal eggs [13,14].

Our case shares several similarities with the one reported by Mohamed et al. [15], which also describes spinal schistosomiasis presenting with progressive neurological deficits and imaging findings mimicking neoplastic conditions. Both cases involved children in endemic regions, with delayed presentation leading to diagnostic challenges. However, in contrast to our case, Mohamed et al. reported a child who exhibited more advanced neurological deficits, including paraplegia, incontinence, and severe hypotonia. Their patient underwent laminectomy, with histopathology confirming schistosomiasis, while our case was diagnosed based on serological evidence and imaging findings without invasive procedures.

The standard treatment for spinal schistosomiasis involves praziquantel to reduce the parasitic burden, combined with corticosteroids to control the immune-mediated inflammatory response. Studies confirm that early use of corticosteroids helps prevent further neurological damage and enhances recovery, as seen in this case. Early diagnosis and treatment are critical to prevent permanent neurological deficits, and regular follow-up with clinical and imaging assessments is essential to monitor the response to therapy [16].[1]

In summary, the combination of eosinophilia, history of freshwater exposure, elevated Schistosoma mansoni IgG titer and MRI findings characteristic of spinal schistosomiasis allowed for an accurate diagnosis and successful treatment in this patient, preventing further neurological complications. This case reinforces the need for heightened clinical suspicion of spinal schistosomiasis in endemic areas to ensure timely and effective intervention.

Conclusion

Spinal schistosomiasis, though rare, can have serious neurological consequences if not promptly diagnosed and treated. The presence of eosinophilia, combined with a relevant exposure history, can be crucial clues in arriving at the correct diagnosis. Early diagnosis and treatment are essential to prevent permanent neurological damage in patients with neuroschistosomiasis.

Patient consent

Written informed consent was obtained from the patient's guardian for publication of this case report and accompanying images, and can be provided if requested by the editor-in-chief.

[1] Our patient improved significantly after being given praziquantel and corticosteroid.

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