

Cerebral neuroschistosomiasis presenting as a brain mass. A case report.

ahmad matarneh¹, mohanad faisal², salma mustafa², Abdullah Mohammad Arshad³, and Nedia Neffati³

¹Hamad medical corporation

²Hamad medical corpotation

³Hamad Medical Corporation

June 30, 2022

Abstract

Neuroschistosomiasis is a rare entity, it can cause cerebral or spinal cord involvement. high clinical suspicion is needed to diagnose it and rapid treatment is needed to prevent complications.

Cerebral neuroschistosomiasis presenting as a brain mass. A case report.

Ahmad S. Matarneh 1, Mohanad M. Faisal 1, Salma F. Mustafa 1, Abdulla M. Arshad 1, Nedia Neffati 2.

Internal medicine resident, Hamad medical corporation, Doha, Qatar

Consultant, Internal Medicine, Hamad Medical Corporation, Doha, Qatar

*Corresponding Author

Dr. Salma Faisal Eltayeb Mustafa

Department Internal Medicine.

Hamad Medical Corporation.

Al Rayyan street.

Doha, Qatar.

Tel: +97466098858

Fax: -44397857

E-mail: Smustafa8@hamad.qa

Running title:

A brain mass caused by neuroschistosoma.

Abstract Neuroschistosomiasis is an extremely rare manifestation of schistosomal infections. It can either present with Cerebral or with spinal cord involvement.

We present a 31-year-old fillipino lady, presented with two-weeks history of headache, dizziness and nausea. An urgent MRI of the head with contrast showed features suggestive of brain lesion with edema. On further history taking she had a history of working in a farm. Serology for Schistosoma was sent and came positive

with titre 1:160. She was treated as neuroschistosomiasis with intravenous steroids followed by praziquantel for 10 days along with steroids after which he showed significant improvement in her headache and significant regression in the brain lesion on MRI.

Cerebral neuroschistosomiasis is a rare complication of schistosoma infection it should be kept in mind when dealing with an unexplained brain lesion. If not treated promptly, it can result in severe irreversible complications.

Introduction :

Schistosomiasis is a helminthic disease which is more commonly seen in the Middle East (1). Infection usually occurs after contact with snails that contains the eggs and parasite which are the intermediate host. Snails then release cercariae, the infectious form of the parasite into the water, cercariae can penetrate the skin of the host and thus causing the infection (2). Neuroschistosomiasis is rare. It can either involve the brain or it can involve the spinal cord (3). In this case, we present a rare case in which the patient presented with headache and was found to have brain lesion secondary to neuroschistosomiasis, the patient showed significant improvement after treatment with praziquantel and steroids.

Case presentation:

A 31-year-old Filipino lady, previously well presented to the hospital with weeks history of headache, dizziness, and nausea with vomiting. She had no chronic medical condition or previous similar episodes. On examination, vital signs showed normal temperature with normal BP 115/71 and HR of 87. Neurological examination revealed well oriented lady, normal fundoscopy, normal power, sensation, and deep tendon reflexes. Basic investigation revealed high inflammatory markers with pyuria and acute kidney injury as depicted in the below (table 1)

Plain CT head showed ill-defined right occipitoparietal hypodensity with mass effect and suspicious right occipital density (Figure 1). Intravenous Dexamethasone was started, and the patient was admitted under neurosurgery. brain MRI was obtained which revealed Right medial parieto-occipital essentially cortical irregular curvilinear/punctate enhancing lesion with the significant adjacent surrounding subcortical/white matter oedema (Figure 2). Lumbar puncture showed normal studies. Schistosoma antibodies were positive, and she was started on praziquantel along with dexamethasone. Subsequently, the patient improved clinically and was discharged home. On follow-up visits, she had improvement of her symptoms, and follow up MRI head showed significant regression in the brain lesion (figure 3).

Discussion:Schistosomiasis is a rare helminthic disease caused by Schistosoma flukes; however, it is regarded as the second most common tropical disease (5). It can affect multiple organs including the liver, intestines, urinary bladder, central nervous system. There are several known types of Schistosoma, S. Haematobium, S. Japonicum, S. Mansoni, and S. Mekongi (4). Neuroschistosomiasis is usually rare and multiple theories have been studied on its pathophysiology, but the most accepted is that it results from the embolization of the organism's eggs until it lands in the central nervous system. After reaching the central nervous system, Schistosoma eggs usually induce a local eosinophilic inflammation resulting from the release of proteolytic enzymes. The resultant inflammation causes damage with granuloma formation and eventually fibrosis and demyelination of the surrounding structures (7). Its manifestations are divided into cerebral Schistosoma, which occurs when S. Japonicum reaches the brain causing encephalitis, which presents with symptoms of headache, seizures, altered mentation, or the spinal schistosomiasis resulting from S. Mansoni (and less commonly S. Haematobium) where it can cause myelitis with symptoms of weakness, back pain, and urine retention (6)

Diagnosing neuroschistosomiasis can be challenging as it requires a high index of clinical suspicion. MRI is the gold standard diagnostic study to diagnose CNS involvement and it can detect changes consistent with cerebritis, cerebral mass (8, 9). Definite diagnosis is usually invasive as it requires tissue biopsy. Serology is a sensitive test for the diagnosis, but with low specificity as the false positivity is common, however when the titers are positive in high titers (>1:160) they are considered significant (10, 11).

After establishing the diagnosis, prompt treatment should be started as it has been shown to improve the outcome. Steroids need to be started before praziquantel to decrease the inflammation that might result from the cytotoxic effect of praziquantel on the organism (12). Praziquantel's mechanism of action is that it causes tetanic contractions paralyzing the organism (13). It acts only on the mature adult worms and not the larval form making it ineffective in the early stages of infection (14).

Learning Points:

Cerebral neuroschistosomiasis is one of the very rare presentations of *Schistosoma* infection that can present with unexplained brain lesions. It can result in severe irreversible complications. Early diagnosis and treatment are needed to prevent further deterioration.

Treatment with steroids and praziquantel is usually the mainstay therapy

Ethical Approval:

Ethical approval for publication of this case series has been granted by Medical Research Committee of Hamad Medical Corporation

Consent form:

Written informed consent was obtained from patient to publish this report in accordance with the journal's patient consent policy.

Conflict of interest:

None of the authors involved in this case report have any conflict of interest

References:1. Clerinx J, Van Gompel A. Schistosomiasis in travellers and migrants. *Travel Medicine and Infectious Disease*. 2011 Jan 1;9(1):6-24. 2. Colley DG, Bustinduy AL, Secor WE, King CH. Human schistosomiasis. *The Lancet*. 2014 Jun 28;383(9936):2253-64. 3. Ferrari TC. Involvement of central nervous system in the schistosomiasis. *Memorias do Instituto Oswaldo Cruz*. 2004 Aug;99:59-62.

4. Nelwan ML. Schistosomiasis: life cycle, diagnosis, and control. *Current Therapeutic Research*. 2019 Jan 1;91:5-9. 5. Li Y, Ross AG, Hou X, Lou Z, McManus DP. Oriental schistosomiasis with neurological complications: case report. *Annals of clinical microbiology and antimicrobials*. 2011 Jan 1;10(1):5.

6. Elsbernd P, Lago K, Calvano T, Sladky J. Complete Neurologic Recovery after Acute Cauda Equina Syndrome due to Neuroschistosomiasis (P5. 089).

7. Al-Abdulwahhab AH, Al-Sharydah AM, Al-Suhibani SS, Al-Jubran SA, Al-Haidey AK, Al-Hifzi AI, Al-Issawi W. Neuroschistosomiasis mimicking lower back pain: case report of a rare differential diagnosis in a pediatric patient. *Patient safety in surgery*. 2018 Dec;12(1):1-4. 8. Ferrari TC, Moreira PR. Neuroschistosomiasis: clinical symptoms and pathogenesis. *The Lancet Neurology*. 2011 Sep 1;10(9):853-64.

9. Llenas-García J, Guerra-Vales JM, Alcalá-Galiano A, Domínguez C, Pérez-Nuñez A, Lizasoain M, Díaz-Pedroche C, Montes S, Martínez J, Sierra F, Salto E. Cerebral neuroschistosomiasis: a rare clinical presentation and review of the literature. *Case Reports*. 2009 Jan 1;2009:bcr0420091787. 10. Al-Abdulwahhab AH, Al-Sharydah AM, Al-Suhibani SS, Al-Jubran SA, Al-Haidey AK, Al-Hifzi AI, Al-Issawi W. Neuroschistosomiasis mimicking lower back pain: case report of a rare differential diagnosis in a pediatric patient. *Patient safety in surgery*. 2018 Dec;12(1):1-4. 11. Kinkel HF, Dittrich S, Bäumer B, Weitzel T. Evaluation of eight serological tests for diagnosis of imported schistosomiasis. *Clinical and Vaccine Immunology*. 2012 Jun 1;19(6):948-53.

12. Gray DJ, Ross AG, Li YS, McManus DP. Diagnosis and management of schistosomiasis. *Bmj*. 2011 May 17;342:d2651.

13. Vale N, Gouveia MJ, Rinaldi G, Brindley PJ, Gärtner F, da Costa JM. Praziquantel for schistosomiasis: single-drug metabolism revisited, mode of action, and resistance. *Antimicrobial agents and chemotherapy*.

2017 May 1;61(5). 14. Xiao SH, Sun J, Chen MG. Pharmacological and immunological effects of praziquantel against *Schistosoma japonicum*: a scoping review of experimental studies. *Infectious diseases of poverty*. 2018 Dec 1;7(1):9.

15. Sayed AA, Simeonov A, Thomas CJ, Inglese J, Austin CP, Williams DL. Identification of oxadiazoles as new drug leads for the control of schistosomiasis. *Nature medicine*. 2008 Apr;14(4):407-12.

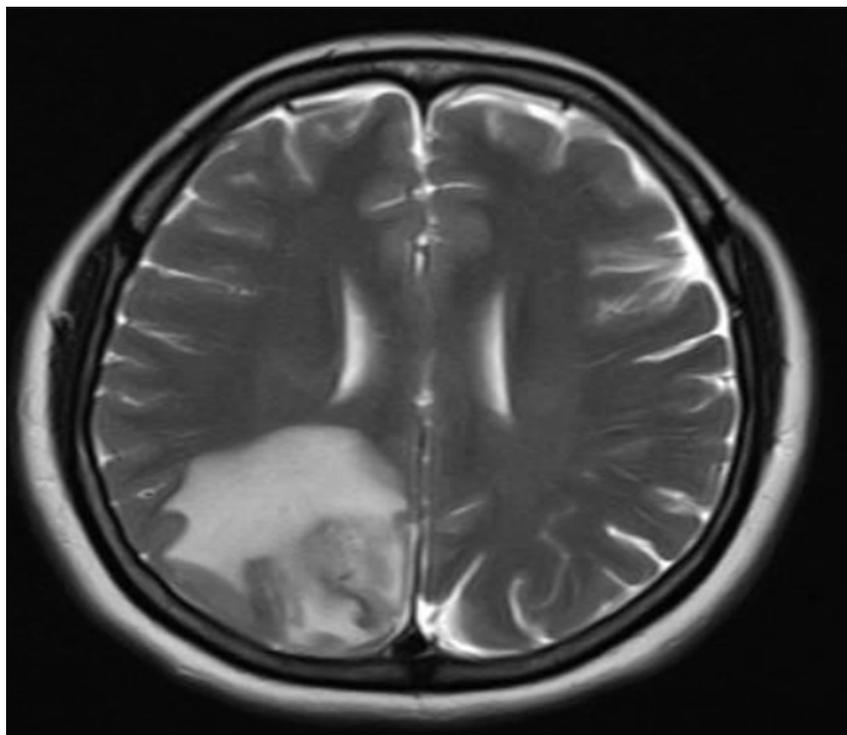


Figure 2. Right medial parieto-occipital essentially cortical irregular curvilinear/punctate enhancing lesion with the significant adjacent surrounding subcortical/white matter oedema.

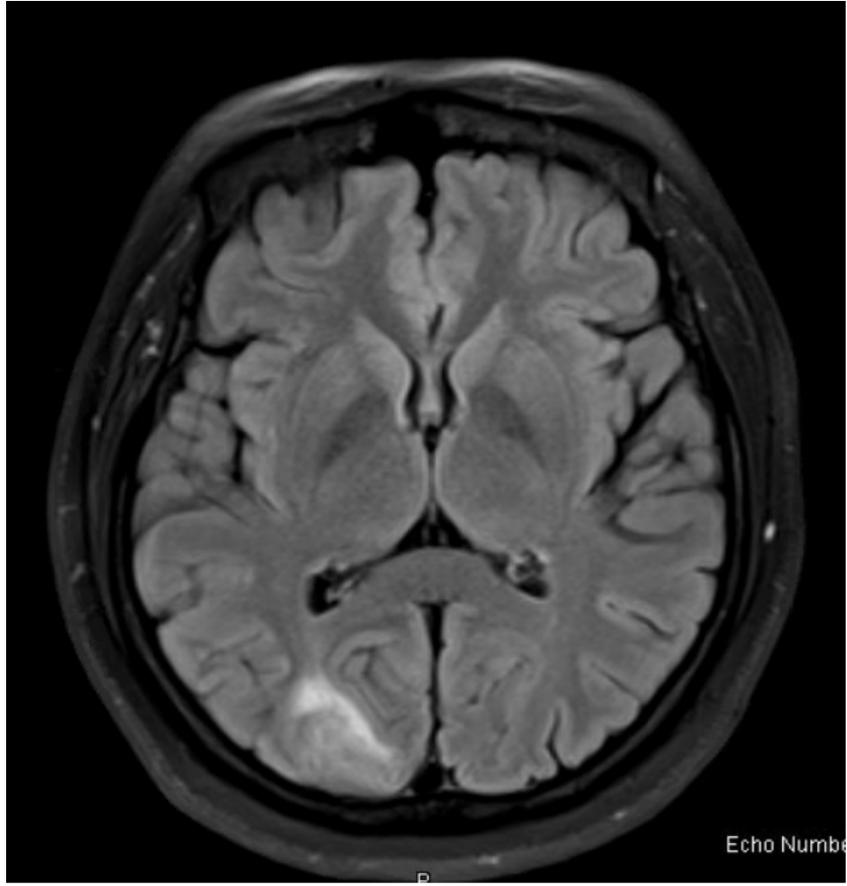


Figure 3. Significant regression of the right parieto-occipital lesion and the associated oedema

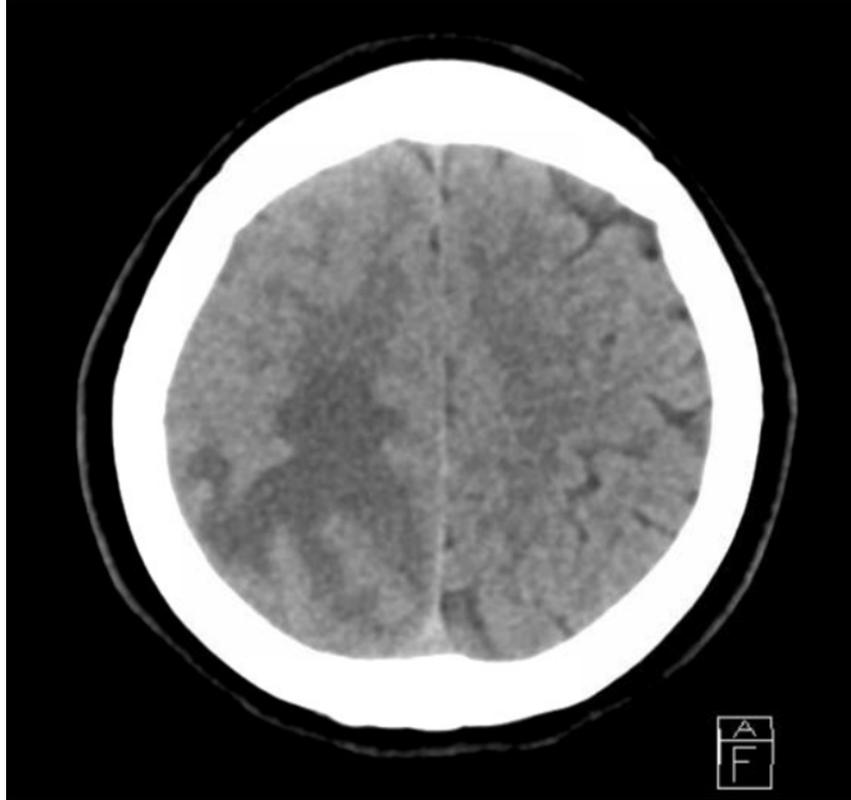


Figure 1. Ill-defined right occipitoparietal hypodensity with mass effect and suspicious right occipital density