

Subdural hematoma in a patient with cerebral malaria - Diagnostic dilemma in the emergency department of a resource-limited setting

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ABSTRACT

Background: Malaria is still endemic in most African countries, making it a significant threat to global public health. Here, we describe a patient with malaria having a massive subdural hematoma.

Case: The case reports a 17-year-old male who presented with severe malaria after he presented with a two-week history of headache, generalized body malaise, high-grade fever, followed by one day of generalized tonic-clonic seizure and loss of consciousness. After the patient recovered, he reported that he had trauma 2 weeks prior to the above symptoms. Urgent CT of the brain showed a massive subdural hematoma, which requires referral to a referral hospital where an operation was performed. After 3 weeks, the patient is fully awake and at his baseline neurological function.

Conclusion: This case demonstrated the diagnostic challenge in the emergency room, since the reduced level of mentation and convulsion may be explained solely by cerebral malaria, but deciding and doing a brain CT revealed a subdural hematoma that improved with surgery. What if the subdural was overlooked in a resource-limited context, without imaging, and without a decision to image? Malaria would be the cause of death, correct?

Keywords: Malaria, Subdural hematoma, Emergency Department

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1. Introduction

Malaria is a fatal illness spread by mosquitoes that kills over 500,000 people worldwide each year. It is a chronic and serious public health concern because of its disproportionate effect on vulnerable groups.^(1,2)

Cerebral malaria is a life-threatening consequence of *Plasmodium falciparum* infection. Patients manifest with the classic triad of high fever, convulsions, and coma because of parasites sequestering in brain capillaries. It is a medical emergency with a high fatality rate and long-term brain impairments in survivors.

A subdural hematoma is a serious condition in which blood accumulates between the dura mater and the arachnoid membrane, believed to result from slow venous bleeding, typically from bridging veins on the cerebral surface, leading to an altered level of consciousness and convulsions.⁽³⁾

We present a rare presentation of a patient with severe malaria found to have a massive subdural hematoma because of the rare presentation of malaria with SDH, and the diagnosis of SDH in patients with malaria is often missed.

2. Case report

We present a case of a 17-year-old male who was admitted to our facility with a history of convulsions, which were generalized tonic clonic, which occurred 2 times, lasting less than 5 min during the day of presentation. For the past week before admission, he had a headache, generalized body malaise, high-grade fever, and vomiting of ingested matter. He has no trauma history.

This was the patient's first admission. There are no known chronic illnesses, and there is no personal or family history of coagulopathies. The patient has no history of smoking or alcohol consumption.

Upon arrival to ED, his Vital signs were Blood pressure (BP) of 158/83, Pulse Rate of 88, Respiratory rate of 20, and oxygen saturation of 97%. The general physical exam was unremarkable. The neurological examination revealed a Glasgow Coma Scale score of 13/15 (Eye – 3, Motor – 6, Verbal – 4). There was neck stiffness, but no other signs of meningeal irritation or neurological deficits were observed. Laboratory findings were wbc-13.14(4-10), hemoglobin 14.5(12-18), platelet 352k (150k-450k), Sodium 135(135-145), Potassium 3.9(3.5-5), chloride 97.7 (98-107), Urea 2.8(), creatinine 48 (44-115). SGOT10.9 (5-34), SGPT 9.1(0-55). Malaria thick smear showed +++ trophozoite. The positive malaria smear test almost led the team to 'premature closure' of the diagnostic process. During the round, it was decided to do a brain CT scan. A CT scan of the head revealed a right subdural hematoma with mass effect as figure 1. Upon arrival to the Emergency Department, the patient was initiated on intravenous artesunate (2.4 mg/kg), ceftriaxone (1 gm IV), a loading dose of phenytoin (20 mg/kg), and paracetamol (1 gm IV), in addition to comprehensive supportive care.

He was transferred to a referral hospital for neurosurgical care, where a bur hole was done, and the hematoma was drained. When the patient awoke, he stated that he had fallen one week prior to the current presentation. He returned home after a three-day hospital stay.

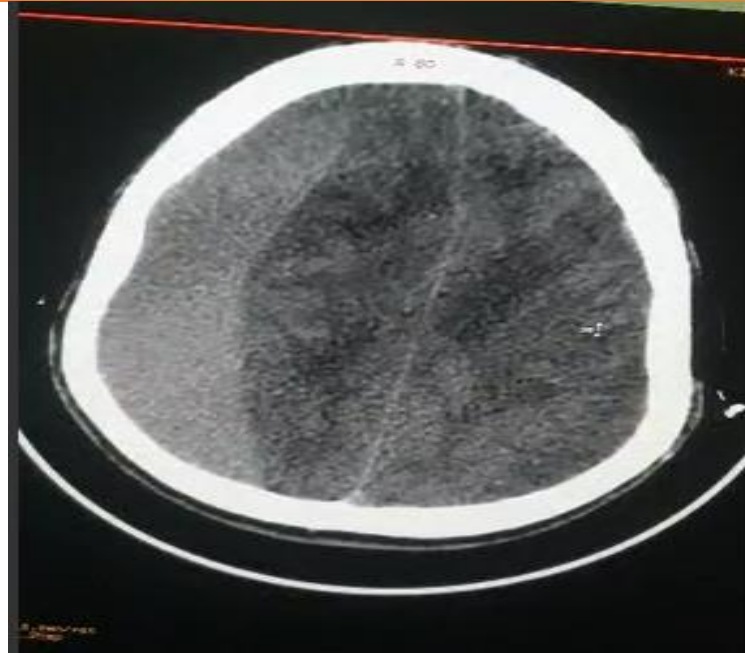


Figure 1: Right side acute massive subdural hematoma with midline shift

3. Discussion

Cerebral malaria, a severe complication, involves CNS manifestations such as convulsions, hemiplegia, delirium, coma, and often death. [4] Subdural hematomas mostly happen post-trauma because of torn veins. Some of the causes of SDH were head trauma, antithrombotic medication use, and high altitude. (5-8)

There were reports of patients having spontaneous subdural hematoma after having malaria. (8-12)

This scenario demonstrates a key diagnostic challenge in resource-constrained contexts. In a resource-limited setting, the patient's presentation is typically considered to be due to malaria or meningitis because of epidemiologic factors and the lack of imaging. The clinical presentation looks like cerebral malaria initially, but a CT scan revealed a subdural hematoma, necessitating immediate neurosurgery. Without early imaging and making decisions to image, the patient could have lost his life, and fatality would have been misclassified as malaria, which

underlines the critical need for diagnostic skills and decision-making in the emergency department.

The patient could have minimal SDH after the trauma, which was neglected because he did not go to a health facility, which could have been worsened by malaria, causing systemic inflammation. Even though the platelet count is normal, it could be dysfunctional and could have worsened the bleed.

This case highlights the vital importance of neuroimaging in patients presenting with an unexplained altered mental state, even if a solid primary diagnosis, such as cerebral malaria, is suspected. It emphasizes the critical need to maintain a broad differential diagnosis and remain vigilant in high-volume emergency situations to avoid missing life-threatening conditions. (13-15) Clinicians must actively screen for simultaneous, life-threatening illnesses such as traumatic cerebral hemorrhage rather than relying too much on a single, first reasonable explanation.

4. Conclusion

This case highlights the importance of thorough assessment, critical decision-making, and

diagnostic imaging to identify life-threatening illnesses in emergency departments in limited-resource settings.

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Competing interests

The authors declare no conflicts of interest.

Author contribution

All authors are involved in conceptualization, data curation, initial write up, final editing and review.

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