



Case Report

Cerebral Hematoma Following Scorpion Envenomation: A Case Report

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Abstract: *Introduction:* Scorpion stings are relatively common phenomenon encountered in many countries. Neurological complications post scorpion envenomation (SE) are rare and indicate a severe envenomation. We report the case of an 81-year-old, female, left-handed stung by a scorpion. *Case presentation:* She presented with severe headaches, vomiting, left hemiparesis following a scorpion sting. Neurological examination found altered consciousness with a Glasgow Coma Scale score of 9/15, motor aphasia, neck stiffness, facial asymmetry, left hemiparesis with absent tendinous reflexes on the left side, and a scar of the scorpion sting on the right thumb. Brain CT-scan showed spontaneous thalamo-caudate hyperdensity extending to the ventricles. The disease course was marked by clinical deterioration, leading to her death on the third day of hospitalization. *Discussion:* Cerebral hematomas are severe complications rarely described following scorpion envenomation.

Keywords: Envenomation, Scorpion Sting, Cerebral Hemorrhage, Gabriel Touré Hospital, Mali

1. Introduction

Scorpion envenomation (SE) is a relatively common incident in tropical and subtropical regions across the world. The morbidity and mortality related to SE makes it a significant public health concerns in many North African countries, India, Mexico, and the Middle East. [1] According to the WHO, snakebites, scorpion and spider stings causes serious injuries and mortality in most part of the world, particularly in tropical regions. However, the global epidemiology is not entirely known due to the gap in knowledge across developing countries with lack of reliable statistics. [2] In Mali, several species of scorpion have been identified which could potentially be a threat for human health.

[3] Overall, the severity of scorpion envenomation is classified into three groups. Class I: Simple sting without envenomation, characterized by one or more local signs (pain, redness, swelling, numbness) without any general symptoms. The pain is localized, very intense, and can last up to 24 hours. Class II: Envenomation with venom present in the bloodstream, manifesting as general symptoms (hyperthermia or hypothermia, chills, nausea, abdominal pain, abdominal bloating, diarrhea, urinary retention, etc.). Predictive signs of severity (priapism, vomiting, excessive sweating, fever > 39°C) indicate an imminent progression to stage III. The increase in systemic blood pressure is common but transient, quickly giving way to hypotension and shock. Stage III: Characterized by signs of vital distress, with cardiovascular

failure frequently being the cause of death. [4]

Although, neurological manifestations are uncommon in SE, they contribute to the severity of systemic manifestations of scorpion envenomation. The most common neurological manifestations reported include restlessness, altered consciousness, and seizures. Only a limited cases involving cerebral lesions have been reported in the literature. [5]

Here, we report the case of a patient who developed a cerebral hemorrhage after scorpion envenomation, seen in the neurology department at the teaching hospital of Gabriel Touré in Bamako, Mali.

2. Case Presentation

A 81 years old, female, with a medical history of chronic hypertension for the past 10 years, irregularly taking Amlodipine, was hospitalized for sudden altered consciousness. Parents reported that she was stung by a scorpion (specie not unidentified) on the thumb of her right hand. The initial symptoms included local swelling, severe headaches, and two episodes of vomiting. Six hours later, she was found unresponsive and unable to move the left side of her body.

She was taken to the health center of the village, where she received unspecified treatment and stayed for two days. Three days after the sting, she was transferred to the Emergency Department (ED) at Gabriel Touré University Hospital.

At admission, Glasgow Coma Scale score was 9/15 (E3V1M5), heart rate of 88 beats/minute, breathing rate of 16 cycles/minute, Temperature of 37°C, blood pressure of 140/90 mmHg. Neurological examination showed a pyramidal syndrome with left-sided hemiplegia rated 0/5, central left facial paralysis, Babinski sign, and brisk osteotendinous reflexes on the left side. A meningeal syndrome characterized by neck stiffness, Kernig's and Brudzinski's signs was also present. A cerebral CT scan performed three days after the sting revealed a right thalamo-caudate hyperdensity with ventricular involvement (Figure 1). The electrocardiogram (ECG) was normal, and cardiac ultrasound showed left ventricular hypertrophy. Total cell count found hemoglobin level of 11.5 g/dL, platelet count of 323.000/mm³, activated partial thromboplastin time (APTT) of 33.8 seconds, prothrombin time (PT) of 85.6%, and normal blood electrolytes (Na⁺: 137.7 mmol/L, K⁺: 3.39 mmol/L, Cl⁻: 104.2 mmol/L). Liver enzymes were normal with ALAT at 18.82 UI/L and ASAT at 44.75 UI/L.

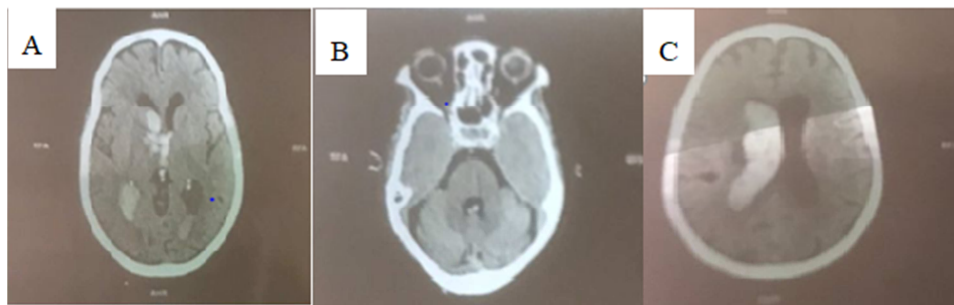


Figure 1. Brain CT scan images. A: Spontaneous hyperdensity thalamo-caudate and in third and right occipital horn ventricle. B: Hyperdensity in the fourth ventricle. C: Hyperdensity in the right lateral ventricle.

The initial treatment included vascular volume expansion with 0.9% saline solution, intravenous paracetamol (60 mg/kg/day), tetanus serum, and tetanus vaccine.

The patient's condition deteriorated, leading to her death three days after hospitalization, characterized by respiratory distress and neurological deterioration.

3. Discussion

Scorpion envenomation (SE) is a relatively common incident in tropical and subtropical regions across the five continents [6]. Its frequency, inherent morbidity and mortality make it a significant public health problem in many North African countries (the vast Sahara), India, Mexico, and the Middle East [1].

Scorpion venoms are rich in lethal toxins and can lead to multi-organ failure, threatening patient's life. Scorpion envenomation triggers a systemic inflammatory response and widespread tissue hypoperfusion, partly explaining the multi-organ failure, especially involving the heart, lungs, and the nervous system. The exact mechanism leading to

neurological dysfunction needs to be fully elucidated. However, it is suggested that this may result from the direct action of toxins, causing dysfunction of nerve cells through calcium accumulation by direct action on calcium channels. In addition, in children, where the blood-brain barrier is immature, scorpion toxins can cross it and directly affect damage the neurons. Moreover, high blood pressure due to disruptions in the central nervous system caused by the release of catecholamines can result in hypertension that may sometimes exceed the threshold of cerebral autoregulation, leading to hypertensive encephalopathy and brain lesions such as ischemia and edema. Cytokines and prostaglandin metabolites also contribute to the development of encephalopathy, leading to altered consciousness and confusion. These are induced by increased vascular resistance and reduced cerebral blood flow, already exacerbated by cardiovascular collapse and pulmonary edema [7, 8].

The neurological manifestations, caused by multiple neurotoxins, are diverse and complex, with a higher incidence reported in children [9]. Cases of ischemic stroke are documented in the literature, with only one fatal intracerebral

hemorrhage reported, making our case the second to date. In fact, Rai M et al. reported a case of cerebral hemorrhage in a 25-year-old patient, with clinical symptoms appearing 30 minutes after a scorpion sting and no other causes were found. [10] However, in our patient, the cerebral hematoma could be attributed to the rupture of microaneurysms (related to chronic hypertension), provoked by the neurotoxins.

Our patient received symptomatic treatment, including rehydration with saline 0.9%, analgesia with paracetamol, serum and tetanus vaccine, along with local wound care. She did not benefited antivenom immunotherapy, the key treatment in the management of systemic envenomation, which is not always available even in our reference health centers and hospitals in Mali [11].

4. Conclusion

Hemorrhagic stroke is a rare and serious complication of scorpion stings. Neurological dysfunctions may be caused by the direct action of scorpion toxins and other comorbidities like hypertension in this case. Its management requires a multidisciplinary approach involving emergency physicians, intensivists, and neurologists.

Conflicts of Interest

We declare no conflicts of interest.

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