

CASE REPORT

Clinical experience of late presentation and major limb complication of Snake bite: A case report and review

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Key Clinical Message

Snakebite is a significant global public health concern. Venomous snake bites can lead to various life-threatening clinical conditions that affect different bodily systems. These include the nervous system (neurotoxicity), musculoskeletal system (myotoxicity), cardiovascular system (cardiotoxicity), and blood clotting mechanisms (haemotoxicity). Here, we report a 5-year-old boy who was bitten by a snake and presented to the Emergency department with complaints of significant infection, necrosis, and gangrene affecting the three fingers of his right hand. After clinical evaluation and investigations, the patient underwent surgical intervention. The patient was discharged from the hospital after 5 weeks of admission with advice to follow up with a primary care physician and physical rehabilitation therapy to ensure the optimal healing and functionality of the affected hand.

KEYWORDS

anti-snake venom, envenomation, gangrene, Snake bite

1 | INTRODUCTION

Snakes are prevalent creatures that exhibit a diverse array of physical characteristics and possess varying degrees of venomous capabilities.¹ In medicine, snakebites are a serious but sometimes ignored medical issue, and the exact burden of venomous snake bites is mainly unknown, particularly in Africa.^{2,3} The information on the frequency of snake bites that is currently available is highly inconsistent and frequently contradictory. There are 500,000 envenoming cases in Africa out of an estimated 1 million snake bites yearly.⁴ Local and systemic complications of snakebite have long been appreciated. These include local tissue necrosis and limb Gangrene, myotoxicity, coagulopathy and its associated bleeding,

thrombocytopenia, microangiopathic hemolytic anemia, thrombotic microangiopathy, acute kidney injury, neurotoxicity, cardiotoxicity.^{5,6}

Here, we report a 5-year-old boy who was bitten by a snake and presented to the Emergency department with complaints of significant infection, necrosis, and gangrene affecting the three fingers of his right hand. After clinical evaluation and investigations, the patient underwent surgical intervention.

2 | CASE REPORT

A five-year-old boy was bitten by a snake on the right hand about 2 weeks before his presentation to our hospital.

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The incident occurred during the evening while he was sleeping. The young boy failed to recognize the snake. He noticed minimal swelling from the fang sites and pain in the hand. Two days later, he was transported to a traditional healer, where some herbs were given to the wound without a tourniquet being placed around the hand. As the swelling in his hand grew over the next few days, he was taken to the rural hospital, where he was given intravenous antibiotics, intravenous hydration, and dressings. Unfortunately, lacking essential resources, the rural hospital could not access anti-venom, potent painkillers, and tetanus vaccine. Recognizing the severity of the case, the hospital referred the patient to our facility, and he was reached in our hospital 15 days after the snake bite.

On arrival at the emergency department of our hospital, the patient was conscious and complaining of exhibiting significant infection, necrosis, and gangrene affecting three fingers of the right hand (Figure 1). The initial assessment of the patient involved monitoring vital signs, including blood pressure of 90/50 mmHg, heart rate of 129 beats per minute, respiratory rate of 28 breaths per minute, temperature of 37°C, and oxygen saturation of 95% on room air. The patient was given intravenous fluids, antibiotics (Piperacillin-tazobactam plus clindamycin), and pain relief medication to manage his symptoms. The patient was also given tetanus toxoid injection to prevent secondary infections. The patient's blood was sent for laboratory investigations, which showed a low hemoglobin



FIGURE 1 Shows significant infection, necrosis, and gangrene affecting three fingers of the right hand.

level (7 mg/dL); otherwise, it was unremarkable. Based on the patient's clinical presentation and laboratory results, snake bite envenomation was diagnosed. The patient was started on anti-snake venom (ASV) therapy, the only specific treatment for snake bite envenomation.

The patient had gangrene in his right hand, which required surgical intervention. The affected portion of the hand was amputated to prevent the spread of the infection (Figure 2). We did Dis-Articulation of the 3rd, 4th, & 5th fingers at the metacarpo phalangeal joint. Following the procedure, we used a vacuum-assisted wound closure technique (VAC Therapy) to promote healing and prepare the wound for grafting. After the procedure, the patient received antibiotics to prevent infection and received wound dressing. After 3 days, the dressing covering the wound was taken off, and a surgical procedure was carried out to graft a piece of skin onto the area (Figure 3). Harvested a thin layer of skin from the front and side of the thigh and used it to cover the wound. Following the skin graft, the patient's hand was subjected to continued dressing changes every 48 hours to monitor the healing progress. During this healing period, the dressing changes were likely performed to monitor the wound's progress, ensure proper hygiene, and promote optimal healing conditions. Following a continuous ten-day period of dressing changes, it was evident that the wound had healed satisfactorily (Figure 4).

The patient's blood pressure, heart rate, respiratory rate, and oxygen saturation remained stable throughout the hospital stay. The patient was discharged from the hospital after 5 weeks of admission with advice to follow up with a primary care physician and physical rehabilitation



FIGURE 2 Shows three fingers of the right-hand amputation for snake bite gangrene.

FIGURE 3 Shows skin graft being applied to the amputated area of the right hand.



FIGURE 4 Reveals that the skin graft has sufficiently healed.

therapy to ensure the optimal healing and functionality of the affected hand.

3 | DISCUSSION

Snakebite is a significant global public health concern. According to estimates, there are 2.7 million incidents of snake envenoming globally, and each year, snakebites are thought to be the cause of 81,000–138,000 fatalities.⁶ Snake

venoms cause a variety of potentially fatal conditions affecting the nervous system (neurotoxicity), musculoskeletal system (myotoxicity), cardiovascular (cardiotoxicity), and blood clotting systems (haemotoxicity).⁶

In this case, the snakebite resulted in local tissue necrosis and limb gangrene in the left hand of the patient. In our knowledge, this was the first case of snake bite-related local tissue necrosis and limb gangrene that required surgical intervention. Unfortunately, lacking essential resources in the rural hospitals, the patient had no access to antivenom, potent painkillers, or the tetanus vaccine. It was not unexpected that the patient developed tissue necrosis and limb gangrene despite receiving treatment for 15 days following the snake bite. This suggests that either antivenom treatment was not administered or its effectiveness in this particular patient remains uncertain. The number of case reports on local tissue necrosis and limb gangrene was reported from Africa.^{5,7} Abbas et al. reported two cases of snakebite in children (A 5-year-old boy and a 6-year-old girl) in which there was envenomation with severe local tissue necrosis and gangrene that unfortunately led to significant limb amputation.⁵ Navaeifar et al. reported a case of a three-year-old boy who experienced a snake bite on his right hand. The bite resulted in two fang marks between the fourth and fifth fingers, accompanied by significant swelling in the right upper limb, indicating compartment syndrome.⁸ Their patient's symptoms have improved after receiving anti-snake venom, broad-spectrum antibiotics, and fasciotomy. A 3 month postoperative follow-up confirmed the patient's complete and functional recovery.

ASV remains the principal management option for patients with extensive local tissue swelling of the bite site and signs and symptoms of systemic envenomation, including coagulopathy and renal failure. However, there is

little evidence of its effectiveness in reversing gangrene.⁹ The several enzymes in snake venom contribute to tissue necrosis. Delay in presentation, bacterial infection, and unsanitary prehospital care may combine with tissue necrosis to make major amputation inevitable. All these factors operated in our patient.^{5,10} We believe that the delay in presentation and local envenoming was responsible for developing local tissue necrosis and limb gangrene, which made our patient's condition critical.

In conclusion, this case is the first reported case of snake bite leading to limb gangrene and amputation in Somalia. He was treated and fully recovered. Snake bites can cause significant morbidity and mortality, especially in children. In the current patient, gangrene was developed as a complication of snake bite envenomation. We believe that the delay in presentation and local envenoming was responsible for developing local tissue necrosis and limb gangrene, which made our patient's condition critical. Early surgical intervention was necessary to prevent infection and improve outcomes.

AUTHOR CONTRIBUTIONS

Sowdo Nur Iyow: Conceptualization; investigation; resources; writing – original draft. **Selim Turfan:** Supervision; writing – review and editing. **Yahye Abdulkadir Osman:** Data curation; resources; visualization. **Ahmet Huzeyfe Cetin:** Resources; supervision; validation; visualization; writing – review and editing. **Yusuf Jama Osman:** Data curation; investigation; resources; writing – original draft. **Mohamed Farah Yusuf Mohamud:** Conceptualization; data curation; formal analysis; investigation; writing – original draft; writing – review and editing.

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We declare that we have not received any financial support.

CONFLICT OF INTEREST STATEMENT

We declare that we have no conflicts of interest.

DATA AVAILABILITY STATEMENT

We declared that we had full access to all of the data in this study, and we take complete responsibility for the integrity of the data. All original data are available in the Mogadishu Somali Turkey Training and Research Hospital, Mogadishu, Somalia. Data used to support the findings of this study are available from the corresponding author upon request.

ETHICS STATEMENT

Based on the regulations of the review board of the Mogadishu Somali Turkish Training and Research Hospital, institutional review board approval is not required for case reports.

CONSENT

Written informed consent had obtained by the patient and his father to have the case details and any accompanying images published.

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