

CASE REPORT

Snakebite by the Shore Pit Viper (*Trimeresurus purpureomaculatus*) Treated With Polyvalent Antivenom



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Although snakebites are uncommon, there are several species of medically important venomous snakes native to Singapore. We present a case of envenoming by the shore pit viper (*Trimeresurus purpureomaculatus*) that showed clinical improvement when treated with the Indian (Haffkine) polyvalent antivenom. A 40-year-old man was bitten on his right hand by a snake, which was identified through photos and his description to be a shore pit viper, which is native to the local mangrove area. Severe swelling and pain developed immediately after the bite, which progressed up the arm. Because of the progression of local swelling, antivenom was started. He was given a total of 6 vials (60 mL) of polyvalent antivenom, with the first vial started 3 hours after the bite. He showed clinical improvement within 24 hours. His subsequent recovery was uneventful, with no other complications as a result of envenomation or antivenom use. Severe envenoming by the shore pit viper can lead to marked local effects such as extensive swelling and tissue necrosis. Antivenom is indicated in the presence of severe local envenomation. Antivenom against the shore pit viper is however not available locally. The Indian (Haffkine) polyvalent antivenom contains antibodies against 4 common venomous snakes in India, namely the Indian cobra, common krait, Russell's viper, and sawscaled viper. The improvement seen in this patient suggests possible cross-neutralizing activity of the Indian vipers' antivenom against the local shore pit viper venom. Further *in vivo* and *in vitro* studies should be performed to verify this clinical case.

Key words: snake, envenomation, shore pit viper, antivenom

Introduction

There are several species of medically important venomous snakes native to Singapore. They include the cobras (black spitting cobra, king cobra), vipers (shore pit viper, Wagler's pit viper), kraits (banded krait, Malayan krait), and coral snakes (blue and banded Malayan coral snake).^{1,2} However, specific antivenom for these species is not available for clinical use locally. We present a case of envenoming by the shore pit viper (*Trimeresurus purpureomaculatus*) that showed clinical improvement after treatment with the Indian (Haffkine) polyvalent antivenom.³

Case Report

A 40-year-old man presented to our hospital emergency department (ED) by ambulance 30 minutes after being

bitten on his right hand by a snake in a mangrove area in Singapore at approximately 1530 hours. He had a past medical history of alcoholic liver cirrhosis, but was not intoxicated during this incident. He described the snake to be brown in color with no bands, approximately 1 m long, with a triangular-shaped head and red slit eyes. He had previous occupational experience handling snakes (worked in a zoo) and was trying to catch the snake for his amusement when the snake bit his hand. He immediately flung the snake away. It was later photographically identified to be a shore pit viper, which is endemic in that area. His right hand started swelling 10 minutes after the snakebite. There were no first aid measures including ligature application attempted at scene.

On initial clinical examination, there were 2 puncture wounds approximately 1 cm apart seen over the base of the middle finger on the dorsum of the right hand. There was no bleeding, but marked erythema and swelling surrounding the puncture marks was observed on the dorsum of his hand, extending to involve his digits (Figure 1). He had normal vital signs and no

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Figure 1. Swelling of hand on arrival (1 hour after bite).

neurological abnormalities. The ring on his middle finger was removed immediately. He was empirically started on antibiotics (amoxicillin/clavulanic acid, 1.2 g IV) and given tetanus toxoid. Titrated doses of morphine were administered in view of severe pain (a pain score of 9 of 10 on arrival).

The swelling of his hand progressed to involve his right forearm within the first 90 minutes of observation in the hospital, and there was no relief of pain despite being given 10 mg of morphine. The toxicology service was consulted, and a decision was made to start antivenom. As antivenom for the shore pit viper is not available locally, the Haffkine polyvalent antivenom was used for this patient. He was given the first dose of antivenom (1 vial, 10 mL diluted in 250 mL of saline and infused over 2 hours) 3 hours after being bitten. Hydrocortisone 200 mg IV and diphenhydramine 25 mg IV were given just before its administration. The second dose of antivenom was administered approximately 2 hours after the first dose. The swelling, however, progressed proximally to involve his elbow and arm (Figure 2). Twelve hours after the injury, there was still progression of the swelling up his arm. During a period of 10 hours, he was given 4 further vials (total of 40 mL) of antivenom.

Seventeen hours after the bite, there was no further progression of the swelling, and there was marked improvement in his pain. At 24 hours, there was reduction in the swelling, and the pain had mostly resolved. By 72 hours, most of the swelling had resolved



Figure 2. Progression of swelling (5 hours after bite).

(Figure 3). His subsequent recovery was uneventful. The time of antivenom administration, together with the progress of his condition and subsequent recovery, is summarized in the Table. There was no coagulopathy attributable to the incident; the patient had a history of thrombocytopenia secondary to liver cirrhosis.

Discussion

Snakebites are uncommon in Singapore, and epidemiological data are limited. The hospital that the patient presented to is a 700-bed tertiary hospital in the eastern region of Singapore, with approximately 150,000 ED attendances a year and staffed with emergency physicians. It runs a toxicology service that provides 24-hour availability for consultations by a toxicologist. A retrospective study of snakebites presenting to this hospital



Figure 3. Resolution of swelling at 72 hours.

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