

CASE REPORT



Stephen's Banded Snake envenomation treated with tiger snake antivenom

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Abstract

Demonstration of the use of Tiger Snake Anti-venom in Stephen's Banded Snake envenomation is described. The patient presented with a clear history of a bite and a mild headache. Subsequently, the patient developed defibrination coagulopathy. A swab of the bite site reacted to the Tiger anti-venom on the Commonwealth Serum Laboratories anti-venom detection kit. Two ampoules of anti-venom were used. A mild allergic reaction to tiger snake antivenom developed. There was resolution of the coagulopathy.

Key words: *antivenins, disseminated intravascular coagulation, snake bites, snake venoms.*

A 27-year-old snake hobbyist presented with headache and stinging in his left index finger of 30 min duration. When returning a recently purchased Stephen's Banded Snake into a pillowcase, the patient received a bite on the tip of his index finger. The patient applied a venous compression bandage but no splint at the scene. There were no other symptoms of envenomation. He had not had any previous allergic reactions.

A single puncture on tip of index finger was visible. Examination was otherwise normal. The peak expiratory flow rate was 450 L/min (360–900 L/min).

The bite site was positive for tiger antivenom on the venom detection kit. Urine gave no result when tested with the venom detection kit. The venous compression bandage was left in place and a back slab applied to limb (see results in Table 1). After the first normal coagulation results and having tiger antivenom available, the compression bandage was removed. At 5 h following the bite, there was a marked fall in fibrinogen levels as well as an elevation of D dimer and prothrombin times. A single

ampoule of Tiger antivenom was given at 12 h after the bite. Despite premedication with adrenaline 0.25 mg subcutaneously and promethazine 50 mg intramuscularly, the patient developed urticaria and wheeze following the administration of tiger antivenom intravenously in the intensive care unit.

When results indicated undetectable fibrinogen (48 h since the bite), the patient received a further single ampoule of tiger snake antivenom. In addition, 4 units of fresh-frozen plasma were given. At 72 h there had been no macroscopic bleeding and improved coagulation results. The patient discharged himself prior to prophylactic steroids for serum sickness.

Discussion

Stephen's Banded Snake (*Hoplocephalus stephensii*) is one of three snakes in the genus *Hoplocephalus*. It is typically dark grey to almost black with wide cross

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Table 1. Progress – at hours since bite

	Day 1	Day 1	Day 1	Day 2	Day 2	Day 3
	1 h	5 h	8 h	16.5 h	23.5 h	45.5 h
Fibrinogen (mg/dL)	411	41	46	Nil	101	218
D dimer (mg/L)	Negative	>1.6	>1.6	>1.6	>1.6	0.4–0.8
Prothrombin time (s)	14	17	16	17	16	14
APPT (s)	28	37	32	>150	23	23
Platelet count ($\times 10^9/L$)	199		188		200	162
TT (11–15 s)					16	
Creatinine (60–125 mmol/L)	77	72	72		76	83
CK (24–204 U/L)		76	60	65		182
PEFR (L/min)	550	450				

APPT, activated partial thromboplastin time; CK, creatinine kinase; PEFR, peak expiratory flow rate; TT, thrombin time.

bands of a slightly lighter hue, often with pale or white markings around the lips or side of the head.

It is found in north-eastern coastal New South Wales. It is nocturnal and partly arboreal.

Hodgson and colleagues¹ describe neurotoxic activity in the mouse diaphragm and chick neck muscle following exposure to Stephen's Banded Snake venom, which resolved with tiger snake antivenom. In this case, there were neither symptoms nor signs of weakness. The peak expiratory flow rate showed a small reduction in two measurements over 5 h. There was no creatinine kinase elevation.

According to White,² none of these snakes is a frequent cause of envenomation and most cases occur (as did this one) in researchers or reptile keepers. He stated that human case reports described a defibrination coagulopathy and that no deaths have occurred, which is consistent with our report.

White² comments that, at the Commonwealth Serum Laboratories (CSL), tests on Stephen's Banded Snake failed to show reactivity in the Snake Venom Detection Kit. We in fact achieved a definite positive reaction in wells 1 (the control well) and 7. White, however, says tiger snake antivenom has been used with success for genus hydrocephalous, and suggests 2 to 4+ ampoules.

Tiger snake antivenom² has been recommended for use in envenomation after bites by members of the Australian tiger snake group which may contain myotoxins, neurotoxins and prothrombin converters. It has also been recommended for copperheads, the rough scaled snake, members of the black snake group and seasnakes. It is made from horse IgG. Each ampoule contains 3000 units of neutralizing capacity against the target venoms. Average volume per ampoule is 9–12 mL. The immunizing venom is common tiger snake venom, with sea snake venom used as an adjunct. Two ampoules were required

in this case of a well-described single bite. The potency of CSL antivenom for brown and tiger snakes has previously been questioned.³

The time to spontaneous resolution of the defibrination coagulopathy is not known in Stephen's Banded Snake. White⁴ says coagulopathy due to tiger snake could resolve spontaneously after 15–18 h. The coagulopathy should be treated due to the risk of major haemorrhage.³ Fatal cerebral haemorrhage has been described after tiger snake envenomation without antivenom use, although there are no descriptions of the management of Stephen's Banded envenomation without antivenom use. The coagulopathy of snakebite is routinely managed with antivenom rather than coagulation factor replacement, which occurred in this case.

There were mild reactions to the antivenom during both administrations despite use of antihistamine and subcutaneous adrenaline on both occasions. There was no subsequent hypotension. A database review has highlighted a high rate of allergic reactions to tiger snake antivenom.²

In summary, Stephen's Banded Snake is an unusual envenomation, which has had no human reports in the medical literature. Animal studies have demonstrated neurotoxicity; however, the case described had coagulopathy but not neurotoxicity. In this case, two vials of tiger snake antivenom were used and the defibrination resolved without morbidity. There was a mild reaction to tiger snake antivenom, which has previously been described.⁵

Competing interests

None declared.

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