

Vine snake (*Thelotornis capensis*) bite in a dog

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ABSTRACT

A vine snake bite in a dog is reported. There was continued minor bleeding from the assumed nose bite site for 4 days. Currently manufactured snakebite antivenom is not effective against vine snake bites and treatment is supportive.

Key words: canine, consumption coagulopathy, dog, *Thelotornis* spp., vine snake.

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INTRODUCTION

Vine snakes are a small group of highly specialised arboreal snakes that have very elongated bodies, lance-shaped heads and cryptic colouration. The savanna vine snake (*Thelotornis capensis*) can easily be mistaken for a dead twig or vine, averages 600–800 mm in length and is distributed KwaZulu-Natal, Mpumalanga and the Limpopo Province, South Africa, and Swaziland, Botswana, northern Namibia, Angola, Zimbabwe, Zambia and Mozambique, and extends along the east coast of Africa to Kenya and Somalia¹⁹. A venom enzyme with a molecular weight of 56 000 D is procoagulant by activating prothrombin and factor X², and disseminated intravascular coagulation (DIC) occurs.

Venom has no direct fibrinolytic activity, but accelerates fibrinolysis by activating plasminogen. Active bleeding occurs if venom haemorrhagins cause loss of capillary integrity and leaks²².

The snake is reluctant to bite. Of 9 reported human bites, mild, local, painless swelling was noted in 5, 3 did not bleed (although 1 had incoagulable blood), and the onset of bleeding, in 4 cases, was immediate (from fang punctures) and did not stop, soon, 1 hour 30 min, and 15 hours, respectively^{2,4,5,10,12,14,15,18,20}. In the same 4 cases bleeding improved at 40 hours, day 10, 30 hours and 40 hours. Two patients died, one at 36 hours from internal bleeding and the other at 18 days from multiple organ failure^{12,15}. There are no reported vine snake bites in animals. A

coagulopathy of similar aetiology is produced by boomslang (*Dispholidus typus*) envenomation and there is a report of a boomslang bite of a dog²¹.

CASE HISTORY

A 2-year-old female pug dog (8 kg) was bitten by a 90 cm vine snake during the afternoon of 18 March 2002. The following day the owners noted that the dog bled persistently from its nose. The dead snake (identified by a herpetologist), assumed to have bitten the dog, was found in the garden and both were taken to a veterinary practitioner. Examination showed an alert and excitable dog with continuous unilateral nose bleeding (exacerbated by sneezing) assumed to be the bite site, and no other abnormalities. Particular attention was paid to signs of internal and external bleeding and disseminated intravascular coagulation, including organ failure. Coagulation studies showed a haemostatic disturbance (Table 1). Supportive treatment was not necessary and the dog was observed for 3 days until the nasal bleeding stopped. There were never any other clinical signs of internal or external bleeding, including

a urinalysis and occult blood examination of all stool specimens. The laboratory findings are reported in Table 1. Further studies were not performed in view of expense.

DISCUSSION

All the above-mentioned 9 human vine snake bites were on the fingers, hand or wrist. Eight patients were handling the snake, while the other was disturbing it with a stick. As these snakes are reluctant to bite unless handled it would be expected that dogs would be bitten mostly on the head while holding the snake in their mouths. This was probably the case in this instance.

Venom toxicity is dependent on snake species and the venom volume to prey mass ratio⁸. All 9 human bites involved adults, while dogs are smaller and would be expected to be more severely envenomed. However, it is well known that venom sensitivity is dependent on animal species¹⁷.

It is assumed that the persistent unilateral nose bleed was due to a combination of fang trauma and a bleeding diathesis. The haematological abnormalities are compatible with what occurs in humans. Early platelet sparing may occur as venom-induced thrombin is different to physiological thrombin²² and does not easily aggregate platelets, while circulating fibrin degradation products tend to prevent aggregation¹³. It is known that DIC *per se* rapidly leads to multiple organ failure and has a poor prognosis. If associated with fibrinolysis which dissolves the widespread organ thrombi, the prognosis is improved. Consequently, fibrinolysis

Table 1: Haematology results.

Test	Normal values	19/3/2002	22/3/2002	25/3/2002
Haemoglobin	12.0–18.0 g/dl	16.5	14.5	
Haematocrit	0.37–0.55	0.473	0.434	
White cell count	6.0–17.0 × 10 ⁹ /l	14.91	15.88	
Platelets	200–900 × 10 ⁹ /l	251	204	
Reticulocytes	0.0–1.5 %	0.4	0.2	
INR	0.8–1.20	2.6	Failed to clot	0.9
APTT	11.0–9.0 sec	>120		14.4
Urea	3.6–8.9 mmol/l		9.1	

Serum creatinine, alkaline phosphatase and alanine transaminase were normal on 22 March 2002. INR, International Normalised Ratio: an internationally accepted way of expressing the ratio of the patients prothrombin time to that of the control. APPT, activated partial thromboplastin time.

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should not be prevented with fibrin-stabilising drugs²². Heparin is of no value in preventing thrombin formation^{2,3} which suggests that antithrombin III administration would probably be of no benefit, although the latter potentiated the effectiveness of antivenom given to Thai Russell's viper and Malayan pit viper envenomed rats^{11,16}. Boomslang (*Dispholidus typus*) venom produces a consumption coagulopathy by the same mechanism, but boomslang antivenom does not neutralise vine snake venom². Vine snake antivenom is not manufactured, as bites are uncommon.

Management of vine snake bites in animals with a coagulopathy would comprise maintenance of normovolaemia, and replacement of blood coagulation factors and haemoglobin by means of fresh whole blood, fresh plasma, fresh frozen plasma and platelets. Antibiotics are unnecessary in snakebite, unless there is a deep haematoma or necrosis⁶, due to a paucity of snake mouth bacteria⁹ and the antibacterial properties of snake venom⁷. The bites are painless but a headache may develop.

Should an animal be suspected of having been bitten by a snake in southern Africa and there is evidence of external or internal bleeding, a coagulation profile is helpful in treatment and identifying the snake. In humans, puff adder bites lead to significant, painful, tender bite site swelling with an associated thrombocytopenia, anaemia and occasional associated active bleeding. Boomslang and vine snake bites may lead to non-tender swelling and a consumption coagulopathy evidenced by falling haemoglobin, fibrinogen and platelets, the latter occur-

ring only after the coagulopathy is well established⁸. Fibrin monomers, fibrin degradation products and D-dimers are positive. Thrombo-elastography is a useful aid in diagnosis and management¹.

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