CASE REPORT

DIGITAL GANGRENE FOLLOWING A GREEN PIT VIPER BITE

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Abstract. In Hong Kong, the white-lipped green pit viper (*Trimeresurus albolabris*) accounts for the majority of venomous snake bites. In these patients, the cardinal features are local pain and swelling and mild coagulation abnormalities, but digital gangrene is uncommon. A 58-year-old woman was bitten on the left middle finger pulp by a white-lipped green pit viper. She developed local pain and swelling and coagulopathy, complicated by pulp tissue necrosis and digital gangrene of left middle finger. She fully recovered after amputation of the left middle finger at the mid portion.

Key words: digital gengrene, *Trimeresurus albolabris*, snake bite, Hong Kong

INTRODUCTION

In Hong Kong, the white-lipped green pit viper (*Trimeresurus albolabris*) accounts for the majority of venomous snake bites (Chan and Critchley, 1994). In these patients, the cardinal features are local pain and swelling and mild coagulation abnormalities (Chan *et al*, 1993). This is the first Hong Kong report of digital gangrene following a white-lipped green pit viper bite on the finger.

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CASE REPORT

A 58-year-old woman living in a semi-rural area of Hong Kong arrived at the hospital two hours after being bitten on the left middle finger pulp by a white-lipped green pit viper (*T. albolabris*). She complained of local pain and swelling. On examination, she was fully alert. Her blood pressure was 157/86 mmHg and pulse rate 80 beats/minute. There were swelling and numbness of the left hand up to the wrist. Small bruising was noted over the bite marks. She received anti-tetanus toxoid, prophylactic antibiotics, analgesic and wound dressing. Her left arm was elevated. Clotting profiles, a platelet count, renal and liver function tests were normal.

Demarcated darkening of the left middle finger tip appeared four hours after the bite. The International Normalised Ratio (INR) values at 22 and 28 hours af-

ter the bite were 1.79 and 1.40 and the APTT results were 39.6 and 38.4 seconds (normal 27-37 seconds). The platelet count was 83 x 10^9/l. On day 3, there were demarcated darkening of the distal one-third and pulp necrosis of the left middle finger. Her INR was 1.02, her APTT was 28.4 seconds, her plasma fibrinogen degradation product results was >200 μg/ml, her fibrinogen levels was 1.36 g/l (normal 1.65-3.63 g/l) and her platelet count was 89 x 10^9/l. Because of initial refusal by the patient, surgery was delayed until Day 4 (58 hours after the bite). The operative findings were pulp tissue necrosis of left middle finger, with visible capillary thrombosis and dead skin, a very tense compartment of the left middle finger up to the proximal phalanx and a very tense compartment over the dorsum of the left hand. Debridement of the finger pulp and fasciotomy of the left middle finger and dorsum of left hand were performed. On Day 4, the INR was 0.97, APTT 28.3 seconds and platelet count 104 x 10^9/l. Her left middle finger showed deterioration, with gangrenous changes by Day 5. Due to patient refusal of surgery, elective amputation of left middle finger at the mid portion was performed only on Day 17. When she was reviewed in the out-patient department on Day 31, her left finger wound had healed satisfactorily.

DISCUSSION

This case illustrates the potential problems associated with a *T. albolabris* bite: coagulopathy and local effects. The venom of *T. albolabris* contains 5 serine proteases with thrombin-like, fibrinolytic and plasminogen-activating activities (Rojnuckarin *et al*, 2006b). The resulting defibrination syndrome is manifested clinically as elevated fibrin degradation products, hypofibrinogenemia, a prolonged PT and APTT and mild thrombocytopenia (Chan and Critchley, 1994). Viperid snake venom metalloproteinases can damage blood vessel walls, thus increasing the risk of bleeding (Gutierrez *et al*, 2005). However, severe systemic bleeding is rare. Local effects, including pain and swelling, are more common (Chan *et al*, 1993). Local edema can be attributed to the phospholipases A_2 (through the releases of histamine and other pro-inflammatory cytokines) and metalloproteinases (fluid leakage into the interstitial space following destruction of the vascular wall) in the snake venom (Rojnuckarin *et al*, 2006a). Although the limb swelling can be severe and involve the whole affected limb, compartment syndrome is rare (Chan *et al*, 2003). Severe local complications, such as skin necrosis and digital gangrene, appear to be more common with green pit viper bites in Thailand than in Hong Kong (Chan *et al*, 1993; Rojnuckarin *et al*, 2006a). Skin necrosis is more common if blisters are present and bites occur on fingers or toes (Rojnuckarin *et al*, 1998). Snake venom metalloproteinases are implicated in skin necrosis after viper bites (Chotenimitkhun and Rojnuckarin, 2008). Digital gangrene is more common if blisters and ecchymosis are present (Chotenimitkhun and Rojnuckarin, 2008). In our patient with digital gangrene, the operative finding of visible capillary thrombosis is worth noting.

In patients with *T. albolabris* bites, systemic administration of antivenom will reverse the severe coagulopathy within hours, but cannot prevent skin necrosis if given after a mean latent period of 20.9 hours (Chotenimitkhun and Rojnuckarin, 2008). It is difficult to evaluate the effect of antivenom on digital gangrene, partly because this is an uncommon complication (Chotenimitkhun and Rojnuckarin, 2008).

When antivenom is recommended because of the presence of local envenoming, it may be effective only if the treatment can be given within the first few hours after the bite (Warrell, 1999).

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