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Selected Topics: Toxicology

WHITE-LIPPED TREE VIPER (*CRYPTELYTROPS ALBOLABRIS*) ENVENOMATION IN AN AMERICAN VIPER KEEPER

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☐ **Abstract—Background: Snakebites are common in many regions of the United States. Bites from exotic species, however, are rare. The white-lipped tree viper, *Cryptelytrops* (formerly *Trimeresurus*) *albolabris*, is a pit viper native to Southeast Asia. Bites are common in countries such as Myanmar, India, Thailand, Indonesia, and China. In this report, we describe an envenomation in an American viper keeper. Case Report: A healthy 28-year-old right-handed man who collects venomous snakes experienced a bite to the distal left thumb from a neonatal *C. albolabris* while feeding it. Upon arrival to the Emergency Department 30 min after the bite, the patient complained of significant pain and swelling that had progressed across his entire hand. He also experienced nausea, lightheadedness, mild dyspnea, and a burning sensation in his lungs. After discussing the risks and benefits, we elected to treat with five vials of Thai Red Cross Green Pit Viper antivenin. The patient was also treated with intravenous fluids, parenteral opioids, and ondansetron. He received an additional five vials due to worsening hematologic laboratory values. His laboratory tests normalized and his local findings improved significantly. He was asymptomatic at discharge and at multiple follow-up visits. Why Should an Emergency Physician Be Aware of This?: Envenomation by *C. albolabris* is characterized by local tissue injury and hematotoxicity. Supportive care and specific antivenom therapy comprise the management of these bites. This case reminds physicians that not all bites that present to the hospital will be from native snakes and helps direct emergency physicians to specific expertise and uncommon antivenoms.** © **2017 Elsevier Inc. All rights reserved.**

☐ **Keywords—*Cryptelytrops albolabris*; white-lipped tree viper; exotic snake; envenomation; antivenin**

INTRODUCTION

Snakebites are common in many regions of the United States, and most physicians in those areas are comfortable managing envenomations from endemic species. Exotic snakebites, however, are rare, and typically affect private collectors. Per the American Association of Poison Control Centers, only 79 of 3878 bites reported in 2015 were from nonnative species, including 42 from venomous snakes (1).

Statistics of exotic pet ownership in the United States are not readily available. Per a survey of exotic venomous snake collectors in Texas, the most popular species include Gaboon viper (*Bitis gabonica*), King cobra (*Ophiophagus hannah*), and Monocled cobra (*Naja kaouthia*). A less common species is the white-lipped tree viper (*Cryptelytrops albolabris*, previously *Trimeresurus albolabris*), also known as the green tree pit viper and white-lipped bamboo pit viper (Figure 1). Bites from *C. albolabris* are rare in the United States but common in countries such as Myanmar, India, Thailand, Indonesia, and China (2). The species accounts for nearly 95% of venomous snakebites in Bangkok and approximately 40% of overall snakebites in Thailand (2,3).

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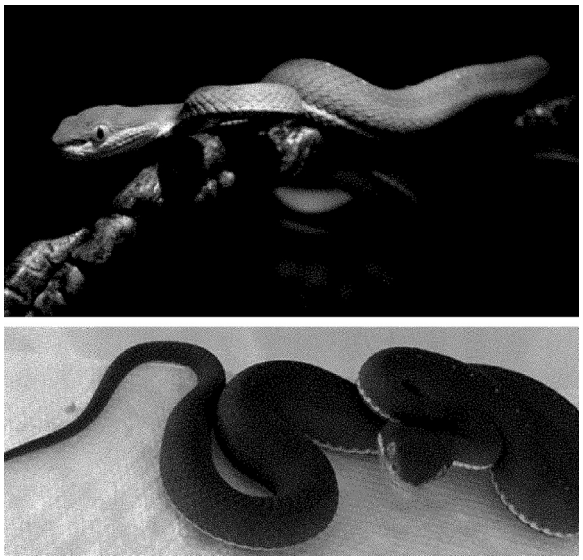

Figure 1. White-lipped tree viper (*Cryptelytrops albolabris*).

Initial management of *C. albolabris* bites is similar to that for envenomations from native crotalids, but the specific antivenom is different. Furthermore, the venom effects can produce distinct syndromes that many U.S. physicians may not anticipate. In this report, we discuss a *C. albolabris* envenomation that resulted in local tissue effects and mild coagulopathy that were successfully treated with exotic antivenom.

CASE REPORT

A healthy 28-year-old right-handed man who collects venomous snakes experienced a bite to the distal left thumb from a neonatal *C. albolabris* while feeding it. He immediately contacted one of the authors, who had previously treated him for a copperhead (*Agkistrodon contortrix*) envenomation. The physician serves as the snakebite consultant to the local zoo and arranged for the appropriate antivenom to be delivered to the emergency department (ED) of the hospital where the patient was to be treated.

Upon arrival to the ED 30 min after the bite, the patient complained of significant pain and swelling that had progressed across his entire hand. He also experienced nausea, lightheadedness, mild dyspnea, and a burning sensation in his lungs. His triage vital signs were: heart rate of 85 beats/min, blood pressure of 151/113 mm Hg, temperature 36.6°C (97.9°F), respiratory rate 20 breaths/min, and an oxygen saturation of 97%.

His examination revealed two small puncture wounds proximal to the nail bed, with significant edema of the entire digit. The remainder of the examination was unremarkable. His laboratory values included a prothrombin time (PT) of 13.1 s, a platelet count of 199 K/uL, hemoglobin of 16.3 g/dL, and a fibrinogen count of 217 mg/dL. A chest radiograph was normal.

Due to the rapidly spreading pain and swelling, and after discussing the risks and benefits, we elected to treat with equine-derived Thai Red Cross Green Pit Viper antivenin (Figure 2), which is indicated for envenomations from 40 + species of snakes from the seven genera into which the genus *Trimeresurus* was recently divided. Because the package insert does not specify a starting dose, we chose to use five vials initially, because a similar starting dose has been used in Thailand. The vials were reconstituted in 50 mL of sterile water and administered over 30 min. Skin testing was not performed because this is no longer recommended. Halfway through the infusion the patient reported mild itching of his feet. This resolved without intervention. The patient was also treated with a 1000-mL bolus of normal saline and received two 4-mg doses of morphine. The arm was splinted loosely and elevated. He was admitted to the ED observation unit, where he received one 50-μg dose of fentanyl and 4 mg of ondansetron.

His swelling and pain improved dramatically, but his repeat laboratory results trended in the wrong direction. Platelets decreased to 165 K/uL. PT rose to 13.7 s, and fibrinogen decreased to 180 mg/dL. We decided to treat with five additional vials, which the patient tolerated well.

The patient had no additional symptoms, and laboratory tests obtained 10 h later, just prior to discharge, showed improvement. Platelets rose to 175 K/uL. Fibrinogen returned at 199 mg/dL and PT decreased to 13.2 s. There were no local findings at discharge. The treating physician spoke with the patient twice weekly for the next few weeks, and the patient reported no new symptoms. The patient was examined in person approximately 3, 6, and 15 weeks post envenomation and there were no residual effects from the envenomation or its treatment.

Figure 2. Green Pit Viper antivenin (Thai Red Cross, Thailand).