

Common Snake and Insect Bites in Georgia

Christopher Martin, DPM

SNAKE BITES

Approximately 5,000 snakebites are reported annually to Poison Control Centers across the US. Of the venomous snake bites, approximately 42% are from moccasins. In the Southeastern US, copperhead snakes account for approximately 85% of reported snake envenomations (1,2). The venomous snakes in Georgia can be categorized into two groups: pit vipers and coral snakes. The pit vipers are further divided into the moccasins and the rattlesnakes. Two common types of moccasins in Georgia are the copperhead and the cottonmouth. The common rattlesnake types include the eastern diamondback, pygmy, and timber rattlesnakes.

Treatment for the aforementioned snakes rarely requires any intervention other than observation. The condition is self-limiting and can often be made worse by surgical or antivenin therapy. Treatments, such as tourniquets, incisions and various forms of suction are not recommended. Tourniquets can damage neurovascular structures and tendons, while suction can lead to secondary infection (3-5). It has been shown that the time of maximum swelling is within the first 36 hours of the bite; therefore it is recommended that patients be admitted for at least 36 hours, and evaluated every 2-4 hours for compartment syndrome (6). Although there is an antivenin available, it is rarely indicated. Considerations for the use of antivenin include elevated prothrombin time, decreased fibrinogen/platelets, and adverse systemic signs. The antivenin currently available on the market is CroFab. Introduced in 1990, it is a purified monovalent immunoglobulin obtained from sheep immunized against the western diamondback, eastern diamondback, Mojave rattlesnake, and the cottonmouth. The current recommendations for administration include initiation of treatment within 4-6 hours of the bite and administration of 4-6 vials (7). Severe cases may require up to an additional 40 vials.

Coral snakes account for less than 1% of venomous snake bites in the US. They have a characteristic banding pattern: red, yellow, black, yellow (8). A commonly known saying is "Red on yellow, kill a fellow; red on black, you're ok Jack." Coral snakes are relatively shy creatures, with most bites occurring due to intentionally handling them. It is recommended to admit bite victims for at least a 24-hour observation period because patients can have delayed

symptoms of up to 10-12 hours after the bite, with rapid progression of symptoms thereafter. Common symptoms include mild soft tissue swelling and local paresthesia at the site of the injury, altered mental status, and cranial nerve dysfunction. Initial treatment includes compressive dressing with immobilization of the affected limb (9,10). Due to an impending lack of antivenin, with the currently available antivenin scheduled to expire in April of 2017 (11), care is entirely supportive. Upon admission, patients need to be monitored for potential respiratory and cardiac collapse. The ability to perform continuous pulse oximetry and the ability to intubate are necessary. Overall, there is a great positive prognosis for coral snake bites (12).

SPIDER BITES

The most common venomous spider bites in Georgia are from the brown recluse and the black widow spiders. Most spider venom has little to no effect on human tissues, and therefore, most spiders do not pose a threat. The spiders most likely to inflict medically-significant harm include the brown recluse and the black widow spiders (13). To definitely diagnose a spider bite, the spider must be observed inflicting the bite, and the spider must be recovered and properly identified (13,14). Exclusion criteria, while not absolute, include multiple lesions on the same resident or multiple residents with probable spider bites. As an astute clinician, one must remember the possible differentials including infection, erythema migrans, herpes zoster, herpes simplex, or other common dermatoses.

Annually, there are approximately 2,500 reported incidents of black widow spider bites (15). Of those, there are no known cases of mortality in the US. The black widow is easily identified by its characteristic red/orange hourglass pattern on the ventral aspect of the abdomen. It also has a characteristic envenomation syndrome refractory to traditional analgesics consisting of severe pain, muscle cramping, abdominal and back pain, as well as hypertension (16,17). Hydromorphone, which provides symptomatic relief while the effects of the venom resolve (17), has been shown to be effective in combination with antivenin. There is a widely available antivenin, Latrodectus Mactans. It can be injected either intramuscularly or intravenously, with intravenous being the route of choice in severe cases or with patients under the age of 12. The antivenin requires

a single dose, and symptoms typically resolve in an average of 31 minutes (18). These patients usually will not need to be admitted, and they can be discharged once symptoms resolve.

The other commonly-found spider is the brown recluse, which is a brown spider with fairly nondescript appearance. It is often found in areas association with human habitats, preferring the dark, quiet, undisturbed areas of homes (19,20). It does have a fairly typical bite presentation consisting of a red plaque or papule with central pallor that may develop a necrotic, depressed center. Most bites resolve with minimal intervention, and heal without scarring (21). One should monitor the progression of healing for possible secondary bacterial infections, with signs of increased erythema, fluctuation, and suppuration being indicative of the need for antibiotics. Some studies have shown Dapsone to be effective at treatment of the necrotic center, with others showing the possibility to preemptively prevent the necrosis (22,23). Dapsone is not indicated in patients with a known G6PD deficiency as hemolytic anemia is a more common complication in patients with the deficiency. It is recommended to screen all patients for the deficiency if Dapsone is to be used (24). Administration is typically started after the development of a dusky center to the lesion, and continued for a 10-day course (23). Once the lesion demarcates, with or without use of Dapsone, one is able to debride and provide local wound care to facilitate closure of the wound.

TICK BITES

The tick is another commonly-found insect in the state of Georgia. The most common tick-borne disease in the US and Europe is Lyme disease, which is a spirochetal infection caused by *Borrelia burgdorferi*. Early identification and removal of the tick is key to the prevention of Lyme disease. Is it important to use proper technique with removal of a tick. After disinfecting the area of the bite with alcohol or betadine, it is recommended to remove the tick with forceps, using a firm, straight movement with even pressure (25).

There are several recognized factors affecting transmission of the disease. The tick must be a member of the *Ixodes* species, be of the nymphal stage, and have been attached for at least 72 hours or have been engorged prior to removal. Studies show a risk of Lyme disease of 0-1% if the tick is attached for less than 72 hours, but that risk increases to 20-25% if attached for longer than 72 hours (26,27). The treating physician should monitor the patient for erythema migrans for up to 30 days following the tick bite. It is recommended that patients who meet all criteria for antibiotic prophylaxis be offered a single dose of doxycycline: the tick must be a Deer Tick in the nymphal or adult state and have been attached for greater

than 36 hours. Prophylaxis should begin within 72 hours of the bite and the local rate of infection must be greater than 20%. Lastly, doxycycline must not be contraindicated. If the above criteria are met, then the treating physician can prescribe a single dose of doxycycline (28). If the patient is unable to take doxycycline, there are no recommended alternative antibiotics.

REFERENCES

1. Sullivan JB, Wingert WA, Norris RL Jr. North American venomous reptile bites. In: Auerbach PS, ed. Wilderness medicine: management of wilderness and environmental emergencies. St. Louis: Mosby-Year Book; 1995. p. 680-709.
2. Thorson A, Lavonas EJ, Rouse AM, Kerns WP. Copperhead envenomations in the Carolinas. *J Toxicol Clin Toxicol* 2003;41:29-35.
3. Gold BS, Dart RC, Barish RA. Bites of venomous snakes. *N Engl J Med* 2002;347:347.
4. Hall EL. Role of surgical intervention in the management of crotaline snake envenomation. *Ann Emerg Med* 2001;37:175-80.
5. Stewart ME, Greenland S, Hoffman JR. First-aid treatment of poisonous snakebite: are currently recommended procedures justified? *Ann Emerg Med* 1981;10:331-5.
6. Walker JP, Morrison RL. Current management of copperhead snakebite. *J Am Coll Surg* 2011;212:470-4.
7. CroFab Prescribing information. URL: https://www.crofab.com/CroFab/media/CroFab/PDF%20Files/CroFab-Prescribing_Information.
8. Cardwell MD. Recognizing dangerous snakes in the United States and Canada: a novel 3-step identification method. *Wilderness Environ Med* 2011;22:304-8.
9. German BT, Hack JB, Brewer K, et al. Pressure-immobilization bandages delay toxicity in a porcine model of eastern coral snake (*Micrurus fulvius fulvius*) envenomation. *Ann Emerg Med* 2005;45:603-8.
10. Gray S. Pressure immobilization of snakebite. *Wilderness Environ Med* 2003;14:70-1.
11. US Food and Drug. Expiration date extension for North American coral snake anti-venim through April 30, 2017. URL: <http://www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/ucm445083.htm>.
12. Wood A, Schauben J, Thundiyil J, Kunisaki T, Sollee D, Lewis-Younger C, et al. Review of Eastern coral snake (*Micrurus fulvius fulvius*) exposures managed by the Florida Poison Information Center Network: 1998-2010. *Clin Toxicol (Phila)* 2013;51:783-8.
13. Isbister GK, Fan HW. Spider bite. *Lancet* 2011;378:2039-47.
14. Vetter RS, Bush SP. Additional considerations in presumptive brown recluse spider bites and dapsone therapy. *Am J Emerg Med* 2004;22:494-5.
15. Bronstein AC, Spyker DA, Cantilena LR, Jr, Green JL, Rumack BH, Giffin SL. 2008 Annual report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 26th annual report. *Clin Toxicol (Phila)* 2009;47:911-1084.
16. Moss HS, Binder LS. A retrospective review of black widow spider envenomation. *Ann Emerg Med* 1987;16:188-92.
17. Offerman SR, Daubert GP, Clark RF. The treatment of black widow spider envenomation with antivenin *latrodectus mactans*: a case series. *Perm J* 2011;15:73-81.
18. Clark RF, Wethern-Kestner S, Vance MV, Gerkin R. Clinical presentation and treatment of black widow spider envenomation: a review of 163 cases. *Ann Emerg Med* 1992;21:782-7.
19. Vetter RS, Barger DK. An infestation of 2,055 brown recluse spiders (Araneae: Sicariidae) and no envenomations in a Kansas home: implications for bite diagnoses in nonendemic areas. *J Med Entomol* 2002;39:948-51.

20. Sandidge J. Predation by cosmopolitan spiders upon the medically significant pest species *Loxosceles reclusa* (Araneae: Sicariidae): limited possibilities for biological control. *J Econ Entomol* 2004;97:230-4.
21. Futrell JM. Loxoscelism. *Am J Med Sci* 1992;304:261.
22. King LE Jr, Rees RS. Dapsone treatment of a brown recluse bite. *J Am Med Assoc* 1983;250:648.
23. Barrett SM, Romine-Jenkins M, Fisher DE. Dapsone or electric shock therapy of brown recluse spider envenomation? *Ann Emerg Med* 1994;24:21-5.
24. Wolverton, SE. *Comprehensive dermatologic drug therapy*. Saunders, Philadelphia; 2001.
25. Needham GR. Evaluation of five popular methods for tick removal. *Pediatrics* 1985;75:997-1002.
26. Nadelman RB, Nowakowski J, Fish D, Falco RC, Freeman K, McKenna D, et al. Prophylaxis with single-dose doxycycline for the prevention of Lyme disease after an *Ixodes scapularis* tick bite. *N Engl J Med* 2001;345:79-84.
27. Sood SK, Salzman MB, Johnson BJ, et al. Duration of tick attachment as a predictor of the risk of Lyme disease in an area in which Lyme disease is endemic. *J Infect Dis* 1997;175:996-9.
28. Wormser GP, Dattwyler RJ, Shapiro ED, Halperin JJ, Steere AC, Klempner MS, et al. The clinical assessment, treatment, and prevention of Lyme disease, human granulocytic anaplasmosis, and babesiosis: clinical practice guidelines by the Infectious Diseases Society of America. *Clin Infect Dis* 2006;43:1089-134.



AUGMENT[®] Bone Graft

THE **FIRST** AND **ONLY**
PROVEN ALTERNATIVE
TO AUTOGRAFT IN
ANKLE AND HINDFOOT
ARTHRODESIS

Biologics.Marketing@wright.com
AugmentBoneGraft.com

™ and ® denote Trademarks and Registered Trademarks of Wright Medical Group N.V. or its affiliates.
©2017 Wright Medical Group N.V. or its affiliates. All Rights Reserved. MKS170-00

