



## VENOMOUS SNAKE BITE IN OUR BACKYARD

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### INTRODUCTION:

We report the case of a mid-50s aged male who was bitten by a wild venomous snake indigenous to Michigan and our management thereof to highlight the vigilance required to care for this potential exposure. Many may be unaware of the presence of indigenous venomous snakes in Michigan, the utility of the Snake Bite Severity Score, and the indications for antivenin administration.

### CASE:

A mid-50s aged male with medical history limited to ulnar claw hand deformity, presented with pain and blistering to the finger and hand after a snakebite. He describes walking through a local park when he reached to adjust some leaves. He suffered a bite to the index finger but was able to photograph the snake prior to presentation.

The photograph was reviewed and confirmed to be the Eastern Massasauga Rattlesnake (*Sistrurus catenatus*, Fig 1.), the only venomous snake indigenous to the state of Michigan (1).

He qualified for antivenom administration due to his systemic symptoms and the extent of local injury to his dominant hand. He was admitted to the Trauma/Burn ICU for extremity checks, monitoring post-antivenin, and plastic surgery consultation.

### DISCUSSION:

Rattlesnakes (*Crotalus* and *Sistrurus* spp.), water moccasins (*Agkistrodon piscivorus*, “cottonmouths”), and copperheads (*Agkistrodon contortrix*) are members of the family Viperidae, subfamily Crotalidae; commonly called pit vipers. Approximately 9,000 emergency visits nationwide are attributed to snake bites annually and, the vast majority are caused by the pit viper family (2). Envenomation syndromes include local tissue damage, systemic effects (nausea, diarrhea, weakness, diaphoresis), coagulopathy, rhabdomyolysis, increased vascular permeability, and neurotoxicity (paresthesias, seizures).

Eastern Massasaugas are found throughout the Lower Peninsula of Michigan. According to the *Michigan Herp Atlas*, only 32 sightings were recorded in 2019 (3), though we suspect this number is underreported. Snakes are poikilothermic and shelter underground during cold weather. Therefore, most snakebites occur between April and October as increasing temperature increases outdoor activity for both snakes and humans (2). Most bites occur when humans attempt to handle snakes (2). Unfortunately, snakes are becoming increasingly rare as wetland habitats are lost.

In the event of a bite, keep the individual calm and exit the area. Immobilize the affected body part and place at the level of the heart. Remove rings and watches and cleanse the wound. Tourniquets, incision, and suction are not indicated (2) and may cause harm. Identification is recommended via photograph as long as attempts do not endanger patient or rescuer. Transport the patient for medical evaluation (2).

Evaluation includes a history and physical exam, with close attention paid

to the bite site and surrounding area, as well as assessment for secondary injury or systemic effects. Swelling, ecchymoses, and blistering suggest envenomation. Systemic reactions indicate severe envenomation, with hypotension and altered mental status. Baseline testing includes CBC, electrolytes, Cr, BUN, CK, PT/INR, PTT, D-dimer, Fibrinogen, UA, and EKG. Consider superficial debridement, though recent clinical practice leans toward less aggressive measures (2). Additional management includes local wound care and tetanus administration. Prophylactic antibiotics are not recommended (2),

Antivenom is the mainstay of treatment for significant envenomation. The wound should be monitored for any resulting compartment syndrome. Fentanyl and hydromorphone are recommended while morphine and NSAIDs are avoided due to risk of IgE reaction and bleeding risk, respectively. Coagulopathy is caused by thrombin-like glycoproteins within the venom, and thrombocytopenia. Transfused replacement platelets and FFP are inactivated by circulating venom and are therefore not generally recommended (2).

Our patient was a candidate for antivenom based on moderate envenomation by Snake Bite Severity Score (4). During administration of  
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