

ST elevation myocardial infarction presenting as complication of *Crotalus horridus* envenomation

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Background

- Myocardial infarction (MI) has been reported previously as a complication of snake envenomation^{1-7,9}
- ST elevation MI (STEMI) has not been previously reported as a complication of North American crotaline envenomation
- MI is typically a result of increased cardiac metabolic demand or decreased oxygen delivery via coronary arteries

Hypothesis

- *Crotalus horridus* (Figure 1) envenomation may cause MI by increasing the risk of thrombus formation along with increasing myocardial oxygen demand



Figure 1. *Crotalus horridus*, canebrake rattlesnake. Photo courtesy of Scott Pfaff, Curator of Herpetology, Riverbanks Zoo and Garden, Columbia, SC

Case Report

- A 72 year-old male was bitten by a juvenile canebrake rattlesnake on the left hand
- Enroute to the emergency department (ED) the patient developed chest pain and hypotension
- Vital signs on arrival were T 97.4, HR 89, RR 28, BP 96/72, SpO₂ 100% on non-rebreather mask

Case Report (continued)

- Swelling and a single puncture wound were noted on the dorsal left hand
- Initial EKG demonstrated ST elevation in leads II, III, and aVF (Figure 2)
- Laboratory results included WBC 9.7, Hgb 13.2, Plt 524, PT/INR 12.3/0.9, PTT 28.9, fibrinogen 712 mg/dL, and troponin I 0.00

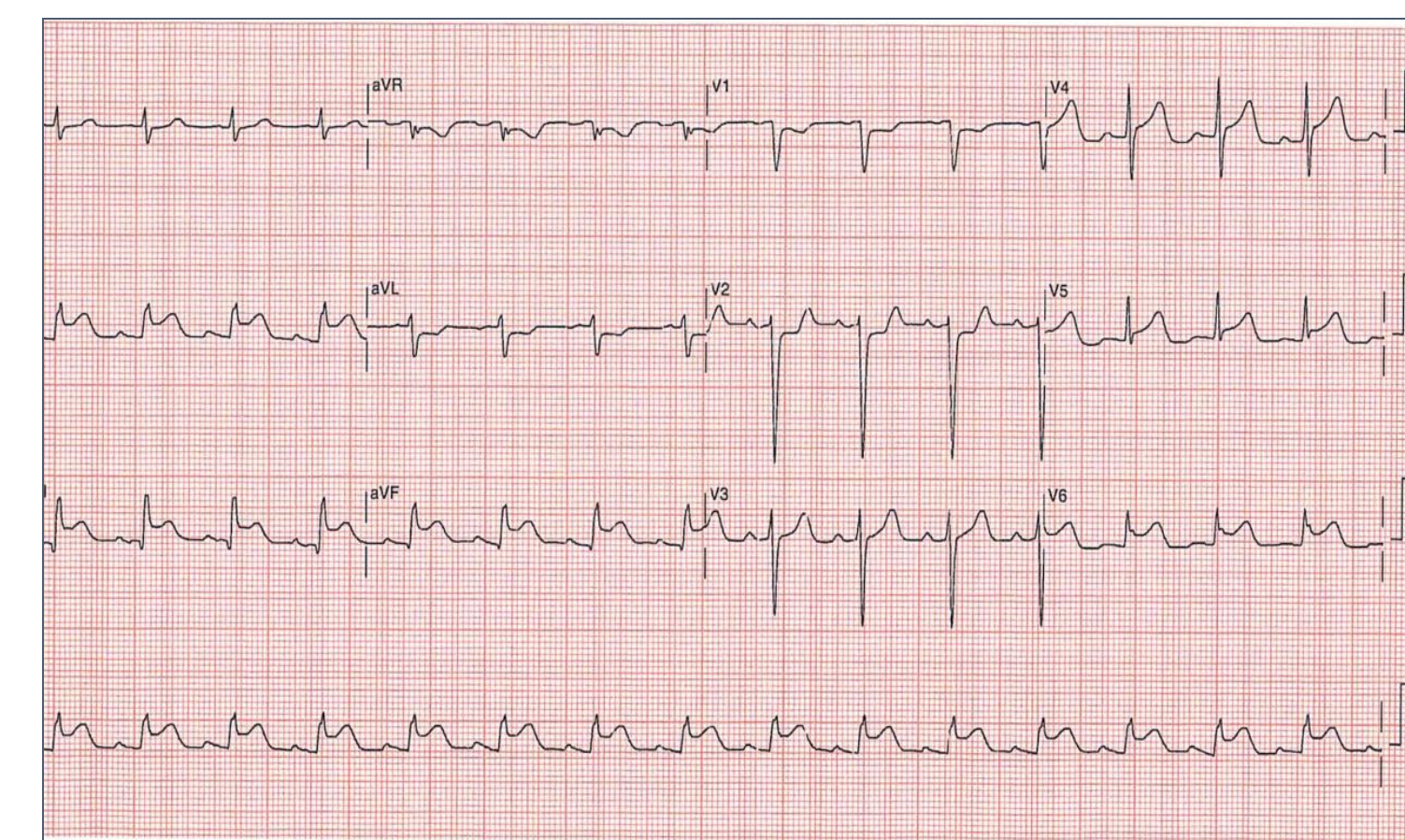


Figure 2. Electrocardiogram on admission to ED.

- Hypotension resolved after a 1000 cc bolus of 0.9% saline
- Rectal aspirin 300 mg, heparin 5000 units IV, and 6 vials of crotaline Fab antivenom were administered in the ED
- Eptifibatide was given as a 180 µg/kg bolus and 2 µg/kg/min infusion for 18 hours
- Intubated for acute respiratory failure and hypoxia
- Emergent cardiac catheterization revealed a circumflex artery with 70%-80% mid-vessel stenosis with thrombus formation with additional thrombus formation distally
- There was no residual obstruction after thrombectomy and stent implantation
- Troponin I peaked at 19.18 ng/mL
- In total, 14 vials of crotaline Fab antivenom were administered
- Started clopidogrel 75 mg daily on hospital day 2

Case Report (continued)

- Extubated on hospital day 2
- Did not develop any evidence of coagulopathy, thrombocytopenia, or hypofibrinogenemia
- Discharged home in good condition on hospital day 6

Discussion

- Complex hematologic abnormalities such as platelet aggregation and coagulopathy are well described following crotaline envenomation, including recognized species-dependent effects
- In this patient with mild coronary atherosclerosis, thrombus formation could be a complication of the hemotoxic venom effect of *Crotalus horridus*⁸
- With the common use of anticoagulation and platelet-inhibiting medications in the setting of STEMI, management of STEMI in conjunction with crotaline envenomation presents unique challenges

Conclusions

- STEMI is a rare but potential life-threatening complication of North American crotaline envenomation

References

1. Blondheim DS et al. Acute myocardial infarction complicating Viper Bite. *Am J Cardiol.* 1996 Aug 15;78(4):492-493.
2. Gaballa M, et al. Myocardial Infarction as a Rare Consequence of a Snakebite: Diagnosis With Novel Echocardiographic Tissue Doppler Techniques. *Circulation.* Sep 13;112(11):e140-2.
3. Maheshwari M, Mittal SR. Acute Myocardial Infarction Complicating Snake Bite. *J Assoc Physicians India.* 2004 Jan;52:63-64.
4. Naidoo DP, Lockhat HS, Naiker IP. Myocardial infarction after probable black mamba envenomation. *S Afr Med J.* 1987 Mar 21; 71(6):388-389.
5. Niraj M et al. Acute myocardial infarction following a Russell's viper bite: a case report. *Int Arch of Med.* 2013;6:7
6. Saadeh AM. Case Report: Acute Myocardial Infarction Complicating A Viper Bite. *Am J Trop Med Hyg.* 2001 May-Jun;64(5-6):280-2.
7. Satish R et al. Acute MI in a stented patient following snake bite-possibility of stent thrombosis—A case report. *Indian Heart J.* 2013 May-Jun;65(3):327-30.
8. Schmaier AL, Colman RW. Crotalocytin: Characterization of the Timber Rattlesnake Platelet Activating Protein. *Blood.* 1980 Dec;56(6):1020-1028.
9. Silva A, Pilapitiya S, Siribaddana S. Acute Myocardial Infarction following a possible direct intravenous bite of Russell's viper (*Daboia russellii*). *BMC Res Notes.* 2013 Feb 23;6(1):7.