

Case Report

Scorpion Sting Masquerading As Myocardial Infarction

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Abstract

Scorpion stings are common in rural India and envenomation by scorpions can result in a wide range of clinical effects, including, cardiotoxicity, neurotoxicity and respiratory dysfunction. In general, scorpions are not aggressive. They do not hunt for prey; they wait for it. Scorpions are nocturnal creatures; they hunt during the night and hide in crevices. Scorpion venom is a water-soluble, antigenic, heterogenous mixture, as demonstrated on electrophoresis studies. Out of 1500 scorpion species known to exist, about 30 are of medical importance. The life-threatening complication of myocarditis and pulmonary edema is known in red scorpion. Most deaths occur during the first 24 hours after the sting and are secondary to respiratory or cardiovascular failure. In spite of advances in patho-physiology and therapy the mortality remains high in rural areas due to lack of access to medical facilities. In absence of clear history, the cardiac toxicity of scorpion sting may be misdiagnosed.

Key Words: Scorpion Sting, Myocardial Infarction, Envenomation, Cardiotoxicity

Introduction:

Scorpions are shy creatures and only sting if threatened. Indian red scorpion (*Mesobuthus tamulus*) is one of the most toxic envenomation in animal kingdom. Scorpion stings cause a wide range of conditions, from severe local skin reactions to neurologic, respiratory, and cardiovascular collapse. Early medical attention is crucial part of treatment. But situation may be difficult to manage if patient presents late, and history of scorpion sting could not be elicited. But the still worse may be the situation where the patient's investigation misleads you to some other diagnosis where treatment modality is entirely different.

Case History:

A 17-year-old male laborer, living alone in farmhouse, found unconscious in his room and brought by his friends in emergency room with BP less and pulse less condition, with froth from mouth with stertorous breathing. No other positive history could be elicited from patient's friends.

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On examination pupils were mid-dilated sluggishly reacting to light, CVS examination revealed tachycardia with summation gallop, chest examination – B/L wet crepitation up to the mid thoracic region, and spO₂ at the time of presentation was 66%. C T head and random blood sugar were within normal limits.

ECG suggested ST segment elevation from v2-v6 with upward coving (Fig.1); chest radiograph was suggestive of the pulmonary edema. (Fig. 2) Based on finding a provisional diagnosis of the acute anterior wall myocardial infarction with pulmonary edema with shock with hypoxic encephalopathy was made and patient was shifted to ICCU and managed by giving Dobutamine infusion at the rate of 2.5-10 Microgm/kg/min along with mechanical ventilatory support.

Patient responded to the treatment and his blood pressure and SPO₂ improved, once his systolic BP stabilized to 90mmHg, single IV dose of 20mg Frusemide given. Following the dose of diuretic, crepitation in chest decreased, and gradually weaned out of the ventilatory support in 24 hours with minimal basal crepitation.

Patient regained consciousness and after regaining consciousness a further history was taken from patient. Patient disclosed the fact that he was stung by a scorpion in small finger of left hand in the mid of night, but he could not seek medical help as he was far from the medical facility and no one was around him to help him. Soon after the scorpion sting he had several vomiting and sweating, and later he

developed excessive breathlessness with cough, followed by loss of consciousness.

Based on the history the diagnosis was revised, and a diagnosis of scorpion sting with Myocarditis with pulmonary edema with shock was made.

On investigation Hb 16 gm/dl, TLC 26800 cells/cc, P₈₃, L₁₄, S. bilirubin 0.8 mg/dl, SGPT- 54IU/L, SGOT- 115 IU/L, S. Creatinine- 1.4 mg/dl, CK (MB)- 112, Troponin t – positive. Echocardiography revealed moderate global hypokinesia of LV, LV globular in shape, LVEF 40-42%, mild MR.

Patient gradually became haemodynamically stable and inotropes weaned on 3rd day, diuretics was given for 5 days and he continued to show improvement, anti venom could not be used because of non availability, the ECG changes gradually settled to the normal on the tenth day and repeat echocardiography suggested improvement of LV function with LVEF 55 %. Patient was discharged on tenth day from the hospital.

Discussion:

Scorpion venom is a water-soluble, antigenic, heterogenous mixture, as demonstrated on electrophoresis studies. This heterogeneity accounts for the variable patient reactions to the scorpion sting. [1]

Scorpion venom contains a neurotoxin, haemolysins, agglutinins, haemorrhagins, leucocytolysins, coagulins, ferments, lecithin and cholesterin. [2] The clinical manifestations, pathological lesions and electrocardiographic changes are due to sudden massive liberation of catecholamines in to circulation. Both sympathetic and parasympathetic twigs are stimulated.

Most deaths occur during the first 24 hours after the sting and are secondary to respiratory or cardiovascular failure resulting from autonomic excitation. Cardiac dysfunctions attributed to catecholamine-induced increases in myocardial metabolism and oxygen demand.

It leads to myocardial ischemia-induced myocardial hypoperfusion and to the direct effects of the toxin (leading to Myocarditis).

Victim can die suddenly due to lethal ventricular arrhythmias, which occur within 15-30 minutes of sting. Several types of arrhythmias (both tacky and Brady types) have been reported. [3, 4] The ECG changes are nonspecific but may sometimes suggest myocardial infarction. [5, 6] Development of early pulmonary edema is also an ominous feature in scorpion sting.

Early presentation and treatment especially by alpha-receptor blockers have improved the prognosis. Prazosin decreases the after load and pre load and helps to prevent cardiotoxicity. Bawaskar and Bawaskar reported in their study that the development of pulmonary edema 4-8 hours after scorpion sting even in hospital settings and recommended early Prazosin medication by rural health workers to prevent pulmonary edema. [7]

Since our patients presented late, contrary to common presentation of hypertension requiring Prazosin, [8] patients had hypotension and hypoxemia. Thus the first line of treatment in our case was respiratory support with intubation with mechanical ventilation and inotropes in the form of dobutamine infusion.

Factors like hypoxemia and hypercarbia contribute to pulmonary hypertension. Hyperoxygenation by positive pressure ventilation at high FiO₂ helped to reduce pulmonary hypertension. PEEP helped by alveolar recruitment and by shifting edema fluid away from the alveoli. In severe scorpion envenomation, dobutamine infusion is reported to improve impaired heart function. [8]

In our case not only presentation was late but also history suggestive of scorpion sting was also not available as the patient was unconscious. Initial presentation with frank ST segment elevation with pulmonary edema may be mistaken as acute myocardial infarction with pulmonary edema specially if the patient is having various risk factors for development of coronary event but similar situation in a young patient with no risks for coronary artery disease should make one to think of other causes of ST segment elevation with pulmonary edema.

But the fact that advanced coronary events has been reported at very young age in Indian population make situation difficult to diagnose in emergency room with few investigations.

Conclusion:

Unsuspected scorpion sting presenting with ST segment elevation may be a diagnostic dilemma if the history of scorpion sting is unavailable. Timely diagnosis of scorpion Myocarditis with pulmonary edema and the initiation of ventilatory and inotropic support in ICU was the mainstay in treatment.

References:

1. Chippaux JP, Goyffon M. Epidemiology of scorpionism: a global appraisal. *Acta Trop* 2008; 107:71-9.
2. Modi, N. J.: "Modi's Textbook of Medical Jurisprudence and Toxicology." 24th Edition, N. M. Tripathi Pvt. Ltd., Princess Street, Bombay, 1977, p. 633

3. **Gueron, M., Adolph, R. J., Grupp, I. L., Gabel, M., Grupp, G. and Fowler, N. O.:** Hemodynamic and myocardial consequences of scorpion venom. *Amer. J. Cardiol.*, 45: 979-986, 1980.
4. **Shah, S. S., Doshi, H. V. and Kulkarni, P. S.:** Myocarditis from scorpion sting. *Indian Heart J.*, 24: 52-55, 1975. Bawaskar HS, Bawaskar PH. Prazosin therapy and scorpion envenomation. *J Assoc Physicians India* 2000; 48:1175-80.
5. **Gueron, M., Stern, J. and Cohen, W.:** Severe myocardial damage and heart failure in scorpion sting. Report of five cases. *Amer. J. Cardiol.*, 19: 719-726, 1967.
6. **Poon-King, T.:** Myocarditis from scorpion stings. *Brit. Med. J.*, 1: 374-377, 1963.
7. **Bawaskar HS, Bawaskar PH.** Prazosin therapy and scorpion envenomation. *J Assoc Physicians India* 2000; 48:1175-80. Bawaskar HS, Bawaskar PH. Management of the cardiovascular manifestations of poisoning by the Indian red scorpion (*Mesobuthus tamulus*). *Br Heart J* 1992; 68:478-80.
8. **Eltrous S., Semir Nouira, Lamia Besbes et al.** Dobutamine in Severe Scorpion Envenomation: Effects on Standard haemodynamics Right ventricular Performance & Tissue Oxygenation. *Chest* 1999; 116:748-753.

Fig. 2: X- ray chest PA view showing Globular Cardiac Shadow with Bilateral Increased Hilar Prominence (suggestive of pulmonary edema)



Fig.1: ECG showing Sinus Tachycardia with significant ST elevation in leads V₂ to V₆ on day of Admission

