# Uncommon Presentation of Scorpion Envenomation: A Case Report

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**ABSTRACT**

**Introduction:** Scorpion bites are common in India, particularly in the rural areas. The etiology of the cardiovascular manifestations in severe scorpion sting is related to the venom effects on the sympathetic nervous system and the adrenal secretion of catecholamines as well as to the toxic effects of the venom on the myocardium.

**Case report:** Here we are reporting a case of 45 years male patient with scorpion bite presented with chest pain and perspiration. Patient was treated aggressively with Non Invasive ventilation (NIV), anticoagulation, dual antiplatelets, statins and alpha blocker (Prazocin).

**Conclusion:** Cardiac manifestations like myocarditis, pulmonary oedema and cardiologic shock after scorpion envenomation was observed and can

**Keywords:** Scorpion Bite, Cardiovascular Manifestations, Catecholamines, Prazocin

## INTRODUCTION

Scorpion bites are common in India, particularly in the rural areas. Among 86 species of scorpions present in India, Mesobuthus tumulus (Indian red scorpion) and Heterometrus swammerdami are of medical importance.[1] Though local symptoms including severe pain and burning sensation at the site of sting are the most common manifestations, systemic complications can ensue.[2] Cardiovascular manifestations are particularly prominent following stings by Indian red scorpion.[3] Such bites infrequently have serious sequelae, including myocarditis, acute pulmonary oedema, life threatening cardiac arrhythmias, cardiogenic shock and even death.

## CASE REPORT

A 45 years old male patient was admitted with history of red scorpion bite between ring and little finger on left side while working in farm. It was followed by retrosternal cardiac chest pain which was radiating to left arm associated with perspiration and breathlessness. There was no significant any medical illness in past. On admission pulse was 48 beats/min irregular and Blood Pressure was 80/60 mm Hg. Patient had signs of autonomic dysfunction in the form of hypotension, bradycardia and pulmonary oedema. Systemic examination revealed bilateral basal rales on auscultation.

On the basis of clinical history, laboratory reports, ECG and chest radiogram we diagnosed the patient as Scorpion bite with pulmonary oedema, myocarditis, autonomic

| Laboratory parameter | Value |
|---|---|
| Haemoglobin | 14.3g/dl |
| Total leucocytes count | 18500/ul |
| Platelet count | 2.4 lakh/ul |
| Prothrombin time-INR | 1.3 |
| Random Blood sugar | 128 mg/dl |
| Blood Urea | 28 mg/dl |
| Serum Creatinine | 1.0 mg/dl |
| Serum Sodium | 136 meq/l |
| Serum Potassium | 3.6 meq/l |
| Serum Calcium | 10.4 mg/dl |
| Serum Magnesium | 2.2 mg/dl |
| Serum Phosphorus | 4.4 mg/dl |
| Creatine kinase- MB | 640 ng/ml (0-3.7ng/ml) |
| Serum troponin I | 149 ng/ml (<0.06 ng/ml) |

**Table-1:** Laboratory investigations at the time of admission

| | |
|---|---|
| 2D ECHO | LVEF-35% (Moderate LV systolic dysfunction)<br>Dilated LV, posterior wall, inferior wall and basal anterolateral wall akinetic.<br>Grade I diastolic dysfunction.<br>Moderate MR, Moderate PH<br>RVSP 60 mm Hg. |
| CAG | LMCA-normal<br>RCA- normal<br>LAD- 30-40% plaque<br>LCX- 30-40% stenosis |

**Table-2:** Echocardiography and angiogram findings

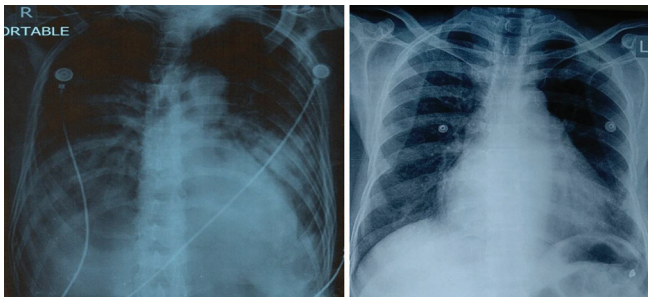

**Figure-1:** Chest radiogram on day of admission shows pulmonary oedema and cardiomegaly; **Figure-2:** Chest radiogram on day of discharge shows reduced cardiomegaly

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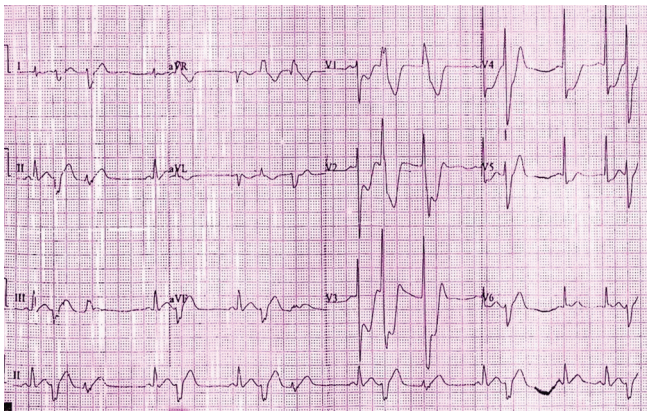

**Figure-3:** Twelve Lead ECG on admission shows- Low voltage, poor 'r' wave progression and ventricular premature complexes (bigemini and trigemini), ST segment depression in $V_1$to $V_4$

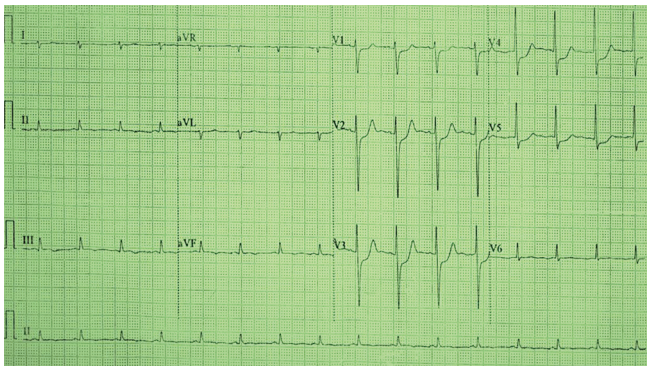

**Figure-4:** ECG on discharge shows low voltage, with reduced ST segment depression in $V_1$-$V_5$

dysfunction and cardiac arrhythmias. We have treated this patient with Non Invasive ventilation (NIV), Inotrops, Heparin, dual antiplatelets, statins, nitrates and Prazocin.

On 5th day of admission 2D Echocardiography and Doppler study and Coronary angiography was done (Table 2).

Patient was discharged on dual antiplatelets, statins, Digoxin and Ramipril.

## DISCUSSION

The scorpion venom is water soluble antigenic complex mixture of neurotoxin, cardiotoxin, nephrotoxin, hemolysins, phosphodiesterases, phospholipase, hyaluronidases, histamine and other chemicals.[2] The venom can cause myocardial damage by several pathogenetic mechanisms:

**Myocardial ischemia by coronary spasm**: Release of vasoactive, inflammatory and thrombogenic peptides and amine constituents (histamine, serotonin, bradykinin, leukotrienes, thromboxane), which act on the coronary vasculature and induce coronary artery vasospasm and facilitate platelet aggregation as well as thrombosis.[4]

**Direct cardiotoxic effect of the venom** causing toxic myocarditis by reduction of Na-K-ATPase and adrenergic myocarditis by releasing adrenaline and noradrenaline from neurons, ganglia and adrenals, thereby increasing myocardial oxygen demand by direct inotropic and chronotropic effect on already compromised myocardial blood supply.[5]

**Anaphylactic reaction**: Release of allergenic proteins causes anaphylactic shock leading to hypotension with vasodilation and decreased of intravascular volume with reduced myocardial perfusion.

Scorpion venom inhibits angiotensin converting enzyme (ACE), resulting in accumulation of bradykinin, which is implicated in the development of pulmonary edema.[6]

Bahloul *et al* examined the histopathology of two fatal myocarditis causes resulting from a scorpion bite, revealed a mixed picture of toxic myocarditis and coagulative myocytolysis, similar to catecholamine-induced cardiomyopathy.[7-9]

Valdivia *et al* reported a series of 32 children with scorpion bite who developed cardiac complications. Among this 50% exhibited myocarditis, 12.5% had subclinical disease, 63% had observed ECG changes.[10]

In our patient, Scorpion bite induced pulmonary oedema including clinical symptoms, dynamic changes of ECG and elevated cardiac enzymes were present. Probably, coronary artery vasospasm induced by scorpion envenomation has precipitated everything in present case. Pulmonary oedema occurs very rarely after a scorpion envenomization. There are a few cases of shock and pulmonary oedema due to scorpion bites reported in the literature.[7,8]

## CONCLUSION

Cardiac manifestations like myocarditis, pulmonary oedema and cardiologic shock after scorpion envenomation was observed in present case and was managed by supportive measures and Prazocin (alpha adrenergic blocker). In present case report ECG changes (ventricular premature complexes and ischaemic changes), hypotension and bradycardia were present, hence it is recommended to monitor each patient with scorpion bite to prevent dreadful cardiac catastrophic event.

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