

Rapidly improving acute myocarditis after a scorpion sting

Akrep sokması sonrası hızla iyileşen akut miyokardit

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Summary– Cases with scorpion sting envenomation have usually a benign course, but fatalities especially due to cardiovascular complications have been reported. Local reactions at the site of the sting, and as well as organ dysfunction due to the systemic effects of its toxin have been indicated. As a result of the toxic effects of the scorpion toxin on the cardiovascular system, hypertension, arrhythmias, myocarditis, acute heart failure, and pulmonary edema may occur. In this report, we present a 49-year-old male patient who was admitted to our hospital with acute pulmonary edema and respiratory distress following scorpion sting at the wrist. In this case, immediate improvement of diffuse left ventricular systolic dysfunction on presentation with medical treatment, and increased troponin levels in the absence of critical stenosis on coronary angiograms suggested the diagnosis of acute myocarditis associated with scorpion bite.

Özet– Akrep sokması zehirlenmesi olguları genellikle benign seyirli olmakla birlikte özellikle kardiyovasküler komplikasyonlar nedeniyle ölümlerle sonuçlanan olgular da bildirilmiştir. Hastalarda ısırılma yerindeki lokal reaksiyonların yanı sıra toksinin sistemik etkilerine bağlı organ fonksiyon bozuklukları olabilmektedir. Akrep toksinin kardiyovasküler sistem üzerine etkileri sonucunda hipertansiyon, aritmi, miyokardit, akut kalp yetersizliği ve akciğer ödemi ortaya çıkabilmektedir. Burada el bileğinden akrep sokmasının ardından solunum sıkıntısı başlayan ve akut akciğer ödemi tablosunda hastanemize başvuran 49 yaşındaki erkek hasta sunuldu. Olguda başvuru esnasında saptanan yaygın sol ventrikül sistolik fonksiyon bozukluğunun tıbbi tedavi ile kısa sürede düzelmesi ve koroner anjiyografide kritik darlık olmamasına rağmen troponin artışı akrep sokması ile ilişkili akut miyokardit tanısını düşündürmüştür.

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Abbreviations:

EKG *Electrocardiography*

TTE *Transthoracic echocardiography*

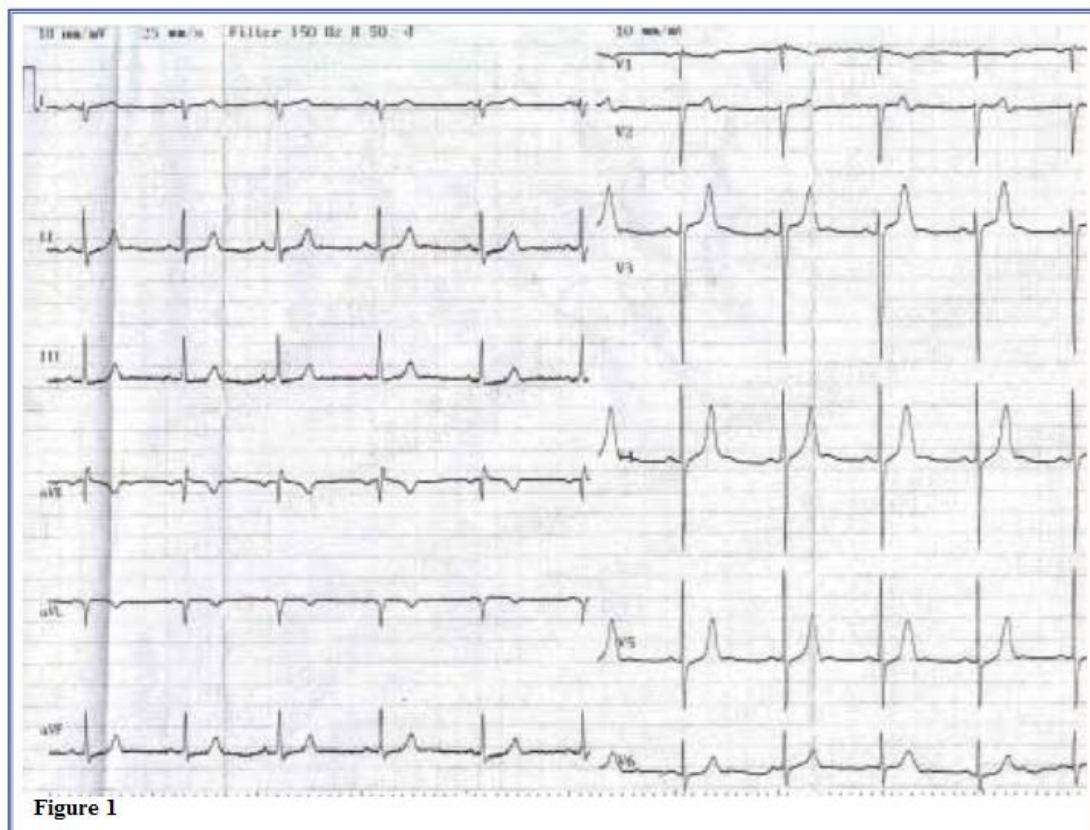
Scorpion venom poisoning which is usually of benign nature can occasionally lead to fatal cardiovascular complications. Cases of scorpion bites maintain their importance because of their higher prevalence especially in Eastern, and Southeastern Anatolia. The objective of this case presentation is to emphasize the fact that myocarditis is a possibility in patients stung by scorpions, and presented with respiratory distress, and a poor general health state

CASE PRESENTATION

A 49-year-old male patient consulted to the emergency service with complaints of shortness of breath with increasing severity lasting for 6 hours after he was stung by a scorpion from his left wrist. His medical history was unremarkable except for type 2 diabetes mellitus, and smoking. Orthopneic patient was firstly evaluated in the emergency service. His blood pressure was 240/110 mm Hg, and heart rate 120 bpm. Besides, crepitant rales were heard up to the upper zones of both lungs. In the emergency service 40 mg furosemide through intravenous route was given, and the patient with manifestations of acute pulmonary edema was hospitalized in the coronary intensive care unit. On his electrocardiogram (EKG) peaked T waves were detected in anterior leads. (Figure 1). His transthoracic echocardiographic (TEE) examination disclosed diffuse impairment of the left ventricular systolic contractility with left

ventricular ejection fraction less than 25 percent. (Video 1*, Video 2*) The patient was started on aspirin, low-molecular weight heparin, nitroglycerine, furosemide, and spironolactone therapy considering initial diagnoses of acute coronary syndrome, and acute myocarditis. Besides, anti-scorpion venom serum, and to counteract allergic reactions intravenous steroids, and antihistaminic therapy were administered. Increased white blood cell counts ($15,000/\text{mm}^3$), hyperglycemia (391 mg/dL), and higher levels of LDL cholesterol (168 mg/dl), HbA1c (5.8%), CKMB mass concentration (21.1 ng/ml), and troponin I (4.87 ng/mL) were detected.

Glycemic control was achieved with insulin infusions. During monitorization, troponin I level peaked (7.05 ng/mL) at 36. hour, and tended to decrease thereafter. On admission, blood creatinine level was 1.2 mg/dL which climbed to 1.9 mg/dL at 36.hours, and then regressed. Creatinine clearance was 63.19 ml/min. The patient with a history of smoking, and diabetes mellitus, and increased troponin I values underwent coronary angiography which demonstrated atherosclerotic plaques responsible for non-critical luminal stenosis. TTE performed on the second day of hospitalization displayed a marked improvement in the left ventricular ejection fraction (45 %). (Video 3*, Video 4*). A rapidly improving acute myocarditis related to scorpion sting was presumed. Regular follow-up was recommended for the clinically stabilized patient to counteract the risk of development of cardiomyopathy, and aspirin, ramipril, carvedilol, and statin therapy was prescribed to be continued after his discharge from the hospital.



DISCUSSION

In most of the patients stung by scorpions insignificant clinical findings are detected, whereas, in some cases fatal cardiopulmonary complications might develop. Asymptomatic, and also severely symptomatic cases with myocarditis who rapidly improved with medical therapy have been cited in the literature [1]

Scorpion venom is a neurotoxin which contains hemolysin, agglutinin, hemorrhagin, leukocytolysine, coaguline, ferments, lecithine, and cholesteroline.[2] Its toxin has both local, and systemic effects. Its local effects include edema, ecchymosis, and burning pain. Its systemic effects are exerted via autonomic nervous system. Scorpion venom toxins stimulate peripheral sympathetic nerve endings leading to catecholamine discharge from adrenal medulla. Thereafter, toxin stimulates alpha receptors which trigger autonomic storm. Scorpion sting leads to autonomic hyperactivity which involves

more predominantly sympathetic tract. In the early stage, hypertension, and left ventricular hypercontractility secondary to increased catecholamine discharge occur. However, in the long run catecholamine depletion syndrome, activation of quinine /prostaglandin pathway, biventricular systolic dysfunction more severely involving the left ventricle, hypotension, pulmonary edema, and cardiogenic shock develop.[3] Hypertensive, and tachycardic manifestations of our patient on admission suggested early stage of the poisoning. Early onset of therapy might contribute to the control of acute heart failure with medical therapy in the short term

The most frequent causes of death following scorpion stings are cardiovascular complications. Increased catecholaminergic activity, decreased myocardial perfusion related to microvascular spasm, and direct impact of venom toxin on myocardial fibriles have

been held responsible for the emergence of cardiovascular manifestations.[4,5]

Although, EKG findings related to the scorpion sting might occasionally suggest myocardial infarction, they are usually nonspecific. Diaz et al.[6] detected alterations in EKG tracings in people stung by scorpions, and reported atrial tachycardia as the most frequently seen type of cardiac arrhythmias. As one literature report indicated, supraventricular arrhythmia developed in a patient with acutely severe myocarditis was kept under control in a short time with beta-blocker therapy. Meki et al.[7] investigated the correlation between troponin levels, and clinical course of the disease, and suggested that myocarditis progressed more severely in those with troponin levels above 4.73 ± 0.76 mg/dL. Higher troponin levels, and detection of severe left ventricular heart failure in the present case, substantiate this finding.

In patients presented with scorpion sting wounds, first of all respiratory support should be provided, and scorpion venom antiserum should be administered. In patients with shortness of breath or deteriorated general health state, EKGs should be obtained, TTEs should be performed, and cardiac enzymes should be controlled. Improvement of fluid-electrolyte balance, and treatment of the heart failure (if present) should be planned. Since narcotic analgesics such as morphine increase frequency of arrhythmic episodes in synergism with scorpion venom, they are not recommended in patients who developed pulmonary edema. Alpha- adrenergic blockers as prazosin can reportedly prevent myocardial damage induced by increased levels of catecholamines during the acute phase.[8] In the majority of patients, clinical symptoms regress within a few days with medical treatment.

In India, Das et al.[9] followed up 32 pediatric cases consulted to them after exposure to scorpion sting, and detected evidence of myocarditis in half of the cases including 4 patients with subclinical progression. In the same investigation, EKG changes detected in 63 % of the cases were reported as sensitive indicators of myocarditis. Left ventricular dysfunction revealed on transthoracic echocardiograms in 69 % of the patients who developed myocarditis, apparently improved during the follow-up period.

Most of the patients recover clinically in a short time after a scorpion sting. However, Sundararaman et al.[10] revealed that scorpion sting is a risk factor for the development of idiopathic dilated cardiomyopathy in the long run. Even if the patients seem to recover after exposure to scorpion sting, subclinical deleterious effects sustain leading to the development of cardiomyopathy in the long term. Even though, manifestations of acute myocarditis, and severe heart failure of our patient were kept under control and his echocardiographic abnormalities improved within 24 hours with medical therapy, we still recommended regular follow-up .

Scorpion sting can result in death because of cardiovascular toxicity of its venom. Possibility of myocardial infarction should be kept in mind in order not to overlook its potential complications especially in patients presented with shortness of breath, and deteriorated general health state.

* Video files are available in the internet address of the article

Conflict of interest: None declared

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Key words: Scorpions; cardiomyopathy, dilated/etiology; myocarditis/diagnosis/etiology; ventricular dysfunction, left/diagnosis.

Anahtar sözcükler: Akrepler; kardiyomiyopati, dilate/etioloji; miyokardit/tanı/etioloji; ventrikül fonksiyon bozukluğu, sol/tanı.