

## Case Report

### Corresponding author

**Irena Çeko Marko, MSc, MD**  
Addictology and Clinical Toxicology  
Service, UHC "Mother Theresa"  
Rruga e Dibrës, 372  
Tirana, Albania  
Tel. 00355 684722796  
Fax: 00355 4 2363644/2362627  
E-mail: [irenaceko@yahoo.com](mailto:irenaceko@yahoo.com)

Volume 2 : Issue 1

Article Ref. #: 1000TFMOJ2112

### Article History

Received: January 6<sup>th</sup>, 2017

Accepted: March 20<sup>th</sup>, 2017

Published: March 21<sup>st</sup>, 2017

### Citation

Marko IÇ, Gjiçali E, Marko S, Alimehmeti I, Sulaj Z. Acute myocarditis: A rare complication after black widow spider bite. *Toxicol Forensic Med Open J.* 2017; 2(1): 12-16. doi: [10.17140/TFMOJ-2-111](https://doi.org/10.17140/TFMOJ-2-111)

### Copyright

©2017 Marko IÇ. This is an open access article distributed under the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

# Acute Myocarditis: A Rare Complication after Black Widow Spider Bite

**Irena Çeko Marko, MSc, MD<sup>1</sup>; Enkeleida Gjiçali, MSc, MD<sup>2</sup>; Sonil Marko, MSc, MD<sup>3</sup>; Ilir Alimehmeti, MSc, MD, PhD<sup>4</sup>; Zihni Sulaj, MSc, MD, PhD<sup>5</sup>**

<sup>1</sup>Addictology and Clinical Toxicology Service, UHC "Mother Theresa", Rruga e Dibrës, 372, Tirana, Albania

<sup>2</sup>Cardiology Service, UHC "Mother Theresa", Rruga e Dibrës, 372, Tirana, Albania

<sup>3</sup>Institute of Health Insurance, Tirana, Albania

<sup>4</sup>Department of Family and Occupation Health, Faculty of Medicine, University of Medicine, Tirana, Albania

<sup>5</sup>Chief of Addictology and Clinical Toxicology Service, UHC "Mother Theresa", Rruga e Dibrës, 372, Tirana, Albania; Clinical Toxicology Lecture, Department of Chirurgical, Faculty of Medicine, University of Medicine, Tirana, Albania

## ABSTRACT

Black widow spider bite can be a rare condition causing various symptoms from mild to very dramatic ones. In this article, we describe the case of a young girl bitten by a black spider whose evaluation was complicated by fulminant myocarditis, fortunately with a good prognosis. Our case study brings light to the various effects that toxins released from the black widow spider can have on the body, especially on the heart. Myocarditis can be one such clinical complication caused due to the effect of the toxic agent on the heart muscle.

**KEYWORDS:** Black widow spider; Myocarditis; Troponin level; Toxin.

**ABBREVIATIONS:** AST: Aspartate aminotransferase; ALT: Alanine aminotransferase; INR: International Normalized Ratio; ECG: Electrocardiogram.

## INTRODUCTION

Black widow spider is a rare type of spider that lives in moderate climatic conditions and is found in the rural area. *Latrodectus Treddecimguttatus*, sometimes known as the Mediterranean black widow, the European widow spider, or the steppe spider, is a species belonging to the genus *Latrodectus*. It is commonly found throughout the Mediterranean region.<sup>1</sup>

Widow spiders are shy and nocturnal. They usually bite when their web is disturbed or upon inadvertent exposure to shoes or clothing.<sup>2</sup>

In Albania, poisoning due to the bite of this specific type of spider was first observed in the early 19<sup>th</sup> century. The first reported cases of patients experiencing acute poisoning due to the bite of this spider were restricted to a limited area in the country including the western lowlands specifically the Kavaja, Durrës and Myzeqe areas. The cases of poisonous spider bites were more often reported from the month of July to September. The period over which the cases of spider bites were reported, was related to the life cycle of the spider and the increased human agricultural activities during this period resulting in a greater contact with the external environment. The map indicating the distribution of affected patients extended across the northern and southern regions of the country during the upcoming years, but was predominant in the plain and hilly areas. The natural origin of this causative organism is attributed to the transportation of the spider from the neighboring countries together with various goods, especially with vehicle tires.<sup>3</sup>



**Table 1:** Hematological and Biochemical Recordings of the Patient from Day 1 to Day 8.

Hospital day	Normal range	Day 1	Day 2	Day 3	Day 4	Day 5	Day 8
White Blood Cell ( $\times 10^3/\text{mm}^3$ )	4.0-10.0		31.8	27.7	17.2	12.8	7.3
Red Cell ( $\times 10^3/\text{mm}^3$ )	4.20-6.10	4.15	4.78	4.75	4.18	4.25	5.29
Hemoglobin (g/dL)	13.8	11.6	13.8	13.9	12.3	12.9	14.1
Hematocrit (%)	35.0-50.0		45	44.8	39.6	38.1	42.3
Platelet ( $\times 10^3/\text{mm}^3$ )	150-390	361	275	267	237	243	257
Glucose level (mg/dL)	74-106	110	103	164	121	110	114
Urea (mg/dL)		28	27	28	30	38	35
Creatinine (mg/dL)	0.6-1.4	0.8	0.6	0.7	0.6	0.7	0.7
Aspartate aminotransferase (U/l)	0-35	13	75	82	71	51	42
Alanine aminotransferase (U/l)	0-45	21	22	24	23	21	22
Lactate dehydrogenase (U/l)	125-250		426				
Creatine kinase (U/l)	0-171		286				142
Creatine kinase-MB fraction	0-24		110				36
Total Bilirubin (mg/dL)	0.3-1.2	0.78	0.6	0.6	0.6	0.9	0.4
Total Protein (mg/dL)	6.2-8.3		6.7	6.4	6.1	6.6	
Sodium (mmol/L)	136-146		132	137			
Potassium (mmol/L)	3.5-5.1		3.6	3.9			
Chloride (mmol/L)	98-106		95	97			
Troponin I (ng/mL)	0,000-1,00		31.3	23		3.9	0.841
INR	0.720-1.200		1.339		1.339	1.386	1.154

AST: Aspartate aminotransferase; ALT: Alanine aminotransferase; INR: International Normalized Ratio.

Electrocardiography results implicated modifications that mimic anteroseptal infarction and transitory changes of the repolarization phase. The electrocardiographic recordings of the patient showed a normal sinus rhythm, normal QRS axis, cardiac frequency of about 90 beats/minute, qS V1,V2,V3, subdenivelation of ST segment 2-3 mm V2,V3,V4,V5,V6 (Figure 1).

Echocardiography results showed a normal left ventricle, modification in the segmental kinetics, hypokinesia of the medial and basal segments of the anterior wall.

The medical condition of the patient improved following the administration of diuretics, anti-inflammatory corticosteroids, analgesic opioid drugs, electrolytes, intravenous perfusions, vitamins, antibiotics, hypnotic sedatives drugs and gastric protections. The normal troponin level was established six days following the spider bite (Figures 2 and 3).

The patient was dismissed from the hospital after 10 days. The patient underwent routine checkup and echography conducted by the cardiologist.

**DISCUSSION**

Firstly, we discuss the kind of insect that bit the patient and its medical implications in the patient. Addressing this particular

aspect of the study, we possess a clear anamnesis suggesting that the poisoning results from the black widow spider bite. In this particular case, the patient’s condition has been treated in the clinical context but the question arises as to whether the use of anti-venom could reduce pain and suffering, shorten the duration of envenomation, and reduce or eliminate the need for hospitalization.<sup>5</sup>

We strongly suspect that myocarditis was caused by the toxins and with the treatment of the clinical symptoms, the condition was reversed. The electrocardiogram (ECG) recordings signify the need of a differential diagnosis for the ischemic conditions of the heart, such as myocardial infarction or pericarditis. But the medical history of the patient, her young age, the increase in troponin levels and the echocardial findings relevant to her condition indicated impaired functions of the left ventricle function thus, resulting in myocarditis.

The differential diagnosis of myocarditis was suggestive of acute coronary syndrome, congestive heart failure, pulmonary edema and pulmonary embolism. Severe myocarditis in the present study was further complicated by pulmonary edema on account of low cardiac output. Prognosis for acute myocarditis can be accurate depending on the clinical presentation of the left ventricle ejection fraction and the pulmonary artery pressure. Our case study describes the whole chain of events occurring in the affected patient with a favorable diagnosis and cure.

Figure 1: ECG 24 Hours after Spider Bite.

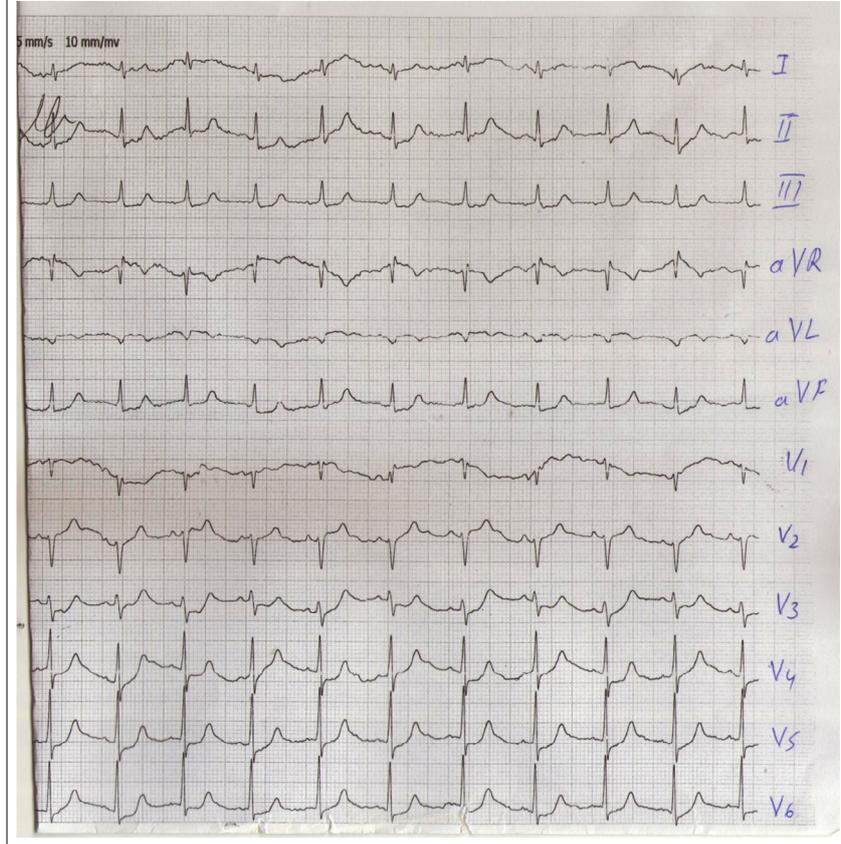


Figure 2: ECG 48 Hours after Spider Bite.

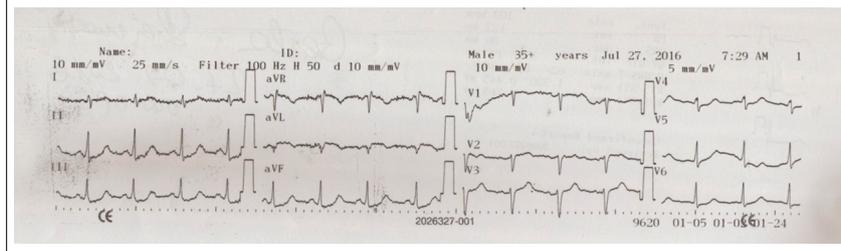
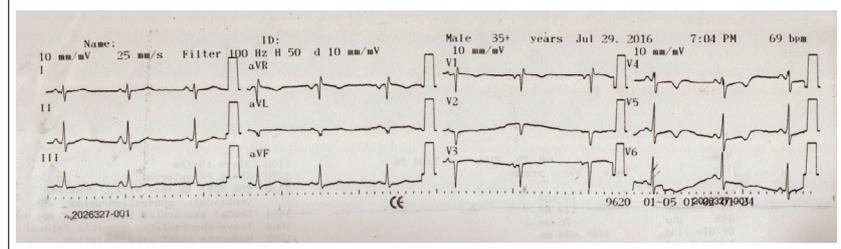


Figure 3: ECG 4 Days after Spider Bite.



**CONCLUSION**

Acute myocarditis can occur very rarely after a spider bite. The ECG changes are a modification of the Quality Real Service (QRS) complex mimicking acute myocardial infarction and transitory changes of the repolarization phase. The elevation of myocardial injury markers [CK-Mb, troponin] as well as echocardiographic findings of segmental hypokinesia and low ejection fraction is compatible with acute/fulminant myocarditis. The aim of the pharmacological treatment of fulminant myocarditis complicated by acute pulmonary edema was to reduce the intensity of symptoms of cardiac insufficiency and neutralize the effects of the toxins released.

**CONFLICTS OF INTEREST**

The authors declare that they have no conflicts of interest.

**REFERENCES**

1. Levy G, Amitai P. Revision of the widow-spider genus *Latrodectus* (Araneae: Theridiidae) in Israel. *Zool J Linn Soc.* 1983; 77(1): 39-63. doi: [10.1111/j.1096-3642.1983.tb01720.x](https://doi.org/10.1111/j.1096-3642.1983.tb01720.x)
2. Nelson SL, Lewin NA, Howland MA, Hoffman RS, Goldfrank LR, Flomenbaum NE. *Goldfrank's Toxicologic Emergencies*. 9<sup>th</sup> ed. New York, USA: McGraw Hill Professional; 2010: 1562-1565.
3. Sulaj Z. *Clinical Toxicology Textbook*. 2013: 536-537.
4. Yaman M, Mete T, Ozer I, Yaman E, Beton O. Reversible Myocarditis and Pericarditis after Black Widow Spider Bite or Kounis Syndrome? *Case Reports in Cardiology*. 2015; 2015: 768089.
5. Hoffman RS, Nelson LS, Howland MA, Lewin NA, Flomenbaum NE, Goldfrank LR. *Goldfrank's Manual of Toxicologic Emergencies*. New York, USA: McGraw Hill Professional; 2007: 912-913
6. Dendane T, Abidi K, Madani N, et al. Reversible myocarditis after black widow spider envenomation. *Case Rep Med*. 2012; 2012: 794540. doi: [10.1155/2012/794540](https://doi.org/10.1155/2012/794540)
7. Sari I, Zengin S, Davutoglu V, Yildirim C, Gunay N. Myocarditis after black widow spider envenomation. *Amer J Emerg Med*. 2008; 26(5): 630.e1-630.e3. doi: [10.1016/j.ajem.2007.09.012](https://doi.org/10.1016/j.ajem.2007.09.012)
8. Kara H, Ak A, Bayir A, Avci A. Reversible myocarditis after spider bite. *BMJ Case Rep*. 2013; 2013: bcr2013008957. doi: [10.1136/bcr-2013-008957](https://doi.org/10.1136/bcr-2013-008957)
9. Malajati H, Bensaad H, Abidi K, Imani F, Gueddari FZ. The contribution of MRI in the diagnosis of acute myocarditis following a spider bite: A case report. *Diagn Interv Imaging*. 2012; 93(11): 887-889. doi: [10.1016/j.diii.2012.06.003](https://doi.org/10.1016/j.diii.2012.06.003)