

Case Reports

Acute Myocardial Infarction in Snake bite Envenomation – A Case Report

NS NEKI¹

Abstract:

Snake bite envenomation is a common problem in tropical countries, especially in rural parts of India. We came across a 30 year old male who presented to the hospital after 4 hours with history of Russell's viper snake bite developing acute non ST elevation myocardial infarction (MI). Myocardial infarction was confirmed by history of left sided chest pain radiating to left arm with diaphoresis and electrocardiographic changes with increased serum troponin levels. Myocardial infarction is a rare complication of snake bite hence case report.

Key words: Snake bite; Myocardial infarction; Russell viper.

Introduction:

In India snake bite and its complications are a common occurrence particularly in rural parts.¹ Though many varieties of snakes are prevalent in most of the states in India, yet morbidity and mortality is mainly due to viper, cobra and krait species. Usually the victims are previously healthy people accidentally bitten by snakes. Viper bite produces severe local reaction with swelling & haemorrhagic manifestation,² unlike nephrotoxicity and neurological complications. Due to its rarity we report a case of acute myocardial infarction complicating snake bite envenomation.

Case report:

A previously healthy 30 year old male farmer by occupation was admitted in hospital with history of snake bite at his left foot while working in the fields. After 4 hours of snake bite, he reached the hospital and the snake was identified as Russell's viper. He developed mild local reaction in the form of erythema surrounding the fang marks. On examination he was comfortable at rest, afebrile with no signs of ptosis or neurological manifestation. Vitals showed pulse rate of 94 per minute and BP 140/90 mmHg, Temperature 98^oF. Cardiovascular and respiratory examinations were normal. Patient was treated with tetanus toxoid and intravenous antibiotics and routine blood investigations were sent. Patient was kept under observation to look for complications of snake bite.

After an hour, patient gave history of left sided chest pain radiating to left arm with profuse sweating. Patient was examined again and ECG showed ST segment depression in anterior chest leads. Laboratory investigations revealed Hb 10.2 gm%, TLC 11300/mm³ DLC P₇₄, L₂₅, E₁, B₀ while blood clotting time was 22 minutes. His physical examination at this time showed profuse sweating with thready pulse of 110 per minute, BP was 90/56 mmHg. Respiratory system examination showed bilateral crepitations. WBCT was prolonged with 22 minutes. Blood investigations revealed positive troponin I, serum bilirubin 1.8 mg%, SGOT 98 u/l, SGPT 68 u/l, blood sugar 120 mg%, urea 28mg% and creatinine 1.0mg/dl. Chest X-ray showed features suggestive of pulmonary edema. Patient was treated with anti snake venom and inotropic agents but despite intensive measures patient died.

Discussion:

As the correct mechanism by which snake bite causes myocardial infarction is not known. The possible mechanisms are, disseminated intravascular coagulation³(DIC) causing thrombus⁴ formation in coronaries and direct vasculitis by snake venom causing infarction. It may also be due to direct cardiotoxic effect⁵ of snake bite. Some snake venoms have sarafotoxins⁶ which cause coronary vasoconstriction. Coronary spasm⁷ due to endothelins released by snake bite is also considered to be a possible mechanism. Although myocardial infarction is not a routine manifestation in Indian Russell's viper snake bite, the treating physician should have high index of suspicion to look for this complication. Due to the rare association of snake bite with myocardial damage this case is being reported.

1. Professor; Dept. of Medicine, Govt. Medical College and Guru Nank Dev Hospital, Amritsar, 143001, India. e-mail : drneki@gmail.com.

Correspondence : Dr. NS Neki. Professor, Dept. of Medicine, Govt. Medical College and Guru Nank Dev Hospital, Amritsar, 143001, India. e-mail : drneki@gmail.com.

This unique case provides evidences for rapid development of ST depression myocardial infarction following a possible intravenous envenoming by a Russell's viper bite. Combined effects of cardiogenic shock due to myocardial infarction, pulmonary oedema & consumption coagulopathy caused death. Although myocardial damage does not seem to be a common feature of Russell's viper bite.

The exact mechanism by which snake bite envenoming leads to myocardial infarction is unclear. Various mechanisms that have been suggested as causative for myocardial infarction following viper bite, are 1. Hypovolemic shock due to bleeding (bleeding due to hemorrhages or toxic vasculitis). 2. Anaphylactic shock. 3. Hypercoagulability in consumption coagulopathy 4. hyperviscosity secondary to hypovolemia induced haemoconcentration. 5. Direct cardiotoxic effect on myocardium 6. Coronary spasms due to endothelins or sarafotoxins or anxiety. Myocardial injury from coronary thrombosis following snake bite is a rare event and should be kept in mind when a patient develops cardiac manifestations following snake bite. Timely recognition and appropriate treatment may be lifesaving.

Tony et al⁸ have reported a case of myocardial infarction on day 2 following snake bite and proposed vasospasm caused by sarafotoxin in snake venom as the possible mechanism. In a study involving 108 patients from Nigeria, more than 60% patients had hemodynamic and electrocardiographic abnormalities.⁹ Dissanayake P et al¹⁰ have described acute MI following Russell's viper bite in a 47 year old man and possibility of predominant coagulant in venom resulting in coronary thrombosis and anaphylactic shock leading to MI were discussed as causes. Aravanis et al¹¹ have reported a case of acute inferior wall MI in a 17 year old girl following viper snake bite. She was treated conservatively. Later she developed stroke which recovered over next two months. The angiogram done at that time showed normal epicardial coronary arteries. They have attributed myocardial infarction to the possible direct cardiotoxicity and also considered coronary thrombosis from hypercoagulability as an alternative mechanism.

Conclusion:

Clinical picture following viper bite is usually characterized by local tissue reaction, haemorrhagic manifestations, nephrotoxicity and neurotoxicity in case of Russell's viper. Myocardial involvement is rare with viper bites and acute

myocardial infarction (MI) caused by viper bite has been reported only a few times. Physicians should bear in mind, the complications and devastating sequel of Myocardial infarction following Russell's viper bite. Pathophysiology of myocardial ischemia in snakebites needs to be explored through careful documentation of clinical condition and thorough investigation of the snakebite victims.

Conflict of interest: None.

References:

1. Kasturiratne A, Wickremasinghe AR, De Silva N, Gunawardena NK, et al. The Global Burden of Snakebite: A Literature Analysis and Modelling Based on Regional Estimates of Envenoming and Deaths. *In* Winkel, Ken. *PloS Medicine* 2008; 5 (11): 218.
2. Murthy JM, Kishore LT, Naidu KS. Cerebral infarction after envenomation by viper. *J Comput Assist Tomogr* 1997; 21:35-7.
3. Ownby CL, Kainer RA, Tu AT. Pathogenesis of hemorrhage induced by rattlesnake venom: an electron microscopic study. *Am J Pathol* 1974; 76: 401-414.
4. Copley AL, Banerjee S, Devi A. Studies of snake venoms on blood coagulation. *Thromb Res* 1973; 2: 487-508.
5. Blondheim DS, Plich M, Borman M, et al. Acute myocardial infarction complicating viper bite. *Am J Cardio* 1996; 78(4): 492-493.
6. Wollberg Z, Bdolah A, Kochva E: Cardiovascular effects of mammalian endothelins and snake venomsarafotoxins. *In* Calcium Channel Modulators in Heart and Smooth Muscle. Edited by Abrahams S, Amitai G. Deerfield Beach, FL: VCH 1990; 283-99.
7. Maheshwari M, Mittal SR: Acute myocardial infarction complicating snake bite. *J Assoc Physicians India* 2004; 52: 63-64.
8. Tony JC, Bhat R. Acute myocardial infarction following snake bite. *Trop Doct* 1995; 3:137.
9. Karaye KM, Mijinyawa MS, Yakasai AM, et al. Cardiac and hemodynamic features following snakebite in Nigeria. *Int J Cardiol* 2012; 156: 326-28.
10. Dissanayake P, Sellahewa KH: Acute myocardial infarction in a patient with Russell's viper bite. *Ceylon Med J* 1996; 41(2): 67-68.
11. Aravanis C, Ioannidis PJ, Ktenas J. Acute myocardial infarction and cerebrovascular accident in a young girl after a viper bite. *Br Heart J* 1982; 47: 500-03.