Case Report

Fatal Anaphylactic Shock Following Scorpion Sting Envenomation

Anand Patil[1a], Vijayakumar Jatti[2b], Shashikala P[2c], DileepKumar R[1d], Pravinkumar NK[1b]

Abstract

Scorpion envenomation is one of the common clinical emergencies in various parts of India especially in rural areas. Mesobuthus tumulus (Indian red scorpion) and Heterometrus swammerdami (Indian black scorpion) are the medically important species. Peripheral parts of the body appears to be the common site for scorpion sting. Venom may be either haemolytic or neurotoxic. Death may occur within hours from pulmonary oedema or cardiac failure. The diagnosis is confirmed by ELISA testing. In present case, a 12years old girl was brought to the SSIMS&RC causality, Davangere, with the history of severe pain and generalized weakness following scorpion sting, and succumbed to death after 40 hours of survival. On autopsy punctured wound mark measuring 0.2 x 0.2 cm in size, was present over the dorsum of the distal phalanx of the left middle finger. Skin sample from the sting site along with vital visceral organs were sent for histo-pathological examination. Gross autopsy and microscopic findings suggested the possibility of death due to anaphylactic shock.

Keywords: *Scorpion Sting; Anaphylaxis; Envenomation; Hemolytic; Neurotoxic*;

Introduction:

Scorpion envenomation represents one of the common clinical emergencies in various parts of India especially in rural areas. Globally, the annual incidence has been estimated at around 1.2 million and Indian records suggest that approximately 10000 people die every year due to scorpion stinging. [1,2]

Most scorpion species are nocturnal in habit. The main toxins include Phospholipase, Acetyl cholinesterase, Hyaluronidase, Serotonin and Neurotoxins. The venom affects sodium channels with prolongation of action potentials, as well as depolarization of nerves of both adrenergic and parasympathetic nerves system. Children under age of 10 years are more likely to develop toxicity from scorpion stings though adults are the common victims. Effects are most severe in infants and toddlers.[3] On autopsy, pulmonary edema was noted in most of the cases of scorpion sting.[4] Here by we report a case of death of a 12 year old girl due to anaphylactic shock following scorpion sting envenomation.

Case Report:

A 12 year old girl came with the alleged history of scorpion sting on her left middle finger, at around 6.00 pm in agricultural field. Following which she was brought to the S.S. hospital, Davangere with the complaints of pain and severe itching over the bite site. On examination she was drowsy, not responding to oral commands but responding to painful stimuli. Pulse was feeble. Blood pressure was 90/60mm Hg, and respiratory rate of 25cpm. She was intubated and was put on ventilator. Inspite

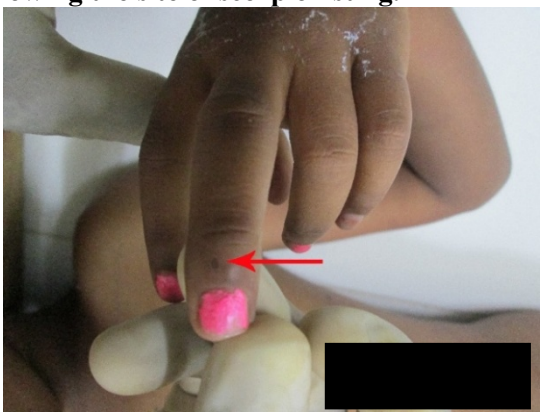
[1a]Assistant Professor, [2b]Professor, [a]Department of Forensic Medicine & Toxicology, Bharathi Vidhya Peeth, University Medical College & Hospital, Sangli, [b]Department of Forensic Medicine & Toxicology, [c]Department of Pathology, SSIMS & RC, Davangere, [d]Department of Forensic Medicine & Toxicology, Sri Siddartha Medical College, Tumukur, Karnataka.
Correspondence:Dr. Anand Patil
Email: anandrockyboy@gmail.com
Mobile no: +918884289388

of all efforts she succumbed to death after 40hours and was shifted to mortuary for autopsy.

Autopsy findings:

On external examination the body was that of a female child, aged about 12 years. Body length 129 cm. Post mortem staining was present over the back and was not fixed. Rigor mortis was present in the head, neck, trunk and proximal parts of the limbs. Lips and nail beds were cyanosed. Punctured wound mark appearing like a scorpion sting measuring 0.2cm x 0.2cm in size, present over the dorsum of the distal phalanx of the left middle finger situated 1cm above the nail bed associated with dark-brown discoloration and swelling of surrounding area measuring 1.5cm x 1cm.

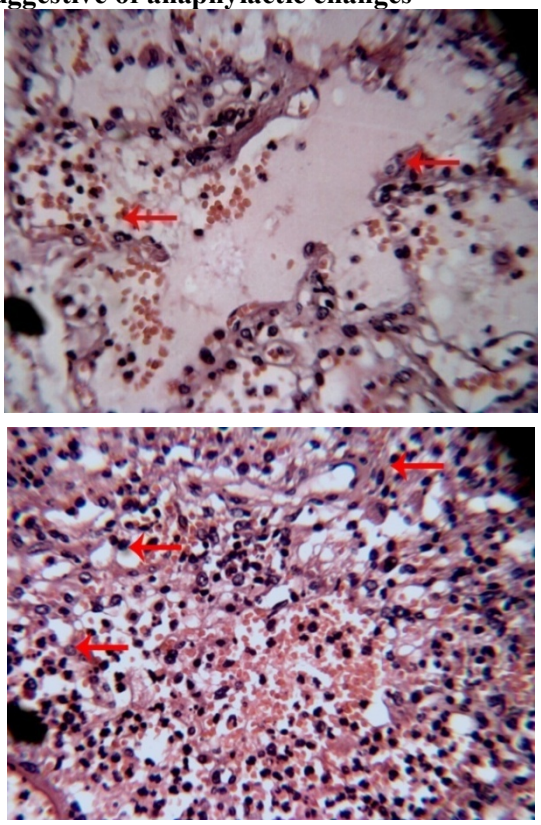
Figure 2. Photograph of the child with skin showing the site of scorpion sting.



Internally all organs were congested and edematous. Both kidneys on cut section showed multiple hemorrhagic spots. Mucosa of stomach also showed hemorrhagic spots at places.

Skin (both test and control sample), lungs, liver, kidneys and heart were sent for histo-pathological examination (HPE). On microscopy skin from the bite site showed thick laminated keratin with unremarkable epidermis and upper dermal congestion. The control skin was histologically normal. Lungs showed edema, hemosiderin laden macrophages with focal destruction of alveoli. Heart showed increased edema of inter myocardial fibers, pericardial edema with mild lymphocytic infiltration. Liver was histologically unremarkable. The microscopic impression of various organs suggested the possibility of anaphylactic shock.

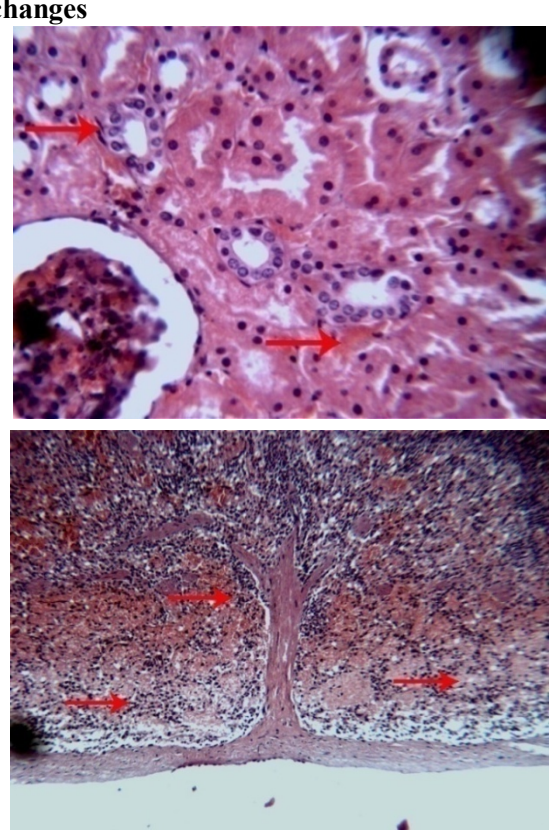
Figure 2. Histo-pathological findings in lungs suggestive of anaphylactic changes



Discussion:

Scorpions are arthropods comprising about 1500 species, of which about 30, belonging to the family Buthidae, are potentially dangerous to humans.[5] The most common scorpion among 86 species found in India is Mesobuthustamulus which is also known as red scorpion. The Indian red scorpion is predominantly present in Rayalseema in Andhra Pradesh, Bellary in Karnataka, Chennai and Madurai in Tamil Nadu, Thane, Raigad, Marathwada of Maharashtra, Puducherry, Saurashtra, Uttar Pradesh and Bihar. The Indian black scorpion is seen in Kerala and Marathwada regions of India. The scorpion has a bulbous enlargement called telson situated at the terminal part of its tail which contains the stinger and venom apparatus.

Figure 3. Histo-pathological findings in kidney and spleen suggestive of anaphylactic changes



Components of scorpion venom are complex and species specific. Scorpion venom contains neurotoxin, hemolysins, agglutinins, leucocytolysins, coagulins, lecithin and chlolesterin.[6] This venom is a species specific complex mixture of short chain neurotoxic proteins, serotonin, hyaluronidase and various enzymes that act on trypsinogen.[7,8] Common sites for scorpion sting are usually the peripheral parts of the body such as hands and foot as in our case the sting mark was present over the dorsum of the distal phalanx of left middle finger. The severity of a scorpion sting mainly depends upon the ratio of the venom to the body weight of the victims. A smaller child, a lower body weight and a larger ratio of venom to body weight lead to a more severe reaction. The role of venom and immune response in triggering the release of inflammatory mediators that are largely mediated by cytokines is being reviewed.[4]Early hospitalization and proper management would decrease the mortality rates due to scorpion envenomation.

Conclusion:

Scorpion envenomation is one of thecommon clinical emergency especially among farmers, farm labourers, and villagers. Deaths due to scorpion envenomation is attributed because of illiteracy, ignorance, poverty, traditional treatment remote areas, and the non-availability of nearby hospital, or at times delay in the appropriate treatment. Areas where prevalence of scorpion sting is more, people should be educated to check for the presence of scorpions in clothing, beddings, and shoes before blindly putting hands into them. The rural people should be advised to wear shoes, especially at night, and to be careful while handling wooden logs, paddy husks etc. Insecticides should be used in inhabited areas.

References:

1. Kumar L, Naik SK, Agarwal SS, Bastia BK. Autopsy Diagnosis of a Death due to Scorpion Stinging – A Case Report. J Forensic Leg Med. 2012; 19:494–6.
2. Chippaux JP, Goyffon M. Epidemiology of Scorpionism: A Global Appraisal. Acta Trop 2008; 107(2):71-9
3. Pillay VV. Modern medical toxicology. 4th ed. 2013. Jaypee publishers; P.160-3.
4. Bardale RV, Dixit PG. Fatal Stings: Autopsy findings in scorpion envenomation. Journal of the Indian Society of Toxicology 2012;8:28-32.
5. Chippaux JP. Emerging Options for the Management of Scorpion Stings. Drug Des Dev Therapy. 2012; 6:165–73.
6. Modi, N.J. Modi's Textbook of Medical Jurisprudence and Toxicology. 24th ed. Bombay, N.M. Tripathi, 1977; p.633.
7. Basu A, Gomes A, Gomes A, Dasgupta SC, Lahiri SC. Histamine, 5-HT &hyaluronidase in the venom of the scorpion Lychaslaevifrons(Pock). Indian J Med Res. 1990; 92:371-3.
8. Jaravine VA, Nolde DE, Reibarkh MJ, Korolkova YV, Kozlov SA, Pluzhnikov KA, Grishin EV, Arseniev AS. Three-dimensional structure of toxin OSK1 from Orthochirusscrobiculosus scorpion venom. Biochemistry 1997; 36:1223-32.