

# Chronic *Mesobuthus gibbosus* scorpionism related to the sting in vein

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**Abstract. – BACKGROUND:** A small amount of data is already presented in the relevant literature related to the medical facts of scorpionism caused by Yellow scorpion (*Mesobuthus gibbosus*: *M. gibbosus*). Undoubtedly, it is considered as dangerous to human health. This paper presents an unusual case of scorpionism after the sting in vein.

**CASE REPORT:** A 25 year old male was bitten by *M. gibbosus*. He experienced extremely severe intermittent pain in the right feet, followed by pulsating and glowing sensations, cold sweat and paleness. 15 minutes after the sting, the pain started to spread through the medial side of the leg, up to the inguinal region. Patient became excited, and experienced occasional spasms of leg muscles. A month after, the bitten vein of dorsal arch of the foot and *v. saphena magna* became non-uniformly tortuously spread through the entire length. On physical examination four years after the sting, the enlargement of the veins still exists, periodical tingling, and occasional muscle twitches during the night.

**CONCLUSIONS:** *M. gibbosus* is endemic in Mediterranean area and represents a real hazard for local inhabitants and tourists. The medical treatment of this type of scorpionism is exclusively symptomatic.

*Key Words:*

Yellow scorpion, *Mesobuthus gibbosus*, Buthidae, Scorpionism, Chronic scorpionism, Phlebitis.

## Introduction

Yellow scorpion (*Mesobuthus gibbosus*, Brulé 1832) lives in Mediterranean region of Europe (Italy, Croatia, Montenegro, Albania, Greece, Cyprus, Turkey, etc) but is found in Bulgaria, Syria and Lebanon<sup>1-3</sup>. It is a very aggressive yellow or yellow-brown scorpion with

thin pliers, the most poisonous in Europe (Figure 1). It can reach up to 85 mm. It is exclusively night-time animal, feeds on insects. Dry and hot areas with sparse vegetation are preferred habitats, like olive groves and beaches. During the day, it is hiding under the rocks or other objects on the ground<sup>2</sup>. Hibernates from September till May<sup>4,5</sup>.

Its poison is neurotoxic, as all poisons of *Buthidae* family representatives. In relevant medical literature, its poison is described as a very dangerous to human health<sup>6-9</sup>. This kind of scorpionism is a significant medical problem in Turkey. Ozkan et al<sup>10</sup> reported a few children deaths.

## Case Report

A 25 year old student, 180 cm height, 110 kg weight, was stung by *M. gibbosus* in June 2008. Suddenly, he experienced extremely severe intermittent pain in the right feet. Patient described the pain stronger than a sting of an angry hornet (*Vespa crabro* Linné), which had sustained two years ago. He was very descriptive: “as someone burns his skin with cigarette-lighter”. The pain became pulsating, very high in intensity, and glowing at the bite site. After a few minutes, a cold sweat covered his body, accompanied with generalized palor. Around the injured site, the skin was blue, and that discoloration lasted for 45 minutes. 15 minutes after the sting, the pain started to spread through the medial side of the leg, up to the inguinal region. 45 minutes after, the pain slightly weakened and localized from the feet to the mid of lower leg.

In first few hours, he became excited, and experienced occasional spasms of leg muscles. In Emergency Service, chlorpiramin hydrochloride



**Figure 1.** *M. gibbosus*. Photo by Jan Ove Rein, The scorpion Files. See Acknowledgement paragraph.

20 mg/2 mL, methylprednisolone 80 mg/2 mL, antitetanus vaccine 40 UI/0.5 ml with antitetanus immunoglobulin 250 UI/2 ml, and diclofenac 75 mg/3 mL were administrated (all intramuscularly), and 500 mL of 5% glucose solution intravenously.

At hospital, laboratory parameters of blood and urine were in normal range, ECG and blood-pressure, too. Surgical evaluation revealed the sting site on the skin just above the vein which belonged to the dorsal venous arch of the foot. Palpation of the injured region provoked the attack of stronger pain. During the hospital treatment, the tingling was constant, while the pain oscillated in intensity, and was depended on analgetics. The useness of single dose of analgesic lasted only one hour. About 10 hours after the sting, he experienced a very hard cramp in the region of *tibialis anterior* muscle. Intramuscularly diazepam (10 mg/2 mL), double dose of diclofenac (75 mg/3 mL), and two doses of metamizol (2.5 g/5 mL) were administrated, followed by two doses of calcium-glubionate (1.375 g/10 mL), and two doses of Ringer solution (500 mL), intravenously.

On second day, the tingling was the dominated symptom in the foot. The laboratory findings revealed slightly increased leukocytes (13.4 g/L), hyperglycemia (8.5 mmol/L), increased creatinine (116  $\mu$ mol/L) with proteinuria. On third day, all parameters returned to normal ranges.

A month after, the sting vein of dorsal arch of the foot and saphena magna vein became non-uniformly tortously spread through the entire length. It was more apparent after the long standing. In addition, he occasionally felt uncomfort-

able burning and tingling sensation along the altered veins, while during the sleep the injured leg unconsciously twitched sometimes. Superficial veins of the left leg are normal. He denied familiar varices cruris. Doppler ultrasonography did not reveal thrombosis, but the thickening of vein wall was present.

On physical examination four years after the bite, the enlargement of the veins still exists, periodical tingling, and occasional muscle twitches during the night. Oedema of the leg was rare and slight.

## Discussion

Scorpionism caused by *Buthida* family members, which includes *M. gibbosus*, is characterized by local and general symptoms. From local, the most common are pain at the stung site which becomes pale or blue, accompanied with hyperesthesia. General symptoms include varieties of neurological, cardiovascular and genitourinary disorders<sup>11</sup>.

According to the recent statistics from Turkey on a large sample, the scorpion stings occur usually in June, July and August, and only sporadically in May and September. The women are usually injured ones (60%). Younger population is mostly affected (15 to 29 year old), followed by the age of 0 to 14. The injection site is usually the upper and lower limbs<sup>9</sup>.

Local symptoms caused by the sting of scorpion *M. gibbosus* and other *Mesobuthus* (*M. eupeusa*, *M. caucasicus*, *M. nigrocinctusa*) are pain, hyperemia, swelling, feeling of burning at the injured site, paresthesia, and itching<sup>9,10</sup>. General symptoms that occur with this scorpionism include dry mouth, thirst, sweating, nausea, dyspnea, cyanosis, increased bronchial secretions, tachypnea, hypotension, hypertension, tachycardia, bradycardia, arrhythmias, muscle contractions, convulsions, pulmonary edema, shock and eventually death due to cardiorespiratory insufficiency<sup>9-12</sup>.

The patient from the case under review here, experienced an extremely strong, searing pain, he sweated copiously throughout the body, became pale, with muscle cramps, and excited. Excitation that accompanies the scorpionism is associated with a particular peptide in the venom with a specific MAO-A inhibitor effect<sup>13</sup>. Affecting the magistral vein, the scorpionism turned to the chronicity, and seems to be com-

pletely unusual presentation. Post-sting phlebitis was observed, four years later still without thrombosis.

From the experience of the Authors of the paper, three other patients who sustained *M. gibbosus* stings were noticed in recent years. The injured sites were lumbal region, big toe, and anterior femoral just above the knee. All of them referred local paresthesia around the site, strong searing pain, numbness, tingling, oedema and erythema of the surrounding skin. Symptomatic therapy was administrated in every case. In one of them, numbness lasted for a month. Comparing the size of the scorpions from these four cases (by the patients' statements), the one from the case under review was the largest (cca 8 cm), and the symptoms was weaker if the scorpion was smaller. It may be related to the amount of toxin which is dependent to the animal size.

*Buthida* scorpionism therapy involves the application of calcium, anti-antihistamine agents, corticosteroids, anti-tetanus protection, and analgesics. Dihydroergotamine may be used. Old guidelines suggest barbiturates, which we believe that are obsolete. Monovalent antiserum should be prescribed if it is available<sup>6,11</sup>. Namely, in *M. gibbosus* scorpionism, specific antiserum type I for *Androctonus crassicaudatus*<sup>14</sup> may be used. Diazepam application is considered to be very useful for calming patients' mental condition and alleviating the muscle cramps which may be painful. In slighter cases of scorpionism, we do not recommend the use of dihydroergotamine and antisera.

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#### Conflict of Interest

The Authors declare that there are no conflicts of interest.

#### References

- 1) FET V, BRAUNWALDER ME. The scorpions (Arachnida: Scorpiones) of the Aegean area: current problems in taxonomy and biogeography. Belg J Zool 2000; 130(suppl): 17-22.
- 2) REIN JO. A review of the scorpion fauna of Europe. Medical Library & Information Center, Norwegian University of Science and Technology. 2013 February [cited 2013 Mar 04] Available from: [http://www.ntnu.no/ub/scorpion-files/european\\_scorp.php](http://www.ntnu.no/ub/scorpion-files/european_scorp.php)
- 3) KALTSAS D, STATHI I, FET V. Scorpions of the eastern Mediterranean. In: Makarov SE, Dimitrijevic RN, Eds. Advances in Arachnology and Developmental Biology, Papers dedicated to Prof. Dr. Bozidar Curcic. Vienna-Belgrade-Sofia: SASA, Belgrade & UNESCO MAB, 2008; pp. 209-246.
- 4) KIZELBACH R. Die Skorpione der Ägäis. Beiträge zur Systematik, Phylogenie und Biogeographie. Zool Jbr Abt Syst 1975; 102: 12-50.
- 5) RADOSAVLJEVIC M, ILIC I. Scorpionism caused by *Mesobuthus gibbosus* in Montenegro – two case reports. Medicina 2009; 45: 196-200.
- 6) MARETIC Z. Our poisonous animals and plants. Zagreb: Stvarnost, 1986; pp. 67-70.
- 7) LEBEZ D, MARETIC Z, LADAVAC J, MEDEN M. *Mesobuthus gibbosus* – A potentially dangerous European scorpion. Proceeding of the 8th International Congress of Arachnology; Vienna, Austria, 1980 July 7-12; pp. 187-190.
- 8) KEEGAN HL. Scorpions of Medical Importance. New York-London: Fitzgerald Publishing, 1980; p. 142.
- 9) OZKAN O, KAT I. *Mesobuthus eupeus* scorpionism in Sanliurfa region of Turkey. J Venom Anim Toxins incl Trop Dis 2005; 11: 479-491.
- 10) OZKAN O, UZUN R, ADIGUZEL S, CESARETLI, ERETEK M. Evaluation of scorpion sting incidence in Turkey. J Venom Anim Toxins incl Trop Dis 2008; 14: 128-140.
- 11) EFRATI P. Epidemiology, Simptomatology and Treatment of Buthinae Sting. In: Bettini S, Ed. Arthropod venoms. Berlin, Heidelberg-New York: Springer Verlag, 1978; pp. 312-317.
- 12) ALTINKAYNAK S, ERTEKIN V, ALP H. Scorpion envenomation in children. Turk Arch Ped 2002; 37: 48-54.
- 13) UÇAR G, TA C, TÜMER A. Monoamine oxidase inhibitory activities of the scorpion *Mesobuthus gibbosus* (Buthidae) venom peptides. Toxicon 2005; 45: 43-52.
- 14) OZKAN O, ADIGUZEL S, KAR S, YAKISTIRAN S, CESARETLI Y, KARAER Z. Determination of potency and paraspecific effects of *Androctonus crassicauda* (Olivier, 1807) antivenom against *Mesobuthus gibbosus* (Brullé, 1832) venom (Scorpiones: Buthidae). J Venom Anim Toxins incl Trop Dis 2007; 13: 500-508.