

*Prikaz bolesnika/
Case reports*

Correspondence to:

Slobodan Boricic, MD

Faculty of Medicine, University of
Montenegro
Ljubljanska b.b.
81000 Podgorica, MONTENEGRO
slobodanboricic@yahoo.com
+382 67 885837

BIOGEOGRAPHY AND CLINICAL REVIEW
OF *MESOBUTHUS GIBBOSUS*
SCORPIONISM IN MONTENEGRO: *Clinical
cases of six patients*

BIOGEOGRAFSKI I KLINIČKI PRIKAZ
MESOBUTHUS GIBBOSUS ŠKORPIONIZMA U
CRNOJ GORI *Klinički prikaz šest pacijenata*

Bogdan Pajović¹, Milovan Radosavljević², Ivana
Radosavljević I³, Marko Vuković¹, Slobodan Boričić¹

¹Faculty of Medicine, University of Montenegro, Podgorica
(Montenegro)

²Department of Surgery; General Hospital, Kotor, (Montenegro)

³Faculty of Science and Mathematics, University of Montenegro,
Podgorica (Montenegro)

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Ključne reči

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Abstract

Aim: Scorpionism caused by *Mesobuthus gibbosus* is considered hazardous to human health. In this report, the cases of six patients are presented with this scorpionism, which occurred in Grbalj, a small geographical area in Montenegro.

Case report: The *Mesobuthus gibbosus* stings occurred during construction work, in two cases, three happened during walking, and in one case, during some work done on the balcony. Out of general symptoms these were observed: excitement, pallor and profuse sweating. Local symptoms were: paresthesia, pulsiraing pain, muscle cramps in legs, bruised skin and skin redness. After three years, one patient had occasional muscle twitching, pain and enlargement of the superficial veins in the stabbed leg. The symptomatic therapy was applied on all six cases and was successful.

Conclusions: *Mesobuthus gibbosus* is endemic to a small geographic area, Grbalj, and poses a threat to the health of the local population and tourists. All cases of the scorpionism formed on the „terra rossa” type of soil. Treatment of scorpionism is symptomatic.

INTRODUCTION

In the area of Montenegro, lives a yellow or yellow-brown, very aggressive scorpion, *Mesobuthus gibbosus* (1, 2). The people who live in Grbalj call it „klijještan” (eng: Pliers). It has thin pliers, and grows 67 to 85 mm. It is a nocturnal animal which feeds on insects. It resides on dry fields, in olive groves, in the hills, in wet woods, even on the beaches, a few meters from the sea. During the day it hides under rocks or other objects on the ground. It hibernates from September to May (3, 4). This species of scorpion lives also in F.Y.R.O.M (Former Yugoslavian Republic of Macedonia) in the place called „Ovcije Polje” (eng: The Field of Sheep) (1). His presence has also been proved in Albania, Bulgaria, Greece,

Cyprus, Turkey, Syria and Lebanon (5, 8). The most toxic is the European scorpion. The poison is exclusively neurotoxic, like poisons of all the representatives of the family Buthidae. Medical literature mentions that this poison is dangerous and hazardous for human health (1,9, 12). This scorpion is a major health problem in Turkey because there are recorded cases of death in children (12).

CASE STUDY

The first patient was a weekend-tourist from Podgorica, 25 years old. On June 9, 2008, around 10am, while he was lubricating the mechanism on the excavator, near the village Krimovica, he was stabbed by a yellow scorpion in the right

foot. The pain was extremely strong, with the characteristic of a burning sensation. The pain continued as a pulsating pain. Cold sweat was pouring down his body, with a marked pallor of the skin. Around the place where he was stabbed by the scorpion the skin was bluish. This bluish color of skin was persisted about 45 minutes. After 15 minutes of the stab, the pain has began to spread through the inside of the leg, up to the groin. The patient was excited the entire time. The first few hours after the stab he had occasional spasms in the muscles of the lower leg. After a few hours, the skin lesions had disappeared. We assume that the place of injection of toxin was a thicker subcutaneous vein which had shined in the most painful area of the skin. The palpation and pressure on the stabbed region provoked the attack of stronger pain. The patient was hospitalized for observation. The pain fluctuated in intensity, depending on the use of analgesics. The next couple of days the patient referred to the pain only as a slight tingle when standing. A month after the scorpionism, he noticed that the subcutaneous vein of the leg, which was stabbed, had spread over his entire length. It became more pronounced when his leg was in a straight-down position. In addition, he occasionally felt an uncomfortable burning sensation along the altered veins. Also, while sleeping, he would feel his other leg twitching. In one year, he lost about 25 kg of body weight. Meanwhile, the subcutaneous veins had become even more pronounced and expanded. Three years after the scorpionism, the patient continues to mention the extension and protrusion of superficial veins, occasional uncomfortable burning sensation and occasional night twitching in the other leg. He denies any familiar history of varicose veins disease. Superficial veins on the other leg are normal. (4,13)

The second patient was a weekend-tourist from Serbia 16 years old. On July 23, 2008, around 11am, while doing some work around the house in the village of Krimovica, he suddenly felt severe pain in his left side of the body, above the hip. He had been stabbed by a yellow scorpion through a cotton T-shirt. Pain on the stabbed side was pulsating, of burning character, medium to high intensity. At that point, bruised skin appeared bruised, with a dimension of 5x7 cm. Within the first hour, occasional radiant paresthesia occurred from a stab wound direct to the groin. After an hour the pain had weakened. At the injection site, we noticed skin edema with erythema, diameter of 1 cm, with a small red dot in the middle. He received only intramuscular diclofenac and diazepam. Skin changes faded and decreased over time, with no residual problems. (4)

The third patient was a 29-year old clerk from Kotor. On August 9, 2010, around 8pm, on the steps of her house, near the village of Bigovo, a yellow scorpion stabbed her. She felt extreme severe pain on the edge of the right big toe. Around 10pm, due to severe pain and mental distress, she had swallowed ibuprofen tablets 400 mg and bromazepam 3mg tablets. Local pain was strong with constant numbness on the edge of the thumb. This was the reason why she asked the surgeon for help. The pain and numbness had disappeared within a few days.

The fourth patient was a farmer from the village Glavati, aged 69. Around 11am, on August 8, 2011, while walking along the side of the agricultural field, was stabbed by a yellow scorpion, in the lateral edge of the left foot. A few hours after the bite, she felt a strong, burning pain that spread through the foot and lower leg. She was admitted into primary care, by her family doctor. She took diclofenac tablets. The pain gradually disappeared in a few days.

The fifth patient was a female tourist from the Russian Federation, 43 years of age. On 6 September 2012, around 10am in the village Glavatičići, at home, on the terrace, while cultivating the flowers, was stabbed by a yellow scorpion with thin pliers. The injection site was above her left knee. She immediately felt a very strong, sharp pain, which spread into the depth of her feet. She was very excited. Immediately after the stab, palm-sized swelling appeared with hardening of the skin and with strong pain on touch. The intumescence had disappeared after 10 minutes, and at the injection site remained the redness with a diameter of about 2 cm. The pain was very strong and it lasted for about two hours. The patient was admitted to the emergency room, where she received intramuscular diclofenac and diazepam, with a complete anti-tetanus protection. After this therapy, the problems quickly disappeared. The day after, the stab wound was observed as deep dark red papules with 2 cm in diameter and with weaker numbness in this region (Figure 1).



Figure 1: Stab wound *Mesobuthus gibbosus* 24 hours after bite. Red spot shows the place of injection of *Mesobuthus gibbosus*.

The sixth patient was a female farmer from the village Glavatičići, 78 years of age. On May 8, 2012, around 12 pm, while she was working in the field, next to village, a yellow scorpion stabbed her in the second finger on the left foot. She felt a very strong, burning pain, which was spreading to the dorsal side of the foot. An hour later, during examination, we found swelling and redness of the skin on the second finger of the dorsal side of feet. She received intravenous metamizole. After monitoring her for a few hours the pain had eased up, but the finger was still swollen and bluish. The problems entirely subsided without treatment for a few days.

DISCUSSION

Scorpionism, which is caused by *Mesobuthus gibbosus*, is associated in literature with the area of the capital city of Montenegro, Podgorica. (1) The first two cases occurred in a

small complex of one hundred meters in the village of Krimovica.⁽⁴⁾ The third patient was stabbed near the village of Bigovo, fourth in the village of Glavati, and the fifth and sixth in the village of Glavatičići. All the sites where the bites occurred belong to the geographic area of Grbalj (Figure 2). This area is part of the Montenegrin coast, located between Tivat bay on the northwest and the bay Jaz and Trsteno in the southeast. The southern part of Grbalj has access to the sea, while the north-east border, which extends from the church „The Holy Trinity” to Spas, make the slopes of Mountain Lovcen. This area covers 97 km² and extends from the coast to about 1,000 meters above sea level. The longitudinal axis of the strikes in the direction NW-SE is 18km in length. Comparing the geographic map (Figure 2) with the map of the Grbalj land, we found that all the bites occurred on the ground of red soil, „crvenica” (terra rossa), more specifically on the subtype of red soil "colluvial rossa". It is the red soil of sinkholes, bays and fields, which is of a homogeneous look and dark red or brick color. The domicile population which lives on the other types of soil in Grbalj claim that this type of yellow scorpion is completely unknown to them, and also scorpionism of this type.

The first two and the fourth female patient with this scorpionism are not local inhabitants, they are tourists. The first patient has a drastic different clinical picture, because he was stabbed directly into a vein of the largest specimen (measured about 7 cm) (Figure 3).



Figure 2. Places where patients were stabbed by a yellow scorpion *Mesobuthus gibbosus*; The red ellipses indicate sites of the village Bigovo, Glavaticici, Krimovica and Glavati.



Figure 3. The scorpions *Mesobuthus gibbosus* that provoked scorpionism. On the left side specimen of *Mesobuthus gibbosus* length about 7,2 cm; on the right side specimen of *Mesobuthus gibbosus* length about 7,5 cm

According to recent statistic results from Turkey, on a large sample, the scorpion stings from genus *Mesobuthus* occur most often in June, then July and August, and only occasionally in May and September. More often, the patients

were woman (60%).⁽¹¹⁾ In our case, women had more frequent scorpionism (Table 1). According to results from the literature, the patient's age is usually between 15 to 29 years, followed by 0 to 14 years and then 30 years and above. The injection site were most common in the upper and lower extremity, trunk and the rarest in the head and neck.⁽¹¹⁾ In our case study, five patients had been stabbed in the lower extremities and one in the trunk (Table 1). Local symptoms in scorpionism caused by the sting of genus *Mesobuthus* (species: *gibbosus*, *eupeusa*, *caucasicus*, *nigrocinctus*) are: pain, hyperemia of the skin, swelling, burning at the injection site, itching and paresthesia.^(11, 12) General symptoms which occur in this scorpionism are: dry mouth, thirst, sweating, nausea, dyspnea, cyanosis, increased bronchial secretion, tachypnea, hypotension, hypertension, tachycardia, bradycardia, arrhythmias, muscle contraction, convulsions, pulmonary edema, shock and at the end death due to cardio-respiratory insufficiency.^(11,12, 14) The first patient beside extremely strong, burning and pulsating pain, had also profuse sweating all over the body, pallor of the skin and cramps in the striated muscles of the affected limb, excitement and bruising of skin at the injection site immediately after the incident. The fifth and sixth patient had local swelling of the skin and subcutaneous tissue. We recorded mental excitement in the first, third and fifth patient. Excitement that accompanies this type of scorpionism is related to the specific peptide in the venom, with a specific inhibition of enzyme MAO-A.⁽¹⁵⁾ All patients report paresthesias locally at the injection site and around the puncture site. Late sequelae of scorpionism after three years are: enlargement and the protrusion of superficial veins, burning sensation during their way in the leg and occasional twitches of muscles in stabbed leg.⁽¹³⁾

Therapy of scorpionism of toxic species of family Buthidae involves the application of: calcium, antihistamines, corticosteroids, barbiturates, anti-tetanus protection, analgesics, dihydroergotamine, monovalent antiserum of toxin of scorpion.⁽¹⁾ In scorpionism caused by *Mesobuthus gibbosus*, besides the antiserum for the specific type of scorpion, antiserum for *Androctonus crassicaudatus* could be given.⁽¹⁶⁾ Application of diazepam, in our opinion, could be very useful for psychological appeasement of the patient and for relief of muscle spasms. We do not recommend the application of dihydroergotamine and antiserum.

CONCLUSION

1. Scorpionism caused by the sting of *Mesobuthus gibbosus* is endemic in Montenegro, only in the area of Grbalj.
2. All cases of scorpionism took place on „terra rossa” types of soil, on the subtype of red soil called „colluvial terra rossa”.
3. All cases of scorpionism were treated with analgesics and benzodiazepines
4. Only one case resulted in chronic scorpionism, with expansion of subcutaneous veins of the leg.
5. Scorpionism caused by the sting of *Mesobuthus gibbosus* represents a health threat for the local population and tourists.

Table 1 : Display of stiches *Mesobuthus gibbosus* in Grbalj, Montenegro

Date	Time (0-24h)	Location	Age	Gender	Occupation	The place of injection	General symptoms	Local symptoms	Consequence
09.06. 2008.	10.00	Krimovica	25	M	Tourist	Foot	Yes	Yes	Ahered veins
23.06. 2008.	11.00	Krimovica	16	M	Tourist	Trunk (above the hip)	No	Yes	No
09.08. 2010.	20.00	Bigova	29	F	Clerk	Foot	Yes	Yes	No
08.08. 2011.	11.00	Glavani	69	F	Farmer	Foot	No	Yes	No
06.09. 2012.	10.00	Glavatičići	43	F	Tourist	Thigh	Yes	Yes	No
08.05. 2013.	12.00	Glavatičići	78	F	Farmer	Foot	No	Yes	No

Sažetak

Cilj: Škorpionizam koji izaziva *Mesobuthus gibbosus* smatra se opasnim za ljudsko zdravlje. U ovom radu prikazani su slučajevi šest bolesnika s ovim škorpionizmom koji su nastali na geografski malom području, Grblju u Crnoj Gori.

Prikazi slučajeva: Ubodi *Mesobuthus gibbosus* u dva slučaja nastali su pri građevinskim radovima, kod tri slučaja su nastali pri šetnji, a u jednom slučaju na terasi kuće pri njezi cvijeća. Od opštih simptoma primijećeni su: uzbuđenost, bljedilo čitave kože, profuzno znojenje. Lokalni simptomi bili su: parestezije, pulsirajući bolovi, grčevi mišića nogu, modrilo i crvenilo kože. Nakon tri godine jedan pacijent je imao povremene trzaje mišića, bol i proširenje površne vene na ubodenoj nozi. Primijenjena je simptomatska terapija u svih šest slučajeva i bila je uspješna.

Zaključak: *Mesobuthus gibbosus* je endemičan na malom geografskom području-Grbalj, te predstavlja opasnost za zdravlje lokalnog stanovništva i turista. Svi slučajevi škorpionizma nastali su na vrsti tla „terra rossa“. Liječenje ovog škorpionizma isključivo je simptomatsko.

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