

PRESENTACIÓN DE CASOS

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On the unusual hemorrhagic and necrotic activities caused by the rattlesnake (*Crotalus durissus cumanensis*) in a Venezuelan patient

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SUMMARY

The hemorrhagic, necrotic and edematous effects observed in a 23-year-old patient from Lagunetica, Los Teques, state of Miranda, Venezuela, that was bitten by a common Venezuelan rattlesnake (*Crotalus durissus cumanensis*), were described. The patient was treated with polyvalente serum, antibiotics and autograft. This finding allows to suggest that the poison of some Venezuelan common rattlesnakes has a systemic effect on the skeletal muscle and on capillaries that generate edema, hemorrhagic phenomena and necrosis

Subject headings: SNAKE VENOMS; HEMORRAGE; CROTALID VENOMS; NECROSIS; EDEMA; MUSCULOSKELETAL SYSTEM; CAPILLARIES.

In Central and North America bites by crotalid snakes such as rattlesnakes result in local tissue damage including myonecrosis, oedema, inflammation and haemorrhage. After specific treatment the patients survive the snakebite, but might suffer vast local tissue damage that could result in deterioration and dysfunction of the extremities. South American rattlesnakes are not usually hemorrhagic. In Venezuela, human accidents caused by rattlesnakes (*Crotalus durissus cumanensis*) bites are of major significance because they may cause severe envenomation, which can lead to death.^{1,2} The venom of *Crotalus durissus cumanensis* has a powerful neurotoxic activity.³ Patients habitually present respiratory paralysis and could develop renal alterations caused by myoglobin deposit in

the proximal tubules or by direct effect of venom on kidney.⁴ The venom has been clinically described as showing low proteolytic activity, and causing minor oedema at the bite site.^{5,6} There are only a few reports^{7,8} in the literature about effects of South American *Crotalus* venom on local tissue, especially clinical studies. In this work an unusual clinical case of an evident hemorrhagic and necrotic activities in a patient bitten by South American *Crotalus durissus cumanensis* rattlesnake is described.

CLINICAL RECORDS

Case report and results. 23 years old patient, masculine, from Lagunetica, via Agua Fría, Los

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Teques, Miranda state, Venezuela who referred the beginning of his clinical symptoms after a rattlesnake (*Crotalus durissus cumanensis*) bite in the third finger of his right hand was studied and treated at the emergency unit of the Victorino Santaella Hospital, Los Teques, Venezuela. The patient referred local pain immediately after the bite, non irradiated, of median intensity, and with concomitant oedema of the hand without other general symptoms. As important personal antecedents, he referred a *Bothrops* snake bite in 1990. The physical examination showed a blood pressure of 120/70, and the cardiac and respiratory frequencies of 80 and 18 per minute. A marked increase in volume of the right hand and forearm, with a reddish and hot oedema were observed. Laboratory tests were conducted (table). Twenty-four hours after the bite, the patient still presented bleeding, necrosis and cyanosis of the dorsal face and cubital border of the finger. The Toxicology Service suggested the injection of a second five ampoules series of antiserum and a strict observation of the patient alertness. The patient evolution after five ampoules of polyvalent antivenin injection, at arrival, produced a transient exacerbation of local symptoms, accompanied by dyspnoea and drowsiness. The inflammatory process improved with the administration of a non-steroidal anti-inflammatory agent (ketoprofen), antibiotics (prostagilin, 2 g every 4 h/7 d), at day 4 a necrectomy and auto-graft were carried out. After 5 d an improvement of the graft and the inflammatory process was observed. The patient

left the hospital with antibiotic therapy (clindamicin, 600 mg every 6 h/ 10 d).

DISCUSSION

In Venezuela, the pathogenesis of tissue damage in viperid envenoming has been specifically studied in relation to systemic alterations.⁹⁻¹² In South America there are not many reports in the literature about the effect of venom on local skeletal muscles and haemostatic function. Some authors described^{13,14} that local muscular lesions are common in Viperidae envenoming. Some studies have shown that skeletal muscle function can be affected in different manners by total venom toxins and venom fractions.¹¹ Experiments using *Crotalus* venom hemorrhagic fractions have shown that they are capable of causing haemorrhage, and myonecrosis secondary to haemorrhage.¹⁰ The patient's haematological evaluation showed no anaemia and moderate leukocytosis. The evaluation of levels of PT and PTT in plasma showed alterations on the first day of envenoming and later recovering of normal values.

No major alterations were observed in urea and creatinine. Platelet levels were low on day 0 and later days increased near normal values after specific treatment (table). Hand oedema was characterized by a thickening of the subcutaneous and/or muscular cellular tissue, haemorrhage was seen as light red bands on large areas of skin, muscular and perimuscular tissues. In the

TABLE. Laboratory tests

Day 0

WBC mm ³	S (%)	L (%)	E (%)	P mm ³	Hb g/100 mL	Hct %	F mg/100 mL	PT sec.	PTT sec.	U mg/100 mL	C mg/100 mL
11 100	84	14	2	57 000	15.3	46.7	160	93	100	18	.82

Day 2

WBC mm ³	S (%)	L (%)	E (%)	P mm ³	Hb g/100 mL	Hct %	F mg/100 mL	PT sec.	PTT sec.	U mg/100 mL	C mg/100 mL
9 000	80	18	2	125 000	14.0	45.0	250	13	25	22	.72

WBC: White blood cells, S: Segmented, L: Lymphocytes, E: Eosinophils, P: Platelets, Hb: Haemoglobin, Hct: Haematocrite, F: Fibrinogen, PT: Prothrombin time (control for prothrombin time was 13 ± 1 seconds), PTT: Partial thromboplastin time (control for PTT was 22.5 ± 1 seconds), U: Urea, C: Creatinine.

subcutaneous tissue, haemorrhage was seen as a generally small liquid accumulation and bleeding from the wound. The muscular lesions were accompanied by lesion in the subcutaneous tissue. Our observation about recurrent local and coagulopathic effects (worsening after clinical improvement) after treatment with Fab antivenin for envenomation in North American Crotalinae snakes have been described by other authors.¹⁵ Recurrence is coherent with known venom and antivenin kinetics and dynamics. The clinical significance of late coagulopathy after snakebite is uncertain, but clinically important bleeding is a probability. Prevention and treatment of recurrence with Fab antiserum need repeated dosing for at least 24 h, with close monitoring of at-risk patients in the follow-up period. Duration of therapy depends on individual risk factors and haemostatic function.⁴

Snake venom contains toxins, which may be involved in the destruction of proteins within the tissues. Most toxins in viperid snake are hemorrhagic fractions which cause the destruction of the basement membrane and capillary extracellular matrix. Virtually all of the hemorrhagic toxins that have been isolated and characterized have been determined to be metalloproteinases.¹⁰ The existence of venom proteins that directly damage the blood vessel wall in *Crotalus durissus cumanensis* may be the major cause of bleeding and experimental research need to be done to describe these venom proteins which cause direct damage to the vessel wall or act by hypoxia phenomena.

RESUMEN

Se describieron los efectos hemorrágico, necrótico y edematoso en un paciente de 23 años, proveniente de Lagunetica, Los Teques, estado Miranda, Venezuela, ocasionados por la mordedura de una serpiente cascabel común venezolana (*Crotalus durissus cumanensis*). El paciente recibió tratamiento con suero polivalente, antibióticos y un autoinjerto. Este hallazgo, permite sugerir que el veneno de algunas serpientes cascabeles comunes en Venezuela, poseen un efecto sistémico sobre el músculo esquelético, y también efectos sobre capilares que generan edema, fenómenos hemorrágicos y necrosis.

DeCS: VENENOS DE SERPIENTES; HEMORRAGIA; VENENOS CROTALIDOS; NECROSIS; EDEMA; SISTEMA MUSCULOESQUELETICO; CAPILARES.

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