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## A rare cause of cellulitis (necrotic arachnidism): a report of two cases

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## ABSTRACT

Bites from brown recluse spiders (*Loxosceles reclusa*) result in several clinical manifestations, causing painful, disfiguring necrotic ulcers and, uncommonly, severe systemic effects. We report two cases reports with necrotic arachnidism from Turkey. A 21-year-old man was admitted to our clinic with the complaints of pruritis, redness on his neck. He had a history of spider bite one day ago. A 52-year-old woman had a cellulitis with hemorrhagic lesion and superficial necrosis on her arm and had a history of spider bite one day ago. Based on these clinical and epidemiological findings, a diagnosis of necrotic arachnidism was suspected, and the diagnosis of necrotic arachnidism was confirmed with these typical skin lesions and spiders bites in histories of patients. The outcome of our patients were good after antihistaminic, antibiotic, analgesic and anti-inflammatory treatments. The brown recluse spider is notorious for its necrosis-inducing bite. Its venom contains a rare toxin, sphingomyelinase D, which activates the vascular endothelium and initiates a cascade of activation of neutrophils and granulocyte macrophage colony-stimulating factor, resulting in tissue destruction. In many cases, diagnosis of spider bite is very difficult. Therefore, clinical and epidemiological findings, as well as a detailed history, may establish the diagnosis.

## 1. Introduction

Spider bite is common, but most spider bite is minor and causes nothing more than local irritation. Bites from brown recluse spiders (*Loxosceles reclusa*) result in several clinical manifestations, they possess a venom capable of causing painful, disfiguring necrotic ulcers and, uncommonly, severe systemic effects<sup>[1–3]</sup>.

The diagnosis of a spider bite is typically made on historical and epidemiological findings, clinical signs and symptoms, and the morphologic appearance of the cutaneous lesion. Thus, diagnosis is rarely based on the identification of the spider<sup>[1,3–5]</sup>.

We report two cases reports with cellulitis (necrotic arachnidism) from Turkey.

## 2. Case report

A 21-year-old man was living in Buldan in western Turkey. He was admitted to our clinic with the complaints of pruritis, redness and a sensation of mild swelling on his neck. He had a history of spider bite one day ago. His complaints had started after the spider bite and pruritis, swelling, pain, redness were added subsequently. At initial presentation his general condition was average, and he exhibited full consciousness, orientation and cooperation. His body temperature was 36.8 °C, pulse 78 beats/min. Any abnormality was not noted on systemic examination except cellulitis with hemorrhagic lesion and superficial necrosis (Figure 1). An initial laboratory evaluation revealed: white blood cell count 8 300/μL, hemoglobin 13.4 g/dL and platelets 282 000/μL. The laboratory tests, including liver and renal function tests, urinalysis, serum electrolytes, and coagulation functions, were all within normal limits.

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**Figure 1.** A patient with cellulitis (hemorrhagic lesion and superficial necrosis) on his neck.

A 52-year-old woman living in Buldan in western Turkey had a cellulitis on her arm and had a history of spider bite one day ago. She felt a slight pain in her arm during the night while folding her arm. At initial presentation her general condition was average, and she exhibited full consciousness, orientation and cooperation. Her body temperature was 36.4 °C, pulse 80 beats/min. Any abnormality was not noted on systemic examination except cellulitis with hemorrhagic lesion and superficial necrosis (Figure 2). An initial laboratory evaluation revealed: white blood cell count 7400/ $\mu$ L, hemoglobin 12.6 g/dL and platelets 234000/ $\mu$ L. The laboratory tests, including liver and renal function tests, urinalysis, serum electrolytes, and coagulation functions, were all within normal limits.



**Figure 2.** A patient with cellulitis (hemorrhagic lesion and superficial necrosis) on her arm.

Based on these clinical and epidemiological findings, a diagnosis of necrotic arachnidism was suspected, and the diagnosis of necrotic arachnidism was confirmed with these typical skin lesions and spiders bites in histories of patients.

We thought that clinical signs were as an envenomation by a *Loxosceles* sp. spiders. Microscopic examination of the materials scraped from beneath the edge of the eschar revealed no Gram-positive rods, fungal infection or cutaneous leishmaniasis.

The patients lesions were washed with soap and water, and a cold compress were applied. The outcome of our patients were good after antihistaminic, analgesic and anti-inflammatory treatment. Sulbactam–ampicillin treatment were started because of secondary bacterial infection suspected and tetanus vaccines were applied.

In addition, the first patient's lesion was disappeared after 5 d and second patient's lesion was disappeared after 15 d antibiotics treatment combined with antihistaminic, analgesic treatment.

### 3. Discussion

Spider bites are common in many parts of the world. However, most domestic spiders are not substantially venomous to humans[6]. The brown recluse spider is notorious for its necrosis, inducing bite. Its venom contains a rare toxin, sphingomyelinase D, which activates the vascular endothelium and initiates a cascade of activation of neutrophils via E-selectin, interleukin-8, and granulocyte macrophage colony-stimulating factor, resulting in tissue destruction[7]. Although rare, systemic reactions to the venom may include fever, leukocytosis, maculopapular rash, hemolytic anemia, disseminated intravascular coagulation, and hematuria[1,8,9]. McDade *et al.* recently reported six adolescents with acute hemolytic anemia from presumed brown recluse spider bites[10]. Our patients were developed cellulitis an early hemorrhagic lesion with superficial necrosis. The diagnosis of spider bite is very difficult, and obtaining a detailed history and observation of systemic and local findings are helpful in the diagnosis and treatment[11]. The diagnosis in previous reports was made clinically, based on a combination of history, signs and morphologic appearance of the dermal lesion[12–14]. Infections with herpes zoster virus, herpes simplex virus, and Panton–Valentine toxin-positive *Staphylococcus aureus* can be misdiagnosed as necrotic arachnidism[15]. Dermonecrotic lesions, such as bacterial or fungal infections, Lyme disease (erythema migrans), cutaneous anthrax and leishmaniasis, may be considered in the differential diagnosis[16].

Nevertheless, the characteristic red, white, and blue sign visible for the first few days has been associated with loxoscelism. This sign is a consequence of erythema, ischemia, and thrombosis observed from the periphery to the center of the lesion[17]. *Loxosceles rufescens* was suspected because it is endemic to Mediterranean regions[18].

The venom provided supporting evidence for the diagnosis. *Loxosceles* venom may be detected by a sensitive and specific ELISA, using specimens obtained noninvasively by swabbing the lesions with cotton gauze for diagnostic confirmation[11,19,20]. Definitive diagnosis is usually not possible because laboratory venom analysis is not routinely used.

The diagnosis of our cases were made according to the

report of patients and clinical and historical findings, signs, and symptoms.

Optimal treatment for necrotic spider bites is not well defined. Pressure is applied to the proximal side of the bite site, the area is washed with soap and water, and a cold compress is applied. Antibiotic cream can be used, or ammonia or vinegar<sup>[21]</sup>. The bite site is elevated, and the patient is instructed to rest. Aspirin, antihistamines or a tetanus vaccine may be used in cases involving itching and erythema, etc. Antibiotic can be used for cellulitis prophylaxis. Dapsone is useful for severe cutaneous reactions such as necrosis or edema. Systemic symptoms can be treated with supportive therapy. Systemic steroids can be used to prevent renal failure and to stop hemolysis<sup>[5]</sup>.

Some researchers have suggested hyperbaric oxygen, local nitroglycerine and cyproheptadine as an alternative to surgery in cases of dermonecrotic lesions<sup>[22,23]</sup>.

Surgical repair may be necessary in severe cases of ulcerative lesions, but should not be initiated until the primary necrotizing process is completed<sup>[1,24]</sup>.

Our patients were treated with systemic antibiotics, antihistaminic and analgic treatment. No surgical excision was required following treatment.

#### 4. Conclusion

In conclusion, spider bite is common in our country. In many cases, diagnosis of spider bite is very difficult. Therefore, clinical and epidemiological findings, as well as a detailed history, may establish the diagnosis.

#### Conflict of interest statement

We declare that we have no conflict of interest.

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