

***Loxosceles* SPIDER BITE IN TURKEY (*Loxosceles rufescens*, SICARIIDAE,
ARANEAE)**

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ABSTRACT: Loxoscelism is caused by envenomation by spiders that belong to the *Loxosceles* genus. In loxoscelism, a local necrotic lesion appears and, in many cases, loxoscelism or necrotic araneism is considered a serious public health problem. There is no diagnostic test available to help the physician make a diagnostic or therapeutic decision. Here, we report the case of a severe dermonecrotic araneism (loxoscelism) in Turkey probably due to the bite of *Loxosceles rufescens*. There was little erythema at the beginning, followed by severe necrosis after 20 days, and skin grafting was needed although the case was treated.

KEY WORDS: spider bite, loxoscelism, skin grafting, *Loxosceles rufescens*, Turkey.

CONFLICTS OF INTEREST: There is no conflict.

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INTRODUCTION

Nearly 40,000 species of spiders have been described worldwide; however, approximately 200 species are actually considered dangerous to humans (12). The known most dangerous spiders belong to the following genera: *Latrodectus* (black widow spiders, Theridiidae), *Steatoda* (false widow spiders, Theridiidae), *Loxosceles* (recluse spiders, Sicariidae), *Atrax* (funnelweb spiders, Hexathelidae), *Phoneutria* (banana spiders, Ctenidae), *Cheiracanthium* (foliage spiders, Miturgidae) (9).

Like other venoms, spider venoms are pharmacologically very active in the animal kingdom and contain heterogeneous substances, such as proteins, peptides, polyamines, bioamines, free acids, glucose, free amino acids, inorganic ions and salts, and are species-specific (17). In spiders, the venom can be divided into two major groups according to its effect: neurotoxins and necrotoxins. Neurotoxins affecting both insect and mammalian nervous systems are a constituent of the venom. Since many spiders catch and paralyze insects, which are their usual prey, they are expected to possess neuroactive substances in their venoms. Necrotoxins are defined as toxins that induce tissue necrosis at the envenomation area.

Necrotic araneism caused by a spider is described as a local necrotic lesion and is considered a serious public health problem. There is no diagnostic test available to help the physician make a diagnostic or therapeutic decision. Besides, most physicians are unfamiliar with spiders and spider bites. These lesions are necrotic ulceration and extensive tissue damage with cell death. The activity of hydrolytic enzymes of sphingomyelinase-D found and identified in the venom of *Loxosceles reclusa* is the responsible agent for hemorrhagic and necrotic lesions (21, 23). The bite of *Loxosceles* spiders is the cause of dermonecrotic lesions, loxoscelism named as necrotic araneism. Systemic loxoscelism is a condition that is characterized by one or more of the following: nausea, vomiting, chills, fever, myalgia, generalized purpuric rash, hemolytic anemia, acute renal failure, shock, coma, and death. This severe subset of clinical presentations is more common in children, possibly due to a greater dose of venom per kilogram of body weight, compared to adults (18).

A lot of studies were carried out on the identification and purification of the venom content in *Loxosceles* species in the North, Middle and South America (6, 11, 20). Envenomation by the bite of *L. reclusa* in North America, by the bites of *L. seri* and *L. sonora* in Mexico, and by the bites of *L. intermedia*, *L. gaucho* and, most rarely, *L.*

laeta in Brazil is a common health problem and there are also a lot of case reports about envenomation by *Loxosceles* species (4, 5, 15, 16).

The Mediterranean recluse spider, *Loxosceles rufescens* (Dufour, 1820), originated in the Mediterranean region of North Africa and Europe. It is distributed in France, Portugal, Spain, Italy, Greece, and Crete, from Morocco to Egypt, Israel, Palestine, Jordan and Lebanon (1, 7, 8, 10, 13, 22, 24). In Turkey, *L. rufescens* was recorded in Nusaybin (Mardin), Elbistan (Kahramanmaras), Dortyol (Hatay), Kemer (Antalya), Datca (Mugla), Didim (Aydın) and Kabatas (Istanbul). However, there are very limited publications on envenomation by *L. rufescens* in Turkey (3, 14) and the adjacent countries. Stefanidou *et al.* (22) studied 13 envenomation cases in warm periods in Greece. Amr (1) and Wong *et al.* (25) recorded some *Loxosceles* envenomation cases in Jordan and Palestine. Also, Efrati (13) submitted a case report with regard to *L. rufescens* in Israel.

In the present paper, a case, which we presumed to be due to the bite of *L. rufescens* and which started with little erythema, then progressed to severe necrosis within 20 days, requiring skin grafting although the patient was treated, was evaluated in the light of literature.

CASE REPORT

We report the history of a woman (25-year-old) with severe necrosis due to a spider bite. On July 25, 2005, she was sitting on the set near her office in Kabatas Set, Istanbul. She was wearing slippers. She felt a pain like a mosquito bite on the inner side of her left foot, but she did not consider it important. Perhaps she was unaware that she had been bitten. Two hours later, she noticed the redness (erythema) on her left foot and felt mild pain. Then, she went to the hospital (Figure 1). There was a 4X8cm erythematous plaque on the inner part of her left foot at initial examination.

The patient received the therapy: antihistamine, analgesia and antibiotic. One day later, severe pain begun, and the erythematous rash got larger. The patient again went to the hospital and was prescribed an antihistamine cream. Two days later, the patient complained of an increasing pain. The purpuric erythema and edema extended from the left foot and leg to the groin; the whole leg was swollen. The purpuric erythema changed the serious wound, the area of demonecrosis extended to 3X5cm. The lesion on the tenth day was a clear marmoreal plaque, the characteristic clinical presentation of loxoscelism (Figure 2).

She could not walk or stand. The necrotic superficial dermal tissue was debrided by the cream which she used for therapy. The wound exhibited purulent material (Figure 3); she underwent surgical wound debriment and the wound was cleaned with sterile, regular dressing changes. The skin ulceration and eschar formation occurred two weeks after the bite.

The wound was diagnosed as necrosis by the physicians, and a repair surgery (skin grafting) was suggested. Fifty-two days after the bite, the 3X5cm necrotic eschar with surrounding erythema was cleaned, and skin grafting was performed using some skin removed from the groin (Figure 4). A week after the operation, the wound started healing and the pain decreased (Figure 5). Five months after the envenomation, the wound healed leaving a scar (Figure 6).



Figure 1. The patient presented erythema and edema. (a) Left foot (dorsal part or left side of the bitten area) while she went to the hospital. (b) Three days after the bite.

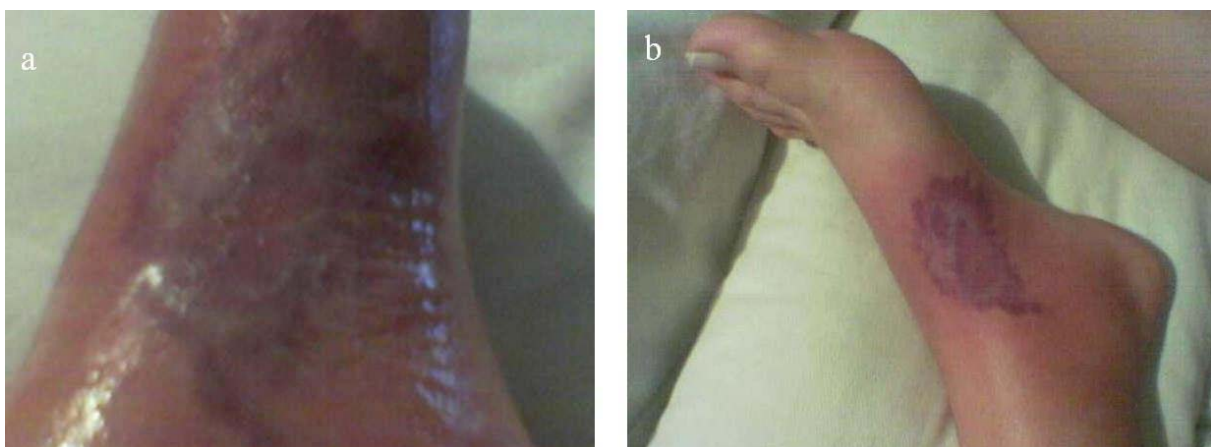


Figure 2. The wound caused by the spider bite on the seventh (a) and tenth (b) day after the bite.

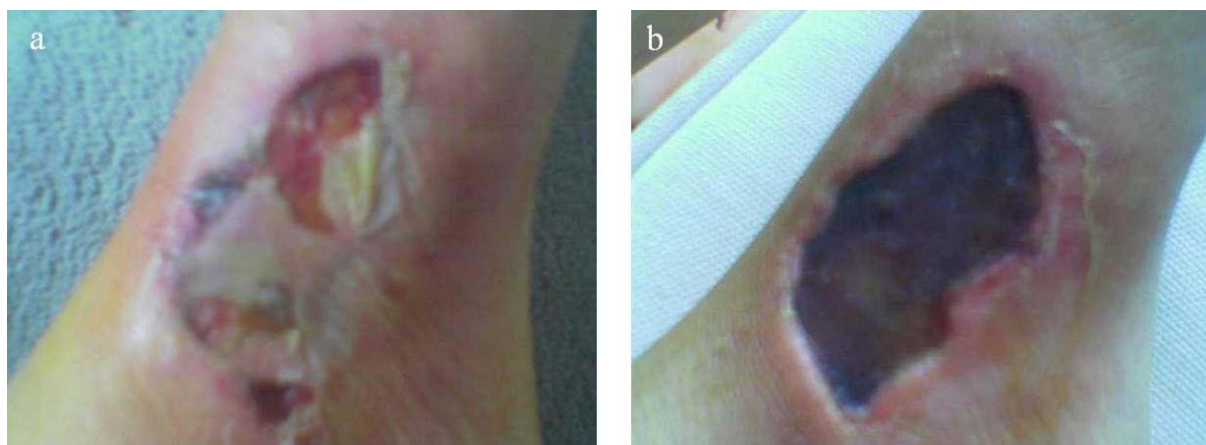


Figure 3. The necrotic superficial dermal tissue was debrided, the wound exhibited purulent material (a) and formation of the necrosis (b).



Figure 4. The operation before (3 days) the skin graft.



Figure 5. The operation after (10 days) the skin grafting.



Figure 6. Healing wound after five months, there was a scar.

DISCUSSION

Loxosceles spider bite is a well documented dermonecrotic lesion in human. This study described a probable case of loxoscelism from Istanbul, Turkey. The diagnosis of loxoscelism is clinically based on the complete history, physical examination, and laboratory studies. Unfortunately, there is no readily available diagnostic test for loxoscelism or *Loxosceles* envenomation. Diagnosis of loxoscelism is rarely based on the identification of the spider. Unless the patient brings the preserved spider, the

diagnosis is only presumptive, based solely on clinical signs and symptoms. However, most physicians are unfamiliar with spiders and spider bites. Therefore, it is difficult to let the diagnostic or therapeutic decision for the physician. Physicians cannot recognize the bites without the specimen. In these cases, bites by spiders, other arachnids and insects can be confused. For instance, according to Russell and Gertsch (19), from 600 suspected spider bites with local signs and symptoms, recorded by them, 80% were by other arthropods (tics, bed bugs, fleas, etc.). On the other hand, the spider fauna of Turkey is not well known. So, it is quite possible to confuse the bites by spiders and insects. Nevertheless, spider bites have been reported with increasing frequency in many countries.

The members of the genus *Loxosceles* belong to the family Sicariidae, and there is only one species of native *Loxosceles* spider in Turkey. *Loxosceles rufescens* was recorded at a few localities in Turkey. Atila *et al.* (3) reported the first case from Turkey of a dermonecrotic wound associated with possible *Loxosceles* spider bite and offered the complete clinical course in a permanent scar. Another loxoscelism case was represented from Turkey by Kose *et al.* (14) in another study. A few cases which involved bites by *Loxosceles* spiders have been reported from Turkey in recent years (3, 14). We considered that loxoscelism is a serious public health problem in the region where *Loxosceles* spiders are commonly distributed and transported to other regions. It can be possible to encounter some spider species in the natural distribution area other than our country and which are transported by ships and with some other goods that are being transported. For this reason, cases involving bites by *Loxosceles* spiders, whose natural distribution area is not Turkey, are seen at an increasing frequency.

The recluse spider bite is characterized by dermonecrosis and systemic effects known as loxoscelism. Some local and systemic noxious activities of the spider venom are attributed to proteolytic toxins that degrade fibrinogen, fibronectin, entactin and heparin sulphate proteoglycan and disrupt basement membrane structures, thereby causing local hemorrhage, disseminated intravascular coagulation and renal failure (2). The activity of sphingomyelinase-D found in the venom of *Loxosceles* spiders is the responsible agent for hemorrhagic and necrotic lesions (21, 23). In the present case report, the lesion on the tenth day was a clear marmoreal plaque and constitutes the characteristic clinical presentation of loxoscelism. This is a good sign for the report and is important for the description of

the case because there is no laboratorial or serologic tests for the diagnosis, but the clinical manifestations are very typical.

The severity of the reaction caused by a spider bite is related to the amount of injected venom; bite site, the victims' age, and the injection of gastric contents with the bite. Treatment of *Loxosceles* spider bites includes steroids, dapsones, antibiotics, conservative wound management, hyperbaric oxygen therapy, and scar reconstruction (18). However, none of these treatments have been proven to be effective in the healing of humans.

In conclusion, loxoscelism produces highly suggestive signs and symptoms, but every patient should be asked about the bite history. Even if the spider is not captured, physicians must be able to identify spider bites and should consider the etiology of *Loxosceles* spiders, according to the clinical and epidemiological findings.

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