

Morbidity of Brown Recluse Spider Bites

Clinical Picture, Treatment and Prognosis

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A retrospective review was made of 35 cases of Brown Recluse spider bites treated during a period of 21 years. The most common location of the bite was on the lower limbs, particularly the thigh. The main systemic manifestations were fever, malaise and maculopapular rash, but there were no cases of hemolysis, coagulopathy, or of renal or neurologic involvement. Signs indicating a poor prognosis appeared to be lymphangitis, generalized maculopapular rash and location of the bite on the thigh or abdomen. Most cases were treated effectively by rest, elevation of the affected part of the body, local cleansing, and prophylactic antibiotics. On the basis of this experience it was concluded that only when lesions show a necrotic area measuring 2 to 3 cm should patients be treated with systemic corticosteroids. In most such cases, administration of corticosteroids for 14–21 days proved sufficient to avoid the need for surgery. Only 5 cases required surgical intervention.

(Accepted November 19, 1990.)

Acta Derm Venereol (Stockh) 1991; 71: 337–340.

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The Brown Recluse spider (*Loxosceles reclusa*) (Fig. 1) is one of nineteen different species belonging to the genus *Loxosceles* (1) and is the most frequent species encountered in North America. In Israel and the Mediterranean basin its counterpart is *Loxosceles rufescens* (2, 3), the venom of which is identical to that of *Loxosceles reclusa*.

Although many spider bites evidently occur without attracting the victim's attention (4–5) a notable number do produce local and systemic reactions. The local reaction, or necrotic arachnidism, is usually manifested within 2–8 h by the development of erythema, swelling and local itching. During the next 24–48 h a blue-grey halo will form around the red centre (Fig. 2) and this will be followed within 7–10 days by blistering, ischemia and eschar formation (Fig. 3). After the eschar has been shed there

remains an ulcer that sometimes requires skin grafting (2, 3). The possible systemic reactions cover a wide spectrum, which includes fever, malaise, vomiting, urticaria and other generalized rashes, hemolysis, coagulopathy, jaundice, renal failure, transverse myelitis and shock (1, 6, 7).

There is wide disagreement as to the most effective local treatment. Some authors support a conservative approach consisting of local cleansing of the affected area, prophylactic systemic antibiotics, antipyretics (1, 2, 4), or even the systemic administration of corticosteroids within the first 24–72 h after the bite, or of dapsone. Others recommend surgical debridement within 10 days of the bite (11). There is greater consensus as to the treatment of the systemic manifestations. Systemic corticosteroids are beneficial in preventing or lessening systemic hemolysis (11, 12) and heparin may prevent renal failure secondary to the coagulopathy and disseminated intravascular coagulation induced by the venom.

Since there are no practical diagnostic tests available (13, 14) we undertook a retrospective study of patients diagnosed to have suffered BR spider bite, in an attempt to characterize the early appearance of lesions which should arouse suspicion of such a bite, to examine the accompanying systemic effects and to evaluate the different therapeutic approaches and their efficacy.

PATIENTS AND METHODS

A retrospective review was made of the records of 35 patients (17 males, 18 females); age range 9–80 years, (mean 47 years) who had been hospitalized at our medical centre with the diagnosis of BR spider bite between January 1968 and January 1989. Data were collected based on the following parameters: season in which bite occurred, site of bite, victim's awareness of the sting, presenting symptoms, time elapsed until hospitalization, appearance of lesion upon admission, systemic effects of bite, treatment administered and course.

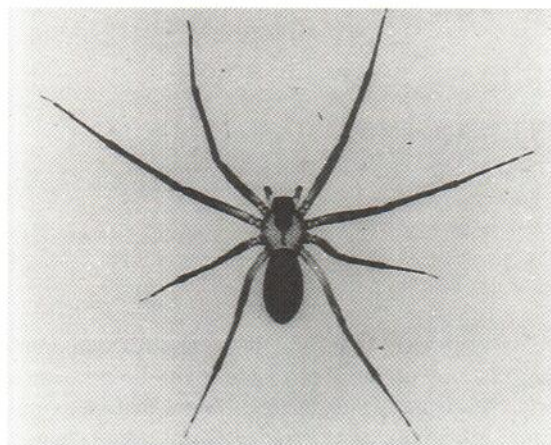


Fig. 1. Brown Recluse spider (*Loxosceles reclusa*).

The patient's condition on admission was evaluated in accordance with the Auer Classification (12), as follows:

- Grade 1: mild local erythema at puncture site
- Grade 2a: necrotic area less than 1 cm in diam.
- Grade 2b: lesion as in 2a accompanied by mild systemic reaction, e.g. nausea and low fever
- Grade 3: necrosis measuring 1–4 cm, accompanied by moderate systemic reaction, e.g. chills, fever, arthralgia, petechiae and generalized rash
- Grade 4a: necrosis measuring more than 4 cm, accompanied by coagulopathy, severe hemolysis and hemoglobinuria
- Grade 4b: findings as in 4a, plus renal failure, secondary infection and shock.

RESULTS

Clinical evaluation

43% of the bites occurred during the summer months (June–August), 31.5% during spring and 20% in the autumn, with only 2 cases in the winter months.

In 19 patients (54%) the site of the bite was on a lower limb, particularly the thigh, whereas in 8 patients (22.5%) it was on an upper limb, in 3 (8.6%) on the abdomen, in 3 (8.6%) on the chest and in 2 (5.7%) on the neck. In no case was the site on the buttocks, an area commonly involved. Only 18 (51.4%) patients had been aware of the sting.

The presenting symptom most frequently reported was either local tenderness with an erythematous macule, or sharp local pain. Some patients had more than one presenting symptom. In one-fifth the presenting sign was a local blister noticed by the patient. The interval between appearance of the first symptom and hospitalization was less than 24 h for 5

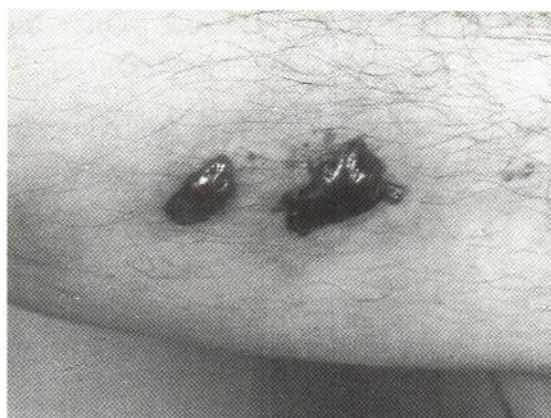


Fig. 2. Typical Brown Recluse spider bite on the arm, 48 h after the bite.

patients (14.3%), within 3 days for 12 (34.3%), between the 3rd and 7th days for 11 (31.4%) and more than a week for 7 (20%).

The lesion (or lesions) observed on admission included an erythematous and edematous area in more than two-thirds, a dark blue or black lesion in more than half, and a serous or hemorrhagic blister in rather fewer than one-half. Lymphangitis was seen in one patient admitted 5 days after the first symptom and there was regional lymphadenopathy in 6 patients, all of whom had moderately severe lesions, in 4 located on the thigh. According to the Auer Classification, 4 patients were grade 1, 4 grade 2a, 10 grade 2b, 16 grade 3 and one grade 4. They were graded in accordance with the extent of local necrosis, even when the systemic manifestations were milder than those given in Auer's classification. Most bites were moderately severe (grades 2b, 3). Of 19



Fig. 3. A necrotic lesion 7 days after the spider bite.

Table I. Generalized dermatologic features in 35 patients with brown spider bite.

	No.	(%)
Maculopapular rash	11	(31.4)
Purpura	5	(14.3)
Urticaria	3	(8.6)
Pruritus	3	(8.6)
Palpebral puffiness	2	(5.7)
Pustular eruption	1	(2.9)

bites on the lower limbs, 14 (73.7%) were moderately severe, as were all three bites on the abdomen.

The most frequent systemic symptom was fever, found in slightly more than half of the patients, followed by malaise, registered in about a fourth of the cases. Other recorded symptoms were chills (in 5 cases), nausea or vomiting (4 cases) and tachycardia or mild ECG changes (in 2) as well as abdominal pain, chest pain and elevation of blood pressure in one case each. In 25 patients there were generalized dermatologic features (Table I), the most common of which was maculopapular rash. Of the 11 patients with the latter, only one patient was grade 4a and the rest were grade 3 or 2b. The most frequent laboratory abnormalities were leukocytosis (in 17 cases) and an accelerated ESR (in 13 cases); also found in individual cases were the following: lymphocytosis, eosinophilia, leukopenia, decreased hemoglobin, reticulocytosis, thrombocytopenia and elevated gammaglobulin. No patients showed evidence of hemolysis, coagulopathy, hemoglobinuria or renal dysfunction.

Therapy

All patients were initially treated by local cleansing and cooling of the area with local application of antibiotics and, as appropriate, elevation of the affected limb.

Thirty patients received only conservative treatment. Of these, 17 (56.7%) received combined treatment with antibiotics (erythromycin tablets, 2 g/d) and corticosteroids (Prednisone tablets, 30–60 mg/d for 10–14 days). Six patients (20%) were effectively treated with only systemic antibiotics, and 5 (16.7%) with only systemic corticosteroids; 2 received only systemic antihistamines or analgesics. Surgical treatment was necessary in only 5 patients, all of whom had severe local lesions. Three of the 4 patients with grade 3 lesions had not received sys-

temic corticosteroids and required debridement and primary closure or skin grafting. The one patient with grade 3 who had received corticosteroids required only debridement. Of the 2 patients requiring skin grafting, the one with a grade 3 lesion had received systemic antibiotics for 24 days. The other was hospitalized 9 days after appearance of the presenting sign due to persistent high fever, malaise and a maculopapular rash, with the additional finding of leukocytosis, an accelerated ESR, reticulocytosis and decreased hemoglobin values; the grade 4a lesion required both debridement and skin grafting despite 21 days of systemic treatment with antibiotics and corticosteroids.

DISCUSSION

From the number of cases collected in our series it would appear that BR spider bites are more frequently encountered than was previously believed. Many of the characteristics of the patients in our series are similar to those reported previously for cases of BR spider bites: most patients fell within an age range from 20 to 60 years, the sex distribution was equal, and most bites occurred during seasons of outdoor activity and the active phase of the life cycle of spiders, i.e. the summer months, but also during the spring and autumn (2, 3, 12). The location of bites was most frequent on the lower limbs (2) but in no case on the buttocks, thought to be a classic site for spider bite. It is of interest that half of the victims felt the sting, in contrast to the belief that most bites go unnoticed until the appearance of a local lesion (2, 3).

As might have been expected, most of the manifestations registered for the cases reviewed in our retrospective study were moderate to severe, since all of these patients had required hospitalization. However, the systemic symptoms encountered were not severe, the most common being fever, malaise and chills, with only one patient who had suffered abdominal pain. The only significant laboratory abnormalities were accelerated ESR and leukocytosis with a leftward shift. There was no evidence of frank hemolysis, hemoglobinuria, coagulopathy or renal disturbance in any of these patients. It was of particular interest to find, in contrast to previous reports (1, 12), that there was no apparent correlation between the appearance of the local lesion and the systemic influence exerted, since in some cases serious local lesions were almost devoid of serious sys-

temic manifestations whereas in others a mild local lesion was accompanied by severe systemic symptoms.

It was observed that lesions located in areas with abundant adipose tissue, such as the thigh or abdomen, appeared to be more severe, which is in accordance with the proposed mechanism of the venom (14, 15). These lesions were often accompanied by lymphangitis or lymphadenitis or by generalized maculopapular rash. In most cases, conservative management, i.e. elevation of the injured part of the body, local cleansing, antipyretics and prophylactic antibiotics, achieves satisfactory results. Lesions with a necrotic area of 2–3 cm should be given systemic corticosteroids in addition. This approach appeared to lessen the need for later surgical intervention. It was found that this conservative approach applied for 14 to 21 days was often sufficient and it is advised that debridement or other surgical procedures be postponed until this interval has elapsed.

One of the problems encountered in determining the therapeutic approach is the fact that in its early stage the lesion resulting from BR spider bite does not present clearly defined pathognomonic clues to the correct diagnosis but may be mistaken for physical injury, cellulitis, vasculitis or other insect or snake bite. The subsequent course is, however, highly typical and we feel clearly indicates the occurrence of spider bite.

Thus the sudden appearance of a solitary painful or itching erythematous lesion, particularly on the lower limbs, should arouse the suspicion of BR spider bite. The diagnosis will be confirmed when local discoloration or darkening suggesting necrosis, or a serous or hemorrhagic blister appears within 24–48 h.

The possibility of scorpion and snake bite will be excluded by the lack of severe systemic symptoms and the difference in the local clinical picture (snake bite can be excluded by the lack of abdominal pain and priapism). The natural history of the lesion and

the generally good prognosis are also important clues in making the correct diagnosis.

In conclusion, we should like to stress the importance of an awareness of the possible occurrence of Brown Recluse spider bite and the lesion in which it may result. We should also like to emphasize that adequate conservative measures will in most cases be effective in achieving satisfactory healing, without the need for surgical intervention.

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