Case-based review

“Bug Bite”: a case series of 11 patients referred to a single plastic surgeon

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Summary

Brown recluse spiders have long been blamed as the cause of an acute-onset dermatonecrotic ulcerative lesion. However, research over the past fifteen years has vehemently refuted that notion and have concluded that the number of brown recluse spider bite diagnoses far exceeds the number of actual such bites. What is difficult about this problem is that the other causes of dermatonecrotic ulcerations are so rare and present with systemic symptoms, meaning that most of these “brown recluse spider bites” must actually be idiopathic acute-onset dermatonecrotic ulcerative lesions. Here, we present a case series of 11 patients referred to a single plastic surgeon in the month of July who presented with acute-onset dermatonecrotic ulcerative lesions and thinking that they were bitten by a spider. Our goal in presenting this series, as well as reviewing the literature on brown recluse spider bites, is not to refute the fact that brown recluse spider bites are the cause of such lesions but to heighten awareness of a seemingly consistent clinical presentation and course. Because such lesions do not resolve with antibiotics or conservative therapy alone, we present this case series to demonstrate that early recognition and referral for proper wound debridement and management is critical for optimal prognosis.

KEY WORDS: spider bite; brown recluse spider; dermatonecrotic lesion; dermatonecrotic ulcer.

Introduction

Spiders have frequently been blamed as the cause of an acute presentation of a dermatonecrotic ulcerative lesion. In particular, the brown recluse (Loxosceles reclusa) has become particularly well-known because its toxin contains hyaluronidase and sphingomyelinase, which can cause tissue necrosis (1, 2). The typical “brown recluse spider bite” patient often describes waking up with a small bump, red mark, or bite mark that progressively increases in size, soreness or pain, redness, and swelling with later development of a necrotic core (3-6). Very few patients report seeing the spider bite them, let alone bring the spider in to confirm its species and instead are empirically diagnosed with a brown recluse spider bite (1, 2, 7-10).

However, a strong effort by physicians who are experts on spider and other arthropod bites has vehemently rejected the notion that brown recluse spiders are causing these lesions (1, 2, 7-18). They argue that spiders, by nature, are not aggressive and will not attack unless provoked and should thus always be found in one’s close proximity. Furthermore, physicians have reported brown recluse spider bites across the country, but the spiders have definitively been found only in a few states in the southern and central U.S. (7). Several studies have demonstrated that the number of diagnoses of spider bites far exceeds the actual number of brown recluse spiders (8-10). These experts found that patients initially diagnosed with brown recluse spider bites were later diagnosed with a variety of other medical conditions that also cause dermatonecrotic lesions, including various bacterial, fungal, or viral infections, vasculitides, other autoimmune disorders, other acquired dermatologic conditions, etc. (7, 10).

Here, we present a series of 11 patients who were referred to our practice by primary care or emergency medicine providers with acute-onset dermatonecrotic ulcerative lesions. All 11 patients described stories very similar to the classic “brown recluse spider bite” and had similar appearing skin lesions. All 11 patients were initially treated with antibiotics – by either their PCP, the ED, or a dermatologist – without resolution of their symptoms. Debridement, wound care, and antibiotics resulted in complete wound healing in all patients. Our goal in presenting this series certainly is not to question the well-supported notion that brown recluse spiders are not the cause but to raise awareness of a surprisingly consistent clinical presentation.
and course that can be managed effectively with early referral to plastic surgery for proper wound debridement and care.

**Case series**

**Patient CL**

CL is a 65-year-old male who states “a spider bites me” 7 days prior to presentation. He was admitted to the hospital 5 days prior to presentation for a painful, enlarging wound on his right abdominal wall. He was started on IV antibiotics, but his wound continued to progress. He had a large necrotic wound on his right abdominal wall (Figure 1). The necrotic tissue was extensively debrided down until healthy, bleeding tissue (Figure 2), and the wound was then closed with rotational advancement flaps. He was continued on IV antibiotics.

Five months later, he represents directly to plastic surgery stating, “I was cleaning my garage, and another spider must have bitten me” 2 days prior to presentation. He had a 10x8cm necrotic lesion with surrounding erythema on his left abdominal wall (Figure 3). His wound was debrided and closed with rotational flap advancement. Ten months from his initial wound, the patient’s wound healed but with scar from the extensive flap procedure (Figure 4).

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**Figure 1 - CL at initial presentation with a large dermatonecrotic ulcerative lesion of his right mid and lower abdomen.**

**Figure 2 - CL following wide surgical debridement until healthy, well-vascularized tissue.**
Patient JC
JC is a 42-year-old male who states he noticed an “insect bite” 14 days prior to presentation with progressive increases in pain, size, and discoloration. He was treated in the ED with antibiotics but not wound care. He had a 2x3 cm necrotic lesion with surrounding erythema (Figure 5). His wound was debrided and the patient was treated with wound care and antibiotics. Eight-week follow-up demonstrated good wound healing (Figure 6).

Patient SD
SD is a 35-year-old male who states he saw a “bite mark” on his left upper thigh 6 days prior to presentation with progressive swelling, erythema, discomfort, and blistering with fevers. He had a 2x2 cm necrotic ulcerative lesion with circumferential erythema and induration. The wound was debrided, and patient was treated with wound care and antibiotics. Six-week follow-up revealed complete resolution.
**Patient PD**
PD is a 67-year-old female with multiple myeloma on chemotherapy awaiting bone marrow transplant who was referred to plastic surgery while admitted for a soft tissue infection. She first noticed a "small red mark" on her left lateral calf 14 days prior to presentation that was initially pruritic and became increasingly painful with blister formation. She had a 2.5x2.5 cm lesion with central necrosis and surrounding erythema, induration, and tenderness.

**Patient CK**
CK is a 28-year-old male who states "I woke up with a bug bite" 8 days prior to presentation. He first noticed a red spot with itching and discomfort that increased in size and developed blister formation. He had a 1x1.5 cm purulent ulcerative lesion with erythema and edema.

**Patient KM**
KM is a 53-year-old male who noted a red mark on his leg 5 days prior to presentation that was pruritic, erythematous, warm, and tender and then developed ulceration and blistering. Exam demonstrated a 1x2 cm purulent ulcer with surrounding erythema and induration.

**Patient HC**
HC is a 51-year-old man who, 7 days prior to presentation, was chopping trees in the woods and noticed a small "blister" on his hand the next morning that he thought was a "bug bite." The lesion developed pro-
gressive pain, swelling, and discoloration. He had a 1x1 cm necrotic ulcer on the dorsum of his hand overlying the MCP joint of the right index finger.

**Patient NM**

NM is a 27-year-old female who noticed a “red bug bite mark” on her right calf when she woke up 4 days prior to presentation. The lesion was intensely pruritic and progressed to discomfort and pain with blistering. She had a 1x1 cm pruritic, bullous lesion on medial right calf with surrounding erythema.

**Patient AM**

AM is a 24-year-old female who states she woke up after an afternoon nap with a “bug bite” on her right neck 5 days prior to presentation. The lesion became firm, raised, pruritic, and painful. Of note, patient recently moved to a new house and saw “a lot of spiders” while moving boxes a week ago. She had a 1x1 cm pruritic ulcer on the right lateral neck.

**Patient CD**

CD is a 36-year-old male who states he woke up 4 days prior to presentation with bite marks on his left cheek, similar to a “spider bite” he had on his hand a year ago. The lesion became firm, raised, pruritic, painful, and purulent. Patient states two days of antibiotics started by his PCP did not improve his symptoms. Exam revealed a 0.5x0.5 purulent ulcer on left upper cheek.

**Patient SY**

SY is a 60-year-old male who states he noticed a red bump one week prior to presentation that became progressively more painful. He states he thinks it was a spider bite because he sees a lot of spiders on the dock he works at and has had a history of similar lesions. Exam revealed a 1x1 cm ulcerative lesion with central necrosis and surrounding erythema.

**Discussion**

This case series presents 11 patients with acute-onset dermatonecrotic ulcerative lesions referred to a single community plastic surgeon during a 1-month period. All 11 patients, except CL and PD, were initially treated by their PCP or the ED with antibiotics, without resolution of the wound. Upon referral to our practice, all patients underwent wound debridement and were managed with local wound care and antibiotics, and all patients healed well without complications.

What makes this series important and why we wished to share our experience is that, unlike other wound patients referred to plastic surgery, there was no clear cause in any of these patients. Every patient reported being in their usual state of health and then waking up the following morning with a small lesion. What is interesting is that these patients, unprompted, stated something like “a bug bites me,” “I noticed bite marks,” “I got a bug bite that got worse,” etc. We are not trying to refute the data that demonstrates that brown recluse spiders, which are the primary arthropod bite that causes necrotic skin lesions, are not the cause of such lesions. Instead, we found it peculiar that so many patients presented with very similar stories, specifically thinking some form of insect bites them, and very similar skin findings. The presentation and time course of these patients are similar to that previously reported by clinicians who attributed these dermatonecrotic wounds to brown recluse spider bites. Furthermore, most of these “bites” are reported to occur in warmer climates or months, similar to the patients in this study. The experts on spider bites stake one of their arguments on the fact that review of patients who had an initial diagnosis of a spider bite eventually were diagnosed with another medical condition. However, no studies have been able to consistently identify the true etiology. For example, in one study of 216 reported brown recluse spider bites, an alternative diagnosis was definitively determined in only 9 (8). Furthermore, those causes are also quite rare and are typically associated with systemic symptoms. The patients in this series were in their usual state of health, had a definitive starting point and course of their skin lesion, and had no other systemic symptoms. While the evidence that brown recluse spider bites are not the cause of these patients’ lesions is convincing, certainly something has to explain the seemingly consistent clinical presentation and dermatologic timeline of such lesions. Is it not possible that possibly another insect or something else environmental could be the cause of all these lesions? Ultimately, it may be best to just call such presentations as acute, idiopathic dermatonecrotic lesions.

While the etiology of these lesions may lead to interesting discussion, the more important discussion is how to effectively manage these patients. Fortunately, all patients presented relatively early in their time course, and both primary care, dermatology, and emergency medicine providers referred the patients to plastic surgery for wound care. Early referral to plastic surgery allows for proper wound debridement and wound care to prevent spread of tissue necrosis as well as good skin care and cosmesis. Delayed recognition and referral results in worsening of wound and need for more intensive wound care including flap reconstruction or skin grafting. We recommend primary care and emergency medicine physicians to consider recommending their patients who present with acute dermatonecrotic ulcerative lesions to plastic surgery or other surgical professionals to allow for proper treatment, as antibiotics alone often does not treat the disease.

**References**

3. Rhoads J. Epidemiology of the brown recluse spider