

Deep venous thrombosis after brown recluse spider bite: A rare case report

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The authors stated that the written consent was obtained from the patient presented with images in the study.

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Abstract

Deep vein thrombosis (DVT) is a severe condition marked by the formation of blood clots in the deep veins, usually in the lower limbs. Though DVT is frequently associated with prolonged immobility, trauma, and certain medical conditions, it is exceptionally rare following a brown recluse spider (*Loxosceles reclusa*) bite. Typically, this spider's envenomation causes local necrotic skin reactions, hemolysis, and in serious cases, systemic loxoscelism. In this case report, we present an unusually rare occurrence of DVT developing in a 53-year-old male after a brown recluse spider bit his lower limb. This case underscores the need for vigilance in identifying thromboembolic complications in patients with severe loxoscelism. Clinicians should be aware of the potential systemic effects of spider envenomation and consider early diagnostic and therapeutic interventions to prevent complications, including pulmonary embolism.

Keywords: brown recluse spider bite, deep vein thrombosis, loxoscelism, spider envenomation, brown recluse spider, *Loxosceles reclusa*

Introduction

Brown recluse spiders (*Loxosceles reclusa*) are among the most venomous arachnids in North America [1]. Envenomation from their bites can lead to dermonecrotic arachnidism and systemic loxoscelism, symptoms of which can manifest as hemolysis, thrombocytopenia, renal failure, and in rare cases, thromboembolic events [2]. However, the pathophysiological link between spider envenomation and deep vein thrombosis (DVT) remains unclear, but it may involve venom-induced vascular endothelial damage, inflammatory responses, and platelet aggregation [3,4].

This case report aims to document an unusual occurrence of DVT following a brown recluse spider bite and to explore potential mechanisms involved in this rare complication. The case emphasizes the need for healthcare providers to consider thromboembolic events as potential complications in cases of spider envenomation and to promptly initiate appropriate diagnostic and therapeutic measures.

Case presentation

A 53-year-old male arrived at the emergency department (ED) due to progressive pain and swelling in his right lower leg. Two weeks prior, he had been bitten by an insect in his basement, which resulted in painful lesions on his right lower leg and forearm (Figure 1). As time passed, he noted increased leg swelling and discomfort, which led him to seek medical help.

His medical history included hypertension, diabetes mellitus, asthma, a history of knee replacement, and obesity. A physical examination showed an eschar with surrounding erythema at the bite site (Figure 1a) and +2 pitting edema in his right calf.

A modified Wells' score of two suggested a moderate pretest likelihood of DVT, which warranted further imaging. Indeed, a venous duplex ultrasound confirmed DVT in the right common femoral vein (CFV), superficial femoral vein (SFV), popliteal and peroneal veins, along with superficial venous thrombosis in the right greater saphenous vein (GSV) (Figure 2). Results from extensive hypercoagulability testing were unremarkable (Figure 3). Ultimately, the patient was diagnosed with DVT which was provoked by the insect bite. He was started on therapeutic anticoagulation with Lovenox, which was later replaced with direct oral anticoagulants upon his discharge.

Figure 1: a. Erythematous papule with eschar in the center on the right lower extremity b. Healed insect bite on the right upper extremity.

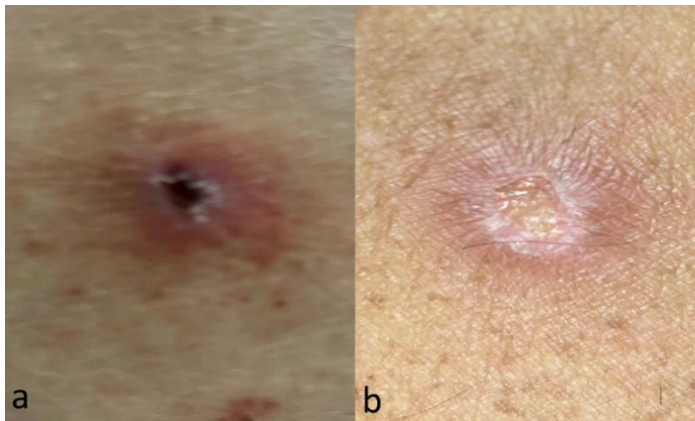


Figure 2: a. Depicting the thrombotic lesion, somewhat echogenic and maybe sub-acute chronicity b. Depicting the dilated and non-compressible Right mid-CFV.

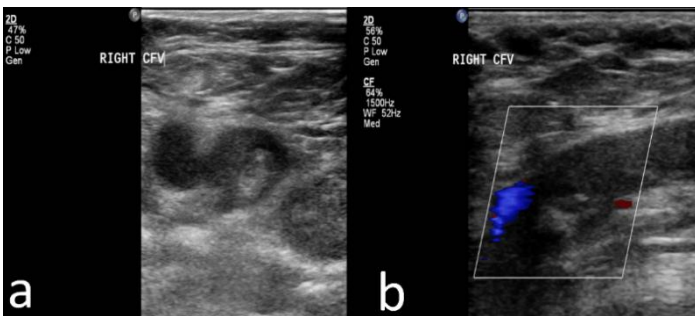


Figure 3: Hypercoagulation workup.

Test	Flag	Value 1	Value 2	Reference
PT		10.6	10.9 ↓	10.2
INR		0.87	0.90	0.85
DRVVT Screen	*	33	*	34
Antithrombin III Assay	*	92	*	90
D-Dimer Assay, Plasma	*	↑ 441		
Factor V Assay		*	96	
Factor V Leiden Mutation	*	NEGATIVE		
Partial Thromboplastin Time		33.8	31.6	29.8
Protein C Functional Assay	*	127	106	
Protein S Functional Assay	*	93	↓ 47	

Discussion

DVT is a multifactorial condition influenced by Virchow's triad: endothelial damage, venous stasis, and hypercoagulability [4]. The temporal link between the brown recluse spider bite and DVT formation suggests a venom-induced prothrombotic state [5].

Phospholipase D, a significant venom component, has been implicated in hemolysis, increased vascular permeability, and platelet aggregation [2]. Additionally, systemic inflammation and immune responses to venom proteins might exacerbate endothelial injury and thrombus formation. Although systemic loxoscelism is a known complication, DVT as a consequence remains exceptionally rare [6].

While this case showcases a potential association between brown recluse envenomation and DVT, other contributing factors should be considered. The patient's obesity and age are recognized risk factors for thromboembolism, but they do not fully explain this extensive DVT in a physically active patient with a history of knee replacement [3]. Previous literature, including a report by Surana et al. [5] on recurrent DVT following a brown recluse spider bite, suggests that spider envenomation might serve as a provoking factor in thromboembolic events. Nevertheless, further research is required to establish causality.

This case underscores the need for clinicians to maintain a high level of suspicion for thromboembolic events in patients presenting with systemic complications of brown recluse envenomation. Early recognition, comprehensive risk assessment, and swift intervention are crucial for maximizing patient outcomes [7].

Conclusion

This case report describes a rare occurrence of DVT developing after a brown recluse spider bite. Loxoscelism is traditionally associated with necrotic skin lesions and systemic toxicity, but this case emphasizes the potential for severe thromboembolic complications. The venom's inflammatory and pro-coagulant effects may aid in thrombus formation. Early recognition, a multidisciplinary approach, and anticoagulation therapy are essential for effective management. More research is needed to better comprehend the pro-coagulant effects of Loxosceles venom and to devise appropriate management strategies for affected patients.

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