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ENVENOMATION BY AN ARACHNID (*LATRODECTUS* OR *STEATODA*): CASE REPORT INVOLVING A WOMAN AND HER FEMALE DOG

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Palabras clave: Arachnida; Mordeduras por arañas; Reporte de Caso; Humano; Canino; *Steatoda*; *Latrodectus*.

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ABSTRACT

Introduction: Accidents involving spiders bites usually cause mild medical reactions that lead to local symptoms and, less commonly, systemic effects. The most medically significant spiders belong to the genera *Latrodectus* and *Loxosceles*. This paper presents a possible case of steatodism in a young woman and her pet.

Case description: 26-year-old female patient, who reports a clinical history characterized by paresthesia, malaise, fever, diarrhea and a painful papule in the left cheek after being bitten by a spider. Immediately after being bit, the patient hit the spider with the back of her hand and it fell to the ground, where her dog swallowed it. The dog presented with vomiting and general discomfort after ingestion. Symptomatic therapy was given for comfort, and neither the patient nor the dog required antivenin therapy. Both evolved favorably.

Discussion: The relevance of this case is the involvement of two mammals (a human and her dog) due to the accidental contact with a spider, possibly of the genus *Latrodectus* or *Steatoda*.

Conclusion: Two possible cases of steatodism are described. Since spider bites are a relatively frequent reason for medical consultation in Colombia, it is important to diagnose and manage them properly.

RESUMEN

Introducción. Los accidentes producidos por arañas suelen ser eventos médicos poco severos. La mordedura provoca, por lo general, síntomas locales y, menos frecuente, efectos sistémicos. Las arañas más importantes desde el punto de vista médico pertenecen a los géneros *Latrodectus* y *Loxosceles*. Se reporta un posible caso de steatodismo en una mujer joven y su mascota.

Presentación del caso. Paciente femenino de 26 años quien presenta cuadro clínico de 5 días de evolución caracterizado por parestesia, malestar general, fiebre, diarrea y una pápula dolorosa en la mejilla izquierda después de ser mordida por una araña. La joven golpea la araña inmediatamente con el dorso de la mano y esta cae al suelo, donde su perra la ingiere; esta última presenta vómito y malestar general después de la ingesta. Como tratamiento se administró terapia sintomática y ninguna de ellas requirió antiveneno. Ambas evolucionaron favorablemente.

Discusión. Se presentan dos posibles casos de steatodismo, siendo el aspecto relevante del presente caso que tanto la paciente como su mascota presentaron síntomas debido al contacto accidental con una araña, posiblemente del género *Latrodectus* o *Steatoda*.

Conclusión. Dado que los accidentes por mordedura de araña son relativamente frecuentes para la consulta médica en Colombia, es importante diagnosticarlos y manejarlos de forma adecuada.

INTRODUCTION

Spiders have been one of the most feared groups of arthropods for centuries (1-3), still knowledge on the clinical effects of their bites is substantially scarce. (4,5) However, it is known that out of approximately 40 000 described species of spiders (6), the majority are not medically significant. (5)

While most spider bites cause mild reactions (7), some species can cause severe damage at the local and systemic levels with lasting consequences, even death. (5) The most dangerous species for humans belong to two + genera of spiders, namely *Latrodectus* spp., from the Theridiidae family (i.e. black widow), and *Loxosceles* spp., from the Sicariidae family (i.e. brown recluse); other important group

includes some mygalomorphs (i.e. funnel-web spider). (5) Bites involving these genera occur worldwide and may have a wide array of clinical effects and manifestations. (5,7)

In this regard, all spider bites have a variety of signs and symptoms that can be divided into local and systemic. (5,7,8) In cases of latrodectism and steatodism, the clinical manifestations are similar (Table 1), although the latter is usually less severe. (7,9) Local manifestations include pain, pruritus, edema and erythema, whereas systemic symptoms can include abdominal or thoracic pain, nausea, diaphoresis, malaise, fever and headache. (5,7,8) Other species of spiders can cause blisters, ulcers, necrosis and more severe organ involvement (for example *Loxosceles* spp.). (5,7,8)

Table 1. Symptoms of *Latrodectus* and *Steatoda* envenomation

Latrodectism	Steatodism
Bites are generally painful	Painful bite
Erythema	Erythema
Swelling	Swelling
Isolated diaphoresis, asymmetrical regional diaphoresis, below knee diaphoresis	Isolated diaphoresis is less common
Malaise	Malaise
Muscle spasm and cramps	Muscle spasm and cramps
Increased autonomic function (tachycardia, tachypnea and hypertension)	Facial flushing
Piloerection	Piloerection
Nausea	Nausea
Headache	Headache
Central punctum	Papule
Burning sensation in the site of the bite	Pruritus
Abdominal pain	Abdominal pain
Chest pain	
Back pain	
Rhabdomyolysis	
Myocarditis	
Myalgia	
Vomit	
Priapism	

Source: Own elaboration based on (10), (11), (12), (13), (14), (15) and (16).

The clinical similarity between these two species may lie on the fact that *Latrodectus* and *Steatoda* belong to the same family of spiders (Theridiidae) and share α -latrotoxin, which is highly divergent among the members of the family. (17) The neurotoxicity of this venom is characteristic and may cause the release of norepinephrine and acetylcholine in an exhaustive manner. (18) The secretion of these neurotransmitters seems to be secondary to calcium dependent and independent mechanisms. (19,20) Opioids and muscle relaxants administration is the most recommended therapy for latrodectism (21), whereas antivenin use should be considered only in severe envenomation cases. (21) For decades, antivenin has been considered effective for the treatment of latrodectism (22), although a recent clinical trial claims otherwise. (23) On the other hand, analgesic treatment seems to be sufficient for *Steatoda*, although *Latrodectus* antivenom could be effective in some cases. (24)

For comparison purposes, adequate treatment in cases involving another relatively common spider in the region (25), *Loxosceles* spp., contemplates: rest, ice, compression and elevation (RICE) (26-28), although wound care and surgical intervention may be needed in severe cases (this is recommended from 6 to 8 weeks after the bite to allow tissue healing). (26) Treatment and manifestations are different considering the toxins present in this venom, including phospholipase-D, metalloproteinases and hyaluronidases, which explain the possibility of necrosis and ulcers. (29)

This article presents the case of a female patient who was bitten by a spider, and her pet, which ingested it afterwards.

CASE DESCRIPTION

26-year-old female patient, Caucasian, from a lower-middle class household, who lives in a

town near Bogotá at approximately 2 600 meters above sea level, alone with two dogs. Her medical history includes kidney stones, several urinary infections, fracture of the 4th and 5th metatarsal bone in the left toes, and tympanic membrane perforation of the left ear. The patient reported that she had never undergone surgery and that she did not use recreational drugs or prescribed medications of any kind. She had a family history of diabetes (maternal grandfather), cancer (maternal grandmother, unknown type) and arthrosis (paternal grandmother).

The following is the timeline of the events:

04/05/2019 (20:45): The patient was bitten by a spider on the cheek while she was lying in bed. She immediately hit it with the back of her hand to remove it. After this action, the spider fell to the floor and one of her dogs ate it.

04/05/2019 (20:45–20:50): She developed local pain, pruritus, erythema and paresthesia immediately after the bite. The erythema had a diameter of approximately 5cm.

04/05/2019 (20:50 – 20:58): Appearance of an endured and painful papule with possible fang marks according to the patient (Figure 1).

04/05/2019–08/05/2019: No exanthema, blisters, pustules, necrosis or ulcers developed. No ocular, orbital, moderate or severe neurological involvement occurred. She referred continuous improvement of erythema, pain and pruritus. Mild reduction in the size of the papule. Disappearance of paresthesia. She developed fever (38.5°C), diarrhea without mucus or blood, malaise, asthenia, adynamia, and lower back pain. All symptoms resolved within three or four days following the bite. Regarding the dog, she referred that it showed asthenia, salivation, adynamia, vomiting and malaise (Figure 2). She denied other physical signs and symptoms in the dog such as hypothermia, muscular fasciculations, diarrhea, dyspnea, claudication or aggressiveness.

09/05/2019: Day of consultation and visit. The pain and itching were still present but they were not as severe. Lesion and erythema had decreased to 5mm. Systemic symptoms were absent. She was given antipyretics and analgesics for comfort (Ibuprofen 400mg every 6 hours). As her symptoms were mild and her clinical course was uneventful, she did not

require further therapy or antivenin. There were no adverse reactions to therapy or during the course of the disease. Laboratory exams were not requested. The dog seemed to be mildly dehydrated, but it was improving rapidly. There was no evidence of a bite site; however, the patient was advised to seek veterinary help, which she did.



Figure 1. Spider bite on the left cheek. Localization and appearance five days after the bite.

Source: Own elaboration.



Figure 2. Place where the bite occurred. Patient's pets, which are of mixed race. The black and white dog was the one that ate the spider.

Source: Own elaboration

Some photographs were shown to the patient and she identified species of the genera *Latrodectus* or *Steatoda* as the possible arachnids that bit her. She stated that there were some spiders outside her house that were similar to the spider that bit her (Figure 3).



Figure 3. A. Spider that the patient said was similar to the one that bit her. The spider had nocturnal habits. B. Close-up of the spider where cephalothorax is visible. C. Lateral plane of the spider. The patient did not allow collecting this specific specimen for further identification.

Source: Own elaboration.

Taking into consideration the myriad of manifestations and the epidemiological importance of spider bites, the authors consider that this case was possibly caused by *Latrodectus* sp. or *Steatoda* sp. This accidental contact with a spider affected and caused toxicity in two different mammals (an owner and her pet) through a different route. Written informed consent was obtained from the patient for the publication of this case and the photographs.

DISCUSSION

Several spider species are known to have venom that causes harm to humans; unfortunately, good evidence coming from case reports is scarce, even considering that spider bites are relatively common. (30) For example, many of the published cases cannot be regarded as definitive spider bite incidents (5), since they do not fulfill the following characteristics (31): 1) evidence of a spider bite; 2) collection of the spider immediately after the bite; 3) identification of the spider by an expert. The last step is important because clinicians and medical staff can misidentify the spiders and catalogue the case erroneously. (5)

With these in mind, and bearing in mind the clinical characteristics reported by the patient, it could be said that this case report exposes five important clinical aspects. The first one is that physicians have to evaluate spider bite cases in an individual manner as most spider bites self-resolve and require neither extensive medical therapy nor the use of antivenin. (5,7)

The second aspect is the possible involvement of other people or species, in this case, the pet of the patient which ingested the spider. After ingesting the spider, the dog presented with envenomation through mucosae, which, to our knowledge, is not often reported. One example is the case of

a patient who was affected through the conjunctiva after being exposed to the body of a *Latrodectus hesperus*. (32) This type of cases may occur because *Latrodectus* spiders have toxins distributed throughout the body (33), and venom can be found even in their eggs (34); similar envenomation cases have been reported with other arthropods such as the puss caterpillar. (35) Unfortunately, cases similar to the dog could not be found, but the following questions remain:

- Do *Steatoda* spiders, in a way similar to *Latrodectus*, have toxins distributed throughout their bodies?
- Even without evidence of a bite site, did the spider in question bit the dog in the tongue or another part of the mouth?
- Did the dog get sick from another cause?
- Was another group of spiders involved?

The third characteristic is related to the photographs showed to the patient. It is necessary to wonder how useful or precise such action is. In this regard, were the clinical history and physical exam enough to reach a diagnosis? Did the patient see enough of the spider to recognize it? Was it really easy for her to recall the details and characteristics of the arachnid? This is important because these animals evoke an especial fear in people (36) and patients are anxious after being bit. In this case, the spider presented to us by the patient seems to have an orb web pattern (possibly an *Araneus granadensis* specimen) (37), while *Latrodectus* and *Steatoda* build them with a different pattern. (38,39)

The fourth aspect involves the challenge of making a definitive bite diagnosis. In this case, there was history and evidence of the bite, but the spider could not be collected as it was eaten by the dog.

Finally, the fifth characteristic was the refusal of the patient to collect a similar specimen (specifically the one she pointed). This fact, as well as the one mentioned in the previous paragraph, did not allow identifying the possible type of spider involved in the incident. In this case, it was especially relevant since the genera *Latrodectus* and *Steatoda* can be mistaken by patients and physicians, not only because of the shape of the spider's body, but also because the symptoms they cause are similar. (12) Both steatodism and latrodectism can present with erythema, pain, paresthesia, autonomic involvement, abdominal pain and papules. (16,40-42) However, steatodism tends to have milder manifestations and a shorter clinical course, while some clinical signs show a different pattern. (7,10)

With all this in mind, the cases presented in this report are considered to be secondary to the bite, and ingestion, of an unidentified *Steatoda* spider. Four main reasons support this conclusion:

1. Steatodism is suspected since the symptoms of the patient and her pet were not severe and they resembled low-grade latrodectism. (15)
2. The clinical history and course of these cases are similar to other reported bites caused by this genus of spider, either in Latin-America (43) or other parts of the world. (16)
3. This group of spiders are considered synanthropic and cosmopolite (44) and have been reported in several world regions (including South America). (43,45)
4. *Steatoda nobilis*, known as the noble false widow, is a highly invasive species and could have been involved in this case. (46,47) Its presence has been reported recently in Colombia (specifically Bogotá D.C.), Ecuador (44), Chile, and Argentina. (43,45)

Consequently, due to the mild presentation, the similarity with other cases of steatodism, the previous report of *Steatoda nobilis* near the area (44) and its similarity with low-grade latrodectism (15), this could be considered as a probable steatodism case, although it cannot be considered as a definitive diagnosis.

Most spider bites are mild in nature, but overemphasis on severe cases can sometimes lead to the use of unnecessary clinical measures, increase the cost of medical care, and reinforce popular beliefs, fears and myths surrounding spider bites. (5,7) This is particularly true for *Steatoda nobilis* as the media, in order to increase revenue and website traffic, makes sensationalist statements about its bite. (48,49) Nevertheless, necrosis or severe outcomes due to spider bites can happen but are extremely rare and secondary to the bite of certain spider species. (16) Lack of knowledge on these facts can generate the propagation of wrong information that contradicts experts. This is especially important because physicians and patients that live in non-endemic areas may believe that they know more about the distribution, identification and clinical characteristics of incidents involving spiders. (5,7) This happens in such a manner that clinicians can diagnose these attacks based on the remote possibility of transported spiders or minimal exposure, even when the spider is never found, seen or identified, or there is not a clear history of contact. (5,7)

In any case, although some spider bites are clinically important with dire consequences, these are the exception. Emphasis on spider bites has led to misdiagnosis of a wide array of diseases, sometimes with irreversible, serious or fatal consequences, as is the case of cancer and infectious diseases such as methicillin-resistant *Staphylococcus aureus*. (5,7)

Lastly, the strengths of this case are the extensive literature search conducted, the thorough medical examination and the comprehensive assessment of the patient. Its weaknesses were the impossibility of collecting and identifying the spider by experts and the lack of laboratory exams.

CONCLUSION

This case makes clear that not all spider bites should be the cause of apprehension and anxiety for the patient, given that most are self-resolving and need only analgesics and anti-inflammatory drugs. Treatment of spider bites can require more aggressive therapies, but this is established according to the situation. This article presents two possible cases of steatoda secondary to the accidental contact with a spider. This diagnosis is suspected due to the clinical characteristics and reported presence of the spider in the area. This case is novel because of the involvement of a female dog that was also affected by the same spider although in a different manner. It is necessary to better educate not only physicians but also patients to reduce and prevent further episodes of spider bites and to reduce the, sometimes, irrational fear of these arthropods. The limitations of this case include the lack of diagnostic tests in both the owner and the pet and the absence of the spider for collection and subsequent identification.

PATIENT'S PERSPECTIVE

The patient reports that she has no further concerns, that the pain in her face diminished and no other episode of fever appeared. She also reports that her dog is improving, although it still has some discomfort and vomit episodes. She is not worried about the skin area involved

because it was a small lesion and it is improving rapidly. She is not preoccupied for her dog either since its condition is also improving and was never dire.

CONFLICT OF INTERESTS

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