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Case Report

An unusual two-stage infection following a scolopendra bite

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Abstract

Background: Scolopendrae represent the best-known genus of centipedes. They are nocturnal general feeders with strong mandibles and venomous fangs which leave visible puncture marks at the bite site. The bite accidents occur during the warm rainy season and mostly take place on the extremities. Following the bite, the most common symptoms are mild: limited localized erythema, pain, swelling, local itching and burning sensation. However, more severe local and systemic sequelae can not be excluded. *Method:* we report the case of a 63-year-old man with fever and a widespread edema of the right hand and forearm, happened as a consequence of a Scolopendra Subspinipes bite. During the weeks following the bite, he developed a severe unusual superinfection via hematogenous dissemination, which required a double surgical debridement and a targeted intravenous antibiotic therapy. *Results:* the complete clinical recovery took over two months. *Conclusions:* Many victims of Scolopendra envenomation do not seek medical attention since most symptoms will resolve spontaneously. The case presented falls within the spectrum of those rare cases which escalate due to bacterial superinfection.

Keywords: Centipede Envenomation, Scolopendra Bite, Upper Limb Infection

Introduction

Scolopendrae represent the best-known genus of centipedes. [1] Centipedes are Arthropods belonging to the Chilopoda class. They are among the oldest living venomous predators on the planet. [2] The genus Scolopendra comprises a large spectrum of scolopendromorph centipedes that are distributed worldwide, especially in tropical and subtropical countries. More than 80 species of Scolopendra have been discovered, yet there is not a proper definitive classification available. Among those, S. Gigantea, S. Alternans dwell in the Caribbean islands, and S. Subspinipes, although more easily encountered in south-east Asia, inhabits Caribbean as well. The most dangerous species quoted in the international literature are S. Subspinipes, S. Cingulata. Being invertebrates, they strongly rely on their exoskeleton as a mechanical barrier to protect themselves against pathogens and external harms. Furthermore, to attack and get food, and to defend themselves from predators, as other Centipedes, they have strong mandibles and venomous fangs, called forcipules, which stem from their 1st pair of legs (modified limbs). Scolopendrae are nocturnal animals; they settle in dark moist places, taking shelter under stones, leaves and underground galleries. They are generalist feeders; most frequently, bite accidents occur during the warm rainy season, from October to March, and mostly take place on the extremities (hands, feet). [3] Scolopendra genus often leave visible puncture marks at the bite site. Following the bite, the most common reported symptoms are mild: limited localized erythema usually taking up a less than 5 cm circular area, pain, swelling, local itching and burning sensation. Systemic symptoms are less frequent and consist of headache, racing pulse, nausea, vomiting. Severe

sequelae are extremely rare and include : skin necrosis around the bite site, lymphangitis with local lymphadenopathy of the bitten limb, compartment syndrome, allergic reaction, proteinuria, rhabdomyolisis, syncope, coronary ischemia. The milestone of initial treatment is an appropriate analgesia, best performed with ice packs and analgesics such as Paracetamol, Ketorolac, and Opioid Narcotics. [4] Topical or systemic steroids and antihistamines are used as well. Tetanus prophylaxis is also recommended. [5] In case of severe symptoms onset, a targeted therapy will be administered.

Case Presentation

Last February, a 63-year-old man was admitted to our Emergency Department with a widespread edema of the right forearm and fever (ranging from 37.5 to 38.5 °C) started 2 days before. On clinical examination he was observed to have a 2 x 3 centimeters erythematous lesion, with skin desquamation and a central double puncture wound at the ulnar side of the forearm (fig.1). A purulent drainage was found when squeezing the puncture wounds. He complained of severe pain, burning and paresthesia extended to the right hand. He reported to be in good general health, with no history of major diseases. The skin reaction appeared as a consequence of a Scolopendra Subspinipes bite, happened during a trip to Santo Domingo one week before. After the bite he went to the local Emergency due to bleeding at the site of the bite and perilesional itching. Tetanus prophylaxis was administered; in addition, ice packs, Paracetamol (2 g / day) and Prednisone (25 mg / day) were prescribed. However, he stated not to have regularly taken his medicines and to have continued sea baths without any bandage. It was then performed

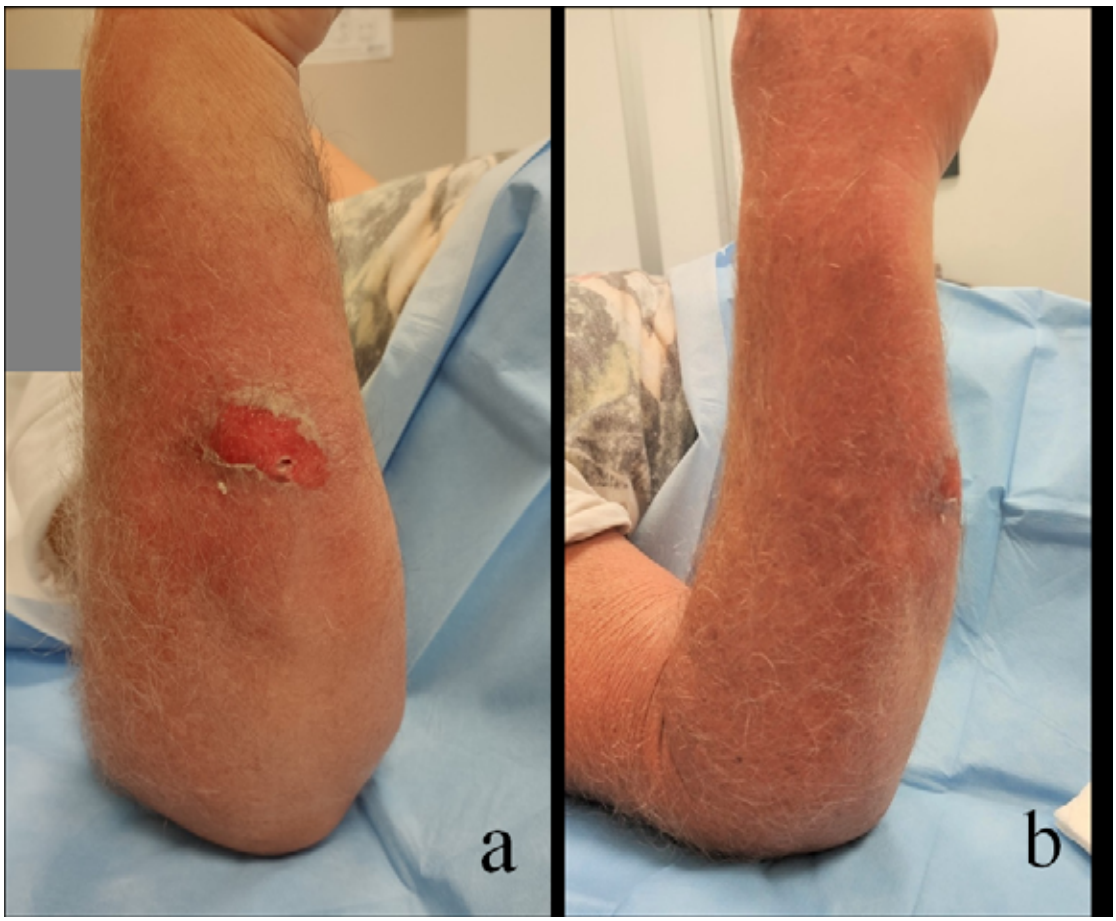

Figure 1. a-b) Erythematous lesion surrounding the Scolopendra's double puncture wound

an ultrasound evaluation which brought to a diagnosis of supra-fascial cellulitis of the right forearm. Laboratorary findings showed leukocytosis (white blood cells: 18.7 x 10^9/L) and C-reactive protein (CRP) increase (223 mg/l). According to infectiologists, it was decided to perform a surgical debridement. Multiple samples of pathological tissue were collected for culture tests. Empirical antibiotic therapy with intravenous Amoxicillin/Clavulanic Acid (2.2 g 3 times a day) was started only after the tissue samples had been taken. Culture tests showed the presence of a microbial superinfection caused by Staphilococcus Aureus (S.Aureus) sensitive to Amoxicillin. The Amoxicillin/Clavulanic Acid intravenous administration was prolonged for 6 days. The therapy was then shifted to oral administration at the dose of 875/125 mg 3 times a day and stopped after 8 additional days, at the complete wound healing and CRP values normalization. Nevertheless, 5 weeks later he came back to our Emergency with a bullous skin lesion at the dorsal side of the right thumb, marked edema of the hand, severe pain and paresthesia of the fingers (fig.2). CRP value was 53.9 mg/L, white blood cells were 13 x 10^9/L. A second surgical debridement was performed. Tissue samples for new culture tests were collected. Dorsal fasciotomy of the thumb and a precautionary dorsal double-fasciotomy of the second and fourth inter-metacarpal spaces were executed. Intravenous antibiotic therapy with Amoxicillin/Clavulanic Acid was restarted and prolonged for 10 days, as the culture tests results showed once again a S.Aureus Amoxicillin-sensitive infection. The patient was proposed to undergo hepatitis C, hepatitis B and HIV antibody tests to exclude a possible immunosuppression; however, he did not give his consent to the aforementioned tests. The second and fourth metacarpal dorsal fasciotomies were sutured 6 days later. The thumb fasciotomy was left to heal via secondary intention and took two months to reach the complete wound healing (fig.3).

Discussion

The aforementioned case of Scolopendra Subspinipes bite confirms the opinion of many authors, stating that the first main clinical presentation is a transitory local syndrome with severe pain, swelling, local itching and burning sensation, which may appear in minutes, hours, or days after the bite [6]-[9]. These skin reactions are caused by the composition of the venom, which consists of strong biologically active elements like serotonin, histamine, acetylcholine and hyaluronidase

Figure 2. Bollous skin lesion at the dorsal side of the right thumb

Figure 3. a-b-c-d) progression of fasciotomies' healing process over time

[10]. Many victims of centipede envenomation do not seek medical attention since most symptoms will resolve spontaneously. However, more severe local sequelae like skin necrosis around the puncture site, bacterial superinfection, lymphangitis of the bitten limb and compartment syndrome can not be excluded. Systemic involvement is extremely rare. Nevertheless, cases of systemic complications of varied severity are reported in literature. For this reason it is advisable, for patients affected by scolopendra bites, to be monitored at least 4/5 hours after the bite [11]-[13]. In drafting the paper, we looked for previously published articles

dealing with Scolopendra bites. A systematic review of literature was performed in PubMed, using the following research strings: "Scolopendra bites" (20 articles), "Scolopendra envenomation" (14 articles), "Scolopendra stings" (19 articles). Removing duplicates, out of 53, 30 records remained; with a further selection title-based we excluded 11 articles, not relevant for our purpose because dealing with Scolopendrae venomous composition or the insect biology and taxonomy. Among the 19 finally enrolled, most are case reports from tropical areas worldwide. Noteworthy articles, dealing with major and infrequent complications, report one case of acute encephalomyelitis following a Scolopendra Subspinipes bite [14], one case of cutaneous diphtheria due to unknown Scolopendra specie [15], one case of lymphangitis developed after a Scolopendra Heros bite [16], one case of intestinal pseudo-parasitism by Scolopendra Cingulta bite [17], one case of rhabdomyolysis and acute renal failure following the sting of Scolopendra Heros [18], and one case of fever associated to extensive hand and arm edema which occurred in a newborn, without major sequelae [19]. Since no specific antivenomous serum is available [20], the first line treatment of uncomplicated wounds should be supportive and consist of managing pain and inflammation with systemic analgesics, topical and/or systemic corticosteroids and antihistamines [7], [9], [21]-[23]. In addition, bite victims are recommended to receive immunization for tetanus [10]. Since the Scolopendra venom has been demonstrated to have a broad of antimicrobial activity against gram positive and gram-negative, as well as fungi, the risk of microbial superinfection is limited. Therefore, most authors consider antibiotic prophylaxis unnecessary as first line treatment [24]. In case of secondary infection, the wound should be cultured and a broad-spectrum antibiotic therapy should be started, while waiting for the culture test result for starting a targeted treatment [16]. The case presented falls within the spectrum of those rare cases which escalate due to bacterial superinfection. The aforementioned infection is to be ascribed to both the first line therapy failure and our patient's poor compliance. The peculiarity of this case is to be attributed to the secondary hematogenous spread of bacteria far from the bite site, rather than the superinfection itself. Therefore, we are inclined to believe that a more accurate clinical-laboratory monitoring of the patient in the weeks following the first surgical treatment could have let us prevent the bloodstream infection. In addition, there is a strong suspicious that our patient condition could have been facilitated by an underlying immunosuppression disease, which has never been excluded.

Conflict of Interest: All authors declare there is no conflict of interest.

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