

One Health Education for Future Physicians: A Case Report of Cat-Transmitted Sporotrichosis

M. Ihsan Kaadan,¹ Michael Dennis,¹ Nancy Desai,¹ Gopal Yadavalli,² and Philip Lederer²

¹Department of Medicine, Boston Medical Center, Boston, Massachusetts, USA ²Section of Infectious Diseases, Department of Medicine, Boston Medical Center, Boston, Massachusetts, USA

A healthy 35-year-old Brazilian woman presented with persistent redness, swelling, and multiple wounds on the hand 2 weeks after a cat bite in her home country. She was treated twice with amoxicillin-clavulanate but failed to demonstrate improvement. She then presented to our institution with a newly developed abscess on the right hand. Incision and drainage were performed and she was admitted to the hospital. She was subsequently treated with broad-spectrum antibiotics. Her symptoms improved but did not resolve. Four days after hospital discharge, a wound culture resulted as positive for *Sporothrix schenckii*. The patient was treated with itraconazole. Sporotrichosis is endemic in many countries including Brazil and is known to be transmitted by cat bites. Sporotrichosis should be considered in the differential diagnosis for patients who have symptoms of cellulitis after cat bites in an endemic area.

Keywords. Brazil; cat bite; sporotrichosis.

CASE REPORT

A previously healthy 35-year-old Brazilian woman presented with persistent redness, swelling, and multiple wounds on the right hand 2 weeks after a cat bite in her home country. While in Minas Gerais, Brazil, the patient had reached out to touch a wounded cat (possibly wild) and was bitten on the right hand. Soon after, she developed erythema, oedema, and pain. She was evaluated at a local hospital where she was prescribed 10 days of amoxicillin-clavulanate. She also received rabies vaccine and rabies immunoglobulin. She completed the 10-day course of antibiotics, after which she experienced an initial improvement in the hand swelling and erythema.

Received 27 December 2019; editorial decision 5 February 2020; accepted 9 February 2020.

Correspondence: M. Ihsan Kaadan, MD, MS, Primary Care Clinic, 801 Massachusetts Avenue, Suite 6A, Boston, MA 02118 (ihsan.kaadan@bmc.org).

Open Forum Infectious Diseases®

© The Author(s) 2020. Published by Oxford University Press on behalf of Infectious Diseases Society of America. This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs licence (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial reproduction and distribution of the work, in any medium, provided the original work is not altered or transformed in any way, and that the work is properly cited. For commercial re-use, please contact journals.permissions@oup.com DOI: 10.1093/ofid/ofaa049

Her symptoms returned 2 weeks after the attack. She then traveled to Boston, where she was seen in an emergency department. She was diagnosed with cellulitis and discharged with another 7 days of amoxicillin-clavulanate. She completed the antibiotics, but her hand swelling and pain progressed.

The patient then presented to our institution. Her vital signs were normal. She appeared generally well. Puncture wounds were noted on the dorsal aspect of the right hand, with wounds on the third and fifth digits (Image 1). Erythema and fluctuance were present and extended into the forearm. Range of motion was preserved in the hand and wrist joints. There was no palpable lymphadenopathy in the right upper extremity or axilla. Notable laboratory tests included the following: C-reactive protein 35.0 (reference range, 0–5 mg/L), erythrocyte sedimentation rate 72 (reference range: 0–20 mm/hour), and white blood cells 12.6 (reference range, 4.0–11.0 K/uL). An x-ray of the right hand showed soft tissue swelling at the third and fourth proximal phalanx. Osteoarticular infection was ruled out with x-ray as well as orthopedic surgery evaluation.

Incision and drainage were performed, and a wound culture was obtained. The patient was then admitted to the hospital for intravenous antibiotics. She received treatment with levofloxacin and clindamycin. A second incision and drainage were performed on the right hand on hospital day 4, after which her symptoms improved. She was discharged with a prescription for metronidazole and doxycycline.

Four days after discharge, the wound culture resulted positive for 1+ (Rare) *Sporothrix (Sporotrichum) schenckii*. Identification was performed by matrix-assisted laser desorption ionization time-of-flight mass spectrometry.



Image 1. Sporotrichosis involving the right hand on hospital day 5 (3 weeks after cat bite in Brazil).



Image 2. The right hand after 5 months of itraconazole therapy.

The patient was seen in the infectious disease clinic on day 6 after discharge. On that day, No improvement was identified in the hand wounds despite antibiotic therapy. Given the new diagnosis of sporotrichosis, she was prescribed itraconazole 200 mg once daily. Over the subsequent months, her hand oedema and wounds improved dramatically ([Image 2](#)).

DISCUSSION

Sporotrichosis is a subcutaneous mycosis that infects both humans and animals. Sporotrichosis is endemic in many South American countries including Brazil, and it is considered the main subcutaneous mycosis in that region [1]. The first recognition of sporotrichosis in Brazil was in 1907 [1, 2]. In the state

of Rio de Janeiro, there were approximately 2200 human cases reported from 1998 to 2009. Cats play a major role in transmitting this disease to humans by bites and scratches because they carry the fungus in their claws and oral cavity [3]. A case series conducted in Rio de Janeiro reported that 90.7% of 172 people with sporotrichosis had contact with cats [3]. The most common clinical presentation is the lymphocutaneous form of disease (55.6%) [4]. Although *Sporothrix brasiliensis* was the primary involved species in the outbreak in Rio de Janeiro, *S schenckii* was also thought to be transmitted in Brazil [1]. Considering the ongoing sporotrichosis epidemic in South America, patients who are coming from endemic areas presenting after cat bite with cellulitis should have this illness included on the differential diagnosis.

CONCLUSIONS

Sporotrichosis is yet another example of an emerging infectious disease due to increased contact between humans and animals. Implementing a “One Health” approach is essential to achieving better public health outcomes [5]. This can be achieved through considering the sporotrichosis epidemic as a priority for clinicians, public health practitioners, and the general public. The sporotrichosis epidemic can be viewed as a “canary in the coal mine,” a concern due to the anthropogenic forces of urbanization, globalization, and industrialization [6]. Medical education should increase its emphasis on emerging infectious diseases.

Acknowledgments

Potential conflicts of interest. All authors: No reported conflicts of interest. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest.

References

1. Caus ALO, Zanotti RL, Faccini-Martínez AA, et al. Epidemiological and clinical aspects of sporotrichosis in Espírito Santo State, Southeast Brazil: a study of three decades (1982-2012). *Am J Trop Med Hyg* **2019**; 100:706–13.
2. Lutz A, Splendore A. [Sobre uma micose observada em homens e ratos: contribuição para o conhecimento das assim chamadas esporotricoses]. *Rev Med* **1907**; 10:443–50.
3. Madrid IM, Mattei AS, Fernandes CG, et al. Epidemiological findings and laboratory evaluation of sporotrichosis: a description of 103 cases in cats and dogs in southern Brazil. *Mycopathologia* **2012**; 173:265–73.
4. Barros MB, Schubach Ade O, do Valle AC, et al. Cat-transmitted sporotrichosis epidemic in Rio de Janeiro, Brazil: description of a series of cases. *Clin Infect Dis* **2004**; 38:529–35.
5. World Health Organization. One Health. **2017**. Available at: www.who.int/features/qa/one-health/en/. Accessed 11 November 2019.
6. Lucey DR, Sholts S, Donaldson H, et al. One health education for future physicians in the pan-epidemic “Age of Humans”. *Int J Infect Dis* **2017**; 64:1–3.