Vol 1. Iss. 1 (January-June, 2025)

*Case Report*

# Lymphangitic sporotrichosis caused by cat scratch in an area of eastern Mexico

Jorge Leonardo Mayorga Garibaldi[1*], Cándido Contreras Méndez[2], Rodrigo Aguilar Alfonso[2], Alan Paz García[2], Jorge Arturo Mayorga Rodríguez[3], Mariana Lizett Zárate Torres[4], Yaxsier de Armas Rodríguez[5,6], Claudia Lizeth Cueto Aragón[7], Jaime Palomares Marín[5] and Giovanni Damiani[8]

*[1]Diagnostic and Research Unit in Medical Microbiology and Infectious Diseases, Guadalajara, Jalisco, Mexico;*
*[2]General Hospital, North Zone, Xalapa, Veracruz, México;*
*[3]Head of the Reference Center in Mycology, CEREMI, Dermatologic Institute of Jalisco, Mexico; "Dr. José Barba Rubio";*
*[4]Dermatologist, private practice;*
*[5]University Center of Health Sciences, Department of Microbiology and Pathology, University of Guadalajara;*
*[6]Pathology Department, Hospital Center, Institue of Tropical Medicine "Pedro Kouri" Havana, Cuba;*
*[7]Children's Hospital, "Eva Sámano de López Mateos" Morelia, Michoacán, Mexico;*
*[8]Italian Center of precision medicine and chronic inflammation, Milan, Italy; Department of biomedical, surgical and dental sciences, University of Milan, Italy.*

**KEYWORDS**

*sporotrichosis, Sporothrix schenckii sensu stricto, feline sporotrichosis, sporotrichosis in Mexico*

**CORRESPONDING AUTHOR**

Jorge Leonardo Mayorga Garibaldi
Diagnostic and Research Unit in Medical Microbiology and Infectious Diseases, Guadalajara, Jalisco, Mexico, Sierra Nevada
Tel: +(+52) 3320828527
leonardo_maygar91@hotmail.com

**ABSTRACT**

Sporotrichosis is an endemic mycosis caused by the dimorphic fungus *Sporothrix schenckii* sensu lato. This phenomenon has gained prominence in recent years due to its global prevalence, the recognition of multiple cryptic species within the originally described species, and its distinctive ecology, distribution, and epidemiology worldwide. Sporotrichosis, a human and animal disease caused by the *Sporothrix* species, is the most prevalent implantation mycosis worldwide. The classification of *Sporothrix* has undergone significant refinement in recent years, resulting in substantial progress in the fields of diagnosis, epidemiology, and treatment. Material and methods: we present the clinical case of a 15-year-old male, who was scratched by his cat on the back of the right hand, after 5 days developed erythematous-violaceous lesions. *Sporothrix schenckii sensu stricto* was diagnosed as the causal agent of both infections by using microbiological and proteomic tools (mycological culture and MALDI-TOF). Itraconazole 200mg twice daily for three months was prescribed with excellent clinical improvement.

## 1. Introduction

Sporotrichosis is an endemic mycosis caused by the dimorphic fungus *Sporothrix schenckii* sensu lato, is prevalent worldwide in tropical and subtropical areas. Patients with this infection usually present with "implantation mycoses" that is caused by transcutaneous trauma through which the fungal conidia enter the host. Such infections may progress into chronic cutaneous, subcutaneous, and/or even deeper infections involving the lymphatics, fascia, muscles, cartilage, and bones. Although sporotrichosis causes considerable morbidity, it is only rarely associated with mortality.

Among endemic mycoses, sporotrichosis is distinct in the supposed high prevalence of animal-to-human transmission of the disease. However, it is not clear how the yeast phase transmits the infection through this route since it is generally accepted that conidia of the mycelial phase are the infectious propagules for humans. However, the evidence from several studies of feline transmission provides compelling support for this means of transmission.

In a study by the Evandro Chagas Clinical Research Institute, Rio de Janeiro, Brazil, 83% of patients and 85% of dogs were reported to have contact with cats, 56% of humans reported being bitten or scratched by a cat with sporotrichosis preceding the occurrence of the disease among owners, and *S. schenckii* sensu lato was isolated from the skin and nasal and oral cavities of the animals (1).

Cutaneous sporotrichosis is contracted in two ways: through traumatic inoculation of the fungi through the skin. The classical clinical presentation is transmitted by plant debris, and the second (zoonotic form) is by animal transmission. Cat scratches are a well-documented source of the latter, but inoculation through a wound or open skin can also occur. Transmission through contact with the exudate (oozing fluid) of infected cats has also been reported. This zoonotic disease has prompted significant public health concern due to its persistence and subsequent dissemination throughout South America (2). The following factors have been identified as contributing to the potential for zoonotic transmission: engagement in activities such as playing in rural environments, residence in dwellings with unsealed flooring, and the presence of domestic felines within the household. In addition, the majority of documented cases have been observed in patients with a low socioeconomic status, females, and children. This is due to the fact that these demographic groups are more likely to engage in play activities with these animals.

Typically, patients deny the occurrence of the bite or scratch.

However, a preponderance of evidence indicates that the subjects in question cohabitate with felines (3).

## 2. Case report

We present the clinical case of a 15-year-old male, native and resident of Xalapa, Veracruz, Mexico, student, without significant personal pathological history who attended the infectious disease department of the General Hospital north of Xalapa with an erythematous-violaceous lesion with necrotic center and multiple nodules with lymphatic tract in the right upper extremity of five days of evolution (Fig. 1A), when questioning the parents of the minor, they stated that he was scratched by his cat on the back of his hand (Fig. 1B), and after five days he developed the aforementioned lesion with drainage of sero-purulent material, clinically it was diagnosed as lymphangitic sporotrichosis; however, samples were sent for mycological cultures to the center for diagnosis and research in microbiology and infectious diseases based in guadalajara, jalisco, mexico with the objective of evidencing the causal agent.

**Fig. 1A.** *Lymphangitic sporotrichosis on right upper extremity.*

**Fig. 1B.** *Sporotrichoid chancre, erythematous-violaceous lesion with necrotic center at the level of the back of right hand.*

After 7 days of incubation on Sabouraud's agar with and without antibiotic, the mycology laboratory reported the growth of a membranous, radiate, dark brown pigmented fungus (Fig. 2A), which microscopically revealed sympoduloconidia and thin filaments compatible with *Sporothrix spp*. (Fig. 2B).

**Fig. 2A.** *White, membranous, radiate and folded colony with melanocytic pigment compatible with Sporothrix spp.*

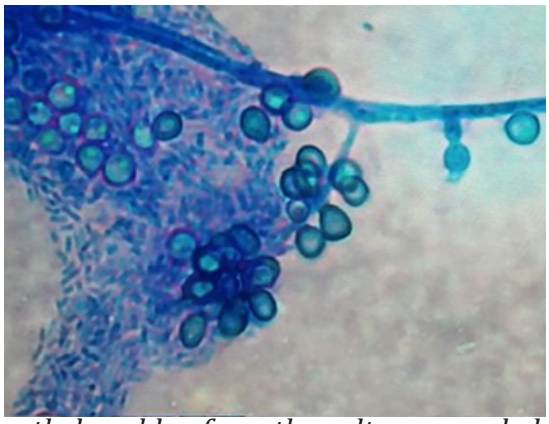

**Fig. 2B.** *Direct examination with methylene blue from the culture revealed a substantial quantity of sympoduloconidia organized into a "daisy-like configuration", accompanied by thin, branched filaments.*

Subsequently a fragment of the strain was transferred to the laboratory of microbiology and pathology of the University of Guadalajara to perform proteomic tests with MALDI-TOF having as causal agent *Sporothrix schenckii sensu stricto* with a score of 1.88 considering acceptable the identification at species level.

A post-mortem sample of the cat was sent to the microbiology laboratory to confirm that it was infected by *Sporothrix*. The same studies were performed as in the patient, and after seven days a colony with similar characteristics to those isolated in the patient was found, confirming *Sporothrix spp*. as the cause of both infections and the cat as the cause of the zoonosis (Fig. 3A, 3B).

**Fig. 3A.** *Feline with ulcerated lesions at the level of the face where the post-mortem sample was obtained.*

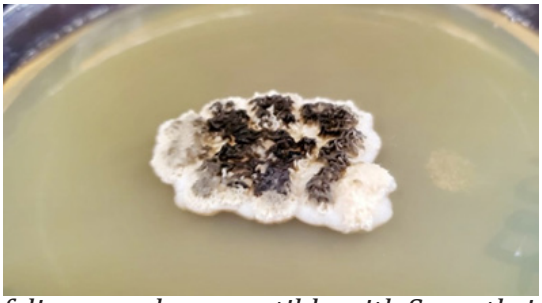

**Fig. 3B.** *Culture obtained from the feline sample compatible with Sporothrix spp.*

The cat strains were also sent to the microbiology and pathology laboratory of the University of Guadalajara to confirm the causative agent by MALDI-TOF, and the result was *Sporothrix schenckii sensu stricto* with a score of 1.9, corroborating the same species identified in the patient.

The patient was treated with itraconazole 200 mg twice daily for three months. 85% remission of the lesions was achieved, although some keloid scarring remained (Fig. 4A,4B).

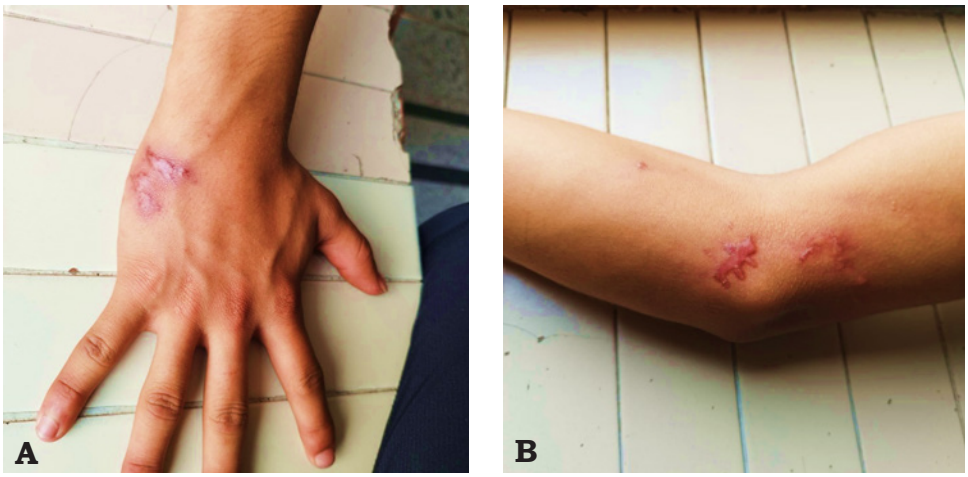


**Fig. 4A, 4B.** *Right dorsum and forearm of the patient after treatment with itraconazole 200mg twice daily. We observed an almost complete cure, with keloid scars remaining.*

## 3. Discussion

Sporotrichosis, a subcutaneous mycosis, is caused by the dimorphic fungus *Sporothrix schenckii* and related species. This fungus is found worldwide in vegetation, decaying organic matter, sphagnum moss, and soil. Sporotrichosis, a fungal pathology, is transmitted through traumatic inoculation of *Sporothrix* propagules into skin tissue. The classical route of transmission refers to sapronosis (i.e., from the environment to the warm-blooded vertebrate host). Consequently, it is classified as an occupational mycosis, frequently associated with trauma sustained during outdoor work in professionals such as gardeners, farmers, extractivists, and florists, among others. The alternative route of infection is linked to horizontal animal transmission, which predominantly affects domestic cats and armadillos. In the context of sporotrichosis, a disease transmitted by cats, these animals act as vectors for the spread of the disease by transmitting secretions through scratches and bites, or by direct contact with other cats. This process can lead to the emergence of epizootics or, directly, the transmission of the pathogen to humans (zoonosis) (4).

Cats are the most susceptible hosts to *Sporothrix* contamination and commonly develop the most severe forms of the disease, which can progress to death (5). Multiple ulcerative lesions are usually seen in the cephalic region, mainly in the nose and paw region, due to feline behavior involving scratching and biting during fights (5, 6, 7).

## 4. Conclusions

This study presents the third documented case of cat scratch sporotrichosis in Mexico. However, this number is estimated to be negligible when considered in the context of the population of the country in question and the prevalence of cats as domestic pets. Consequently, it is imperative to provide more training through awareness campaigns where the care of pets is promoted, to make this fungal pathology known to health personnel who are not familiar with it, in addition to promoting talks in health centers and congresses or symposiums where more and more health professionals, including dermatologists, microbiologists and veterinarians, join every day, thus improving the diagnosis of these zoonoses and optimizing patient care.

## References

1. Chakrabarti A, Bonifaz A, Gutierrez-Galhardo MC, et al. Global epidemiology of sporotrichosis. Med Mycol. 2015 Jan;53(1):3-14. doi: 10.1093/mmy/myu062. Epub 2014 Dec 19. PMID: 25526781.
2. World Health Organization, Esporotricosis. [internet], November 15, 2023, due: May 12, 2025. URL: https://www.who.int/es/news-room/fact-sheets/detail/sporotrichosis.
3. Alcocer-Salas M, Torres-Calderón MF, Rodríguez-Mena AC, et al. Esporotricosis cutánea fija trasmitida por un gato, segundo caso reportado en México. Dermatol Rev Mex 2025; 69 (1): 99-104.
4. Rodrigues AM, Gonçalves SS, de Carvalho JA, et al. Current Progress on Epidemiology, Diagnosis, and Treatment of Sporotrichosis and Their Future Trends. J Fungi (Basilea). 2022 Jul 26;8(8):776. doi: 10.3390/jof8080776. PMID: 35893145; PMCID: PMC9331723.
5. Gremião ID, Menezes RC, Schubach TM, et al. Feline sporotrichosis: epidemiological and clinical aspects. Medicine. Micol. 2015;53:15-21. doi: 10.1093/mmy/myu061.
6. Pereira SA, Gremião IDF, Menezes RC Sporotrichosis in Animals: Zoonotic Transmission. In: Zeppone Carlos I., editor. Sporotrichosis: New Developments and Future Perspectives. Springer International Publishing; Cham, Switzerland: 2015. pp. 83-102.
7. Pereira SA, Gremião ID, Kitada AA, et al. The epidemiological scenario of feline sporotrichosis in Rio de janeiro, Rio de janeiro State, Brazil. Rev. da Soc. De Med. tropo. 2014;47:392-393. doi: 10.1590/0037-8682-0092-2013.