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Sporotrichosis transmitted by domestic cats: A case report

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ABSTRACT

Sporotrichosis is a subacute to chronic subcutaneous mycosis caused by dimorphic fungi of the *Sporothrix* spp. complex.

It is considered the most frequent subcutaneous mycosis in Latin America and predominates in tropical areas. In Argentina, its prevalence is estimated at 0.01–0.02%. In half of the patients, it manifests as lymphocutaneous sporotrichosis.

Infection results from the agent's inoculation on the skin or mucous membrane by trauma with contaminated plants. There are also cases of zoonotic transmission by contact with animals, such as armadillos, birds, rats, horses, fish, mosquitoes, and cats.

Here we describe the case of a 14-year-old female patient who consulted due to nodular lymphangitic syndrome for two months and, given the lack of response to multiple antibiotic regimens, a biopsy was performed and a culture of the lesion was done, which confirmed the diagnosis of lymphocutaneous sporotrichosis.

***Keywords*:** Sporothrix schenkii*; lymphangitis; sporotrichosis.*

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INTRODUCTION

Sporotrichosis is a subacute or chronic infection caused by thermally dimorphic fungi of the genus *Sporothrix*. It is a cosmopolitan disease, occurring preferentially in tropical and subtropical regions, and is considered the most frequent subcutaneous mycosis in Latin America.[1]

For a long time, it was known as "rose mycosis" or "gardener's mycosis" because the infection usually resulted from fungus' inoculation on the skin or mucous membrane as a consequence of an injury caused by contaminated plant matter. However, zoonotic transmission through cat scratches or bites has been reported in recent years; in most cases, *S. brasiliensis* was isolated, which is the species with the highest known virulence.[2]

Patients with sporotrichosis present with cutaneous and subcutaneous involvement, although some patients may occasionally have disseminated forms.[3]

Sporotrichosis may occur at any age; however, it is more common in pediatric patients and young adults because these groups often have direct contact with these animals.

Here we report the case of a 14-year-old female patient who presented with nodular lymphangitic syndrome after being bitten by her pet (a domestic cat); the diagnosis of lymphocutaneous sporotrichosis was confirmed based on positive cultures.

CASE REPORT

An otherwise healthy 14-year-old female patient consulted due to dermatosis for the past two months, located on her right upper limb. The case history noted she had been hospitalized in another facility, where she received multiple antibiotic regimens without improvement.

According to the patient, the dermatosis began with a scabby-erythematous nodule on the inner aspect of her right arm and lesions of similar characteristics developed and spread in a linear distribution towards her axilla (*Figures 1* and *2*).

Figure 1. Lymphangitic sporotrichosis in the upper limb showing nodules in different evolutionary stages, following a typical linear distribution (sporotrichoid pattern) towards the axilla

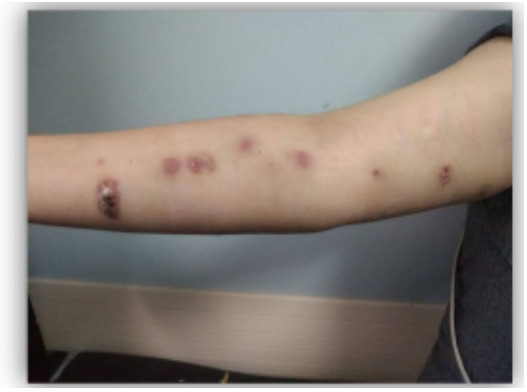
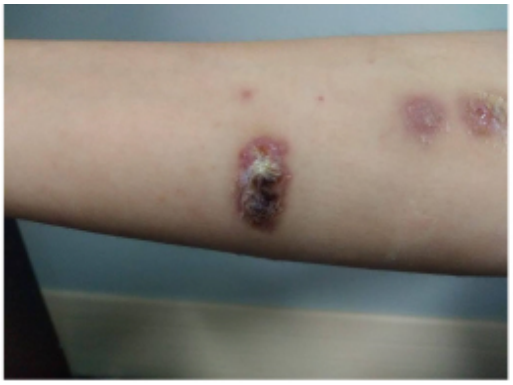


Figure 2. Initial scabby lesion on forearm with central ulceration



The following supplementary tests were done: hemogram, which showed slight leukocytosis; blood cultures, which were negative; and serologies for human immunodeficiency virus (HIV), hepatitis B virus (HBV), toxoplasmosis, VDRL, *Bartonella henselae*, Epstein-Barr virus (EBV), and cytomegalovirus (CMV), which were negative. A PPD skin test and a chest X-ray were also done; both were unremarkable.

Due to the lack of clinical response, she consulted our service. The dermatologic examination showed nodular lymphangitic syndrome accompanied by regional lymphadenopathies that were painless, small, mobile, and not adherent to deep planes.

During history-taking, it was noted that the patient had a cat as a domestic pet and that she was often scratched and bitten when playing.

A biopsy was performed for pathological examination and cultures for common microorganisms, mycobacteria, and fungi.

The material was seeded in Sabouraud agar at 28 °C and 37 °C and was positive for *S. shenkii*. At 37 °C, the yeast-like parasitic form was obtained, while, at 28 °C, the saprophytic phase characterized by hyaline branched hyphae and globose conidia was evidenced.

Neither serology nor molecular biology methods are routinely available for diagnosis.

The histology showed a cutaneous section with lymphoplasmacytic and histiocytic inflammatory process of perivascular, superficial perianexial, and deep perivascular disposition.

The cat was referred to the Zoonosis Department of the School of Veterinary Sciences; it had lesions on the snout and hind legs. The diagnosis of *S. shenkii* was also confirmed (*Figure 3*).

With a confirmed diagnosis of sporotrichosis transmitted by a domestic cat, treatment was started with itraconazole at 200 mg/day for 6 months, with a favorable course. A clinical response was observed 2 months after starting treatment. The patient's liver function tests at 1 month, 3 months, and at the end of treatment were all unremarkable. At the time of publication of this article, the patient is being treated for residual hypertrophic scars with a good response.

DISCUSSION

The different species that define the *Sporothrix* spp. complex differ in their geographic distribution and microbiological characteristics; *S. brasiliensis* and *S. schenkii* are the most virulent species.[2] They are widely distributed worldwide, especially in cellulose-rich soils of tropical and subtropical areas.

Some authors suggest that felines are particularly susceptible to infection by this species.[3] In these cases, infection in humans occurs after contact with lesions, bites, or scratches from sick felines.[3]

The clinical manifestations depend on the host's immune response, the virulence of the strain, and the size of the inoculum. The clinical

Figure 3. Ulcerated, scabby lesions on the face and leg of the cat

manifestations are divided into cutaneous and extracutaneous;[2,3] however, new classification systems have been proposed (*Table 1*).

The following are the most common clinical forms:

Lymphocutaneous or lymphangitic sporotrichosis: it accounts for more than 75% of cases; it develops on exposed skin, such as hands, face, and feet. The incubation period is 15 to 30 days; an erythematous or violaceous, non-painful nodule appears at the site of inoculation, which subsequently ulcerates (sporotrichous chancre). Lymphangitis occurs accompanied by secondary nodules which may also ulcerate, known as sporotrichoid pattern or nodular lymphangitis. The general condition is usually unaffected.

Fixed or dermoepidermal sporotrichosis: (it accounts for 10–30% of cases) it manifests with only 1 lesion. The infection is limited and usually manifests as a slow-growing, less progressive verruciform plaque with minimal or no lymphatic involvement.

The differential diagnoses include mycobacterial, *Nocardia* spp., *Leishmania braziliensis*, *Coccidioides immitis*, *Coccidioides posadasii*, *Blastomyces dermatitidis*, *Staphylococcus aureus* and *Histoplasma capsulatum* infections.

The gold standard for making a diagnosis of sporotrichosis is the isolation and identification of *Sporothrix* spp. in biopsies of skin lesions and other affected tissues.[2] The definitive diagnosis requires the mycelial- to yeast-phase transition, which is achieved by the sub-culture on enriched media at temperatures of 28 °C and 37 °C. In its saprophytic phase (25–28 °C), it grows in its filamentous form, which on microscopic examination shows the presence of thin septate hyaline hyphae. The conidiophores are long and thin, and from them are born simple, hyaline, oval, or elongated conidia arranged as a bouquet. In the gross examination, it appears as a creamy-white colony that, with time, becomes darker on media such as Sabouraud agar, and requires at least 5 to 7 days for its growth. The yeast form is obtained by culture in enriched media at 35–37 °C in both filamentous and yeast forms.[4]

Sporotrichosis does not resolve spontaneously and the treatment of choice consists of itraconazole at 3–5 mg/kg/day for 3 to 6 months with an adequate tolerance and low relapse rate (clinical response time: 2–3 months).

Itraconazole is a fungistat that acts by inhibiting the synthesis of ergosterol in the fungal cell wall. Itraconazole can be used systemically in healthy patients with limited lesions and in immunocompromised patients, but not in life-threatening cases of dissemination/sepsis. Its presentation is 100 mg capsules that should be taken before or after a meal.

The main adverse effects reported are headache, gastrointestinal disorders, and photosensitivity. Itraconazole is hepatotoxic, teratogenic, and embryotoxic. It should not be used in patients with liver disease or in pregnant women. Liver function tests should be performed before treatment and after 3–4 weeks. If serum

Table 1. Clinical classification of sporotrichosis[1]

Skin	Lymphocutaneous Fixed cutaneous Multiple inoculation
Mucous membrane	Ocular Nasal Other
Systemic	Osteoarticular Cutaneous disseminated Pulmonary Neurological Other locations/sepsis
Immunoreactive	Erythema nodosum Erythema multiforme Sweet's syndrome Reactive arthritis
Spontaneous regression	-

levels are within normal ranges, tests should only be repeated at the end of treatment.

For patients with contraindications to itraconazole, the indicated treatment is a saturated solution of potassium iodide at 1–2 g/day (mixed in milk or juice) administered 3 times a day. Lesions tend to resolve in 2 to 4 weeks.[5]

In severe cases, deoxycholate or preferably liposomal amphotericin B is used at 0.025–1 mg/kg/day until clinical improvement is achieved and then the regimen is rotated to itraconazole.

At present, sporotrichosis should be considered an emerging zoonotic disease and should be suspected in all healthy hosts in the presence of ulcerated, painless skin nodules with non-purulent discharge and delayed healing. The topography with lymphatic dissemination and the history of environmental exposure or pet carriers, especially felines, are crucial elements for an accurate diagnosis. ■

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