Residência RP Pediátrica
Publicação Oficial da Sociedade Brasileira de Pediatria
ISSN-Online: 2236-6814

Submitted on: 02/10/2025
Approved on: 04/28/2025

CASE REPORT

Sporotrichosis with Nervous System Involvement in an Immunocompetent Pediatric Patient: A Case Report

Barbara de Miranda Schmitz[1], Rafaela Gomes Dadda[1], Raphaela Maintinguer[1], Bruna Cararo Machado[2], Bruna da Costa[2], Carine Machado Pereira[2], Carolina Galhós de Aguiar[3], Elson Julius Shockness[4], Andrew Bonifácio Ferreira[4], Melina Moré Bertotti[5], Emanuela da Rocha Carvalho[6,7]

Keywords:
Meningitis,
Invasive Fungal Infections,
Mycosis Fungoides.

Abstract

A previously healthy male preschooler was referred to a pediatric hospital with suspected meningitis and intracranial hypertension after presenting headache, vomiting, and dizziness. He was afebrile. A cranial tomography scan confirmed hydrocephalus, and cerebrospinal fluid analysis suggested meningeal tuberculosis. A ventriculoperitoneal shunt was performed, and tuberculosis treatment was started. The patient returned with catheter obstruction, abdominal pain, and fever. An abdominal tomography showed a cerebrospinal fluid cyst, which was drained and sent for analysis, identifying *Sporothrix*. HIV serology was negative. The mother later confirmed contact with cats. Tuberculosis treatment was stopped, and the patient received amphotericin B for 6 weeks, followed by itraconazole for 12 months. Hospitalization was prolonged due to multiple shunt revisions and infective endocarditis caused by *Streptococcus* oralis due to poor dental health.

[1] Universidade Federal de Santa Catarina, Acadêmica Graduação em Medicina - Florianópolis - Santa Catarina - Brazil.
[2] Hospital Infantil Joana de Gusmão, Residente Pediatria - Florianópolis - Santa Catarina - Brazil.
[3] Hospital Universitário Polydoro Ernani de São Thiago - UFSC, Residente Radiologia - Florianópolis - Santa Catarina - Brazil.
[4] Hospital Governador Celso Ramos, Residente Neurocirurgia - Florianópolis - Santa Catarina - Brazil.
[5] Hospital Infantil Joana de Gusmão, Médica Neurocirurgiã - Florianópolis - Santa Catarina - Brazil.
[6] Universidade Federal de Santa Catarina, Docente Pediatria - Florianópolis - Santa Catarina - Brazil.
[7] Hospital Infantil Joana de Gusmão, Infectologista Pediatra - Florianópolis - Santa Catarina - Brazil.

Correspondence to:
Emanuela da Rocha Carvalho.
Universidade Federal de Santa Catarina. R. Profa. Maria Flora Pausewang - Trindade, Florianópolis - SC, Brazil - 88036-800. E-mail: manucarvalhoped@gmail.com

DOI: 10.25060/residpediatr-2026-1429

Creative Commons. Attribution-NonCommercial-ShareAlike 4.0 International.

INTRODUCTION

Sporotrichosis is a granulomatous disease caused by fungi of the genus *Sporothrix*, which are found in soil and endemic to tropical and subtropical areas[1]. Infection mainly occurs through the inoculation of the fungus into traumatized skin or mucosa from accidents with contaminated material or scratches from sick animals, witch cats are the primary transmitters, characterizing this disease as zoonotic[2]. Normally, the infection is limited to the skin and regional lymph nodes. After a variable incubation period, a papulonodular lesion appears at the site of pathogen inoculation, called sporotrichotic chancre, with potential ulceration. Consequently, extracutaneous involvement may occur due to lymphatic or hematogenous spread of the local disease[1]. Thus, factors such as the mode of inoculation, the size of the traumatic inoculum, the host's immunity and the virulence of the fungus contribute to a varied clinical spectrum of this mycosis[3].

Central nervous system (CNS) involvement in sporotrichosis can present as part of a disseminated disease or as isolated chronic meningitis[2] and, in both cases, the gold standard for the diagnosis is the isolation of *Sporothrix* in clinical specimens - in the case of CNS involvement, from cerebrospinal fluid (CSF). However, the low cellularity of the pathogen in CSF as well as the long time for the fungus to grow in culture (averaging 4 weeks), contributes to the negativity of the test and the difficulty of the diagnosis[4].

Knowing this, due to the rarity of the disease, there are few reported cases of sporotrichosis in the central nervous system. Oliveira et al (2024), in a systematic review, found 52 cases of CNS sporotrichosis published between 1966 and 2023. Of these, 46 were men with a mean age of 39 years, 85% of the cases were individuals immunocompromised by HIV, and 32 cases were from Brazil[5].Unlike this review, in this case report (CAAE 80222124.4.0000.5361), we describe a rare case of central nervous system sporotrichosis in a pediatric and immunocompetent patient, with an initial diagnosis of meningeal tuberculosis refractory to empirical treatment who, after multiple hospitalizations and complications, had a microbiological diagnosis of CNS sporotrichosis.

CASE REPORT

T.G., a 4-year-old male, was referred to the pediatric emergency room due to severe headache associated with vomiting and vertigo. He reported no fever or seizures. A computed tomography (CT) scan of the skull was performed, with a report of moderate dilation of the ventricular system and mild diffuse effacement of the cerebral sulci. A lumbar puncture (LP) was also performed, and the result showed a clear cerebrospinal fluid (CSF) with slightly increased opening pressure, moderate cellularity with a predominance of lymphomononuclear cells, hypoglycorrhachia, and hyperproteinorrhachia. Since bacterial meningitis could not be ruled out, empirical ceftriaxone was started.

When discussing the case with pediatric neurology, the main diagnostic hypothesis of meningoencephalic tuberculosis (TB) was raised. Thus, after notification as a suspected case of neuro TB, a CSF sample was sent for evaluation with rapid molecular testing, acid-fast bacilli (AFB), culture and adenosine deaminase (ADA). The patient was admitted to the intensive care unit with empirical treatment for CNS tuberculosis (rifampicin, isoniazid and pyrazinamide), associated with prednisone, and underwent neurosurgical management for hydrocephalus correction with ventriculoperitoneal shunt (VPS) placement. After stabilization, the patient was discharged with instructions to return if alarm symptoms appeared.

In the same week, due to obstruction of the VPS, the patient returned to the hospital with the same clinical picture. A new LP was performed, with maintenance of the pattern, as well as a new CT scan, showing hypertensive hydrocephalus (Figure 1). It was decided to remove the VPS and perform right VPS instead. The patient was discharged one week later.

A month later, the patient was referred again due to abdominal pain, fever and vomiting. An abdominal CT scan performed at the referring hospital revealed a CSF cyst related to the VPS (Figure 2). CSF cyst drainage was performed by laparoscopy, followed by a ventriculopleural shunt.



Figure 1. Axial section of a non-contrast cranial tomography, which demonstrates hydrocephalus, noting the VPS catheter in the posterior horn of the right lateral ventricle.

The patient remained hospitalized complaining of abdominal pain, with suspected peritoneal tuberculosis due to abdominal CT findings of numerical prominence of mesenteric lymph nodes in the left external iliac chain and foci of calcified density in intestinal loops - which, associated with a history of neuro-TB, corroborated the clinical suspicion - although

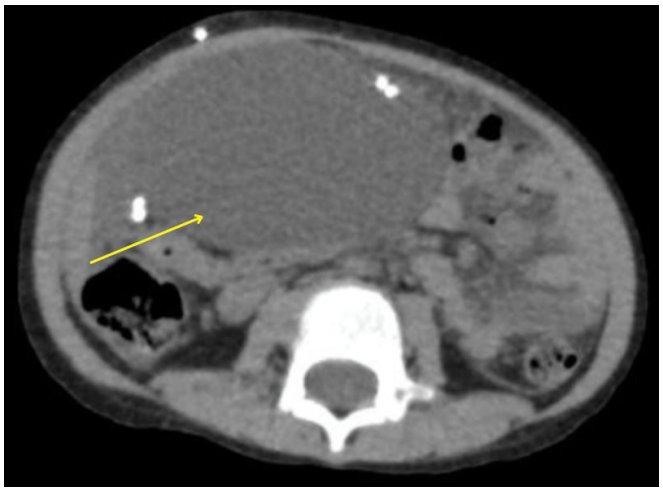


Figure 2. Axial section of a non-contrast abdominal tomography, which demonstrates a voluminous fluid collection in the right hypochondrium and encompassing a VPS catheter, compatible with a cerebrospinal fluid pseudocyst.

the patient was undergoing anti-tuberculosis treatment with excellent adherence. However, culture of the abdominal CSF cyst indicated *Sporothrix* growth, leading to the final diagnosis of CNS sporotrichosis. Therefore, CNS tuberculosis treatment was discontinued, and therapy with liposomal amphotericin B was initiated for 6 weeks, followed by itraconazole treatment for at least 12 months.

After a prolonged hospitalization with multiple complications and, finally, diagnostic clarification with microbiological confirmation and effective treatment, the patient was discharged with prescriptions for itraconazole and referred for outpatient follow-up.

DISCUSSION

Sporotrichosis is a disease with a broad clinical spectrum due to factors such as the mode of inoculation, the size of the traumatic inoculum, the host's immunity and the virulence of the fungus. Among the representatives of the *Sporothrix* genus in Brazil, the species *S. brasiliensis* is the most prevalent[6,7]. This species produces large quantities of urease and melanin, which are virulence factors that facilitate penetration into tissues and evasion of the immune system, resulting in dissemination to different organs, including the central nervous system.

The classically described clinical picture involves the appearance of the sporotrichotic chancre without causing systemic symptoms[6]. Subsequently, depending on the factors previously mentioned, sporotrichosis can present in a local or disseminated form[3]. In immunocompetent individuals, most *Sporothrix* infections are local, with extracutaneous involvement occurring mainly through hematogenous dissemination in immunocompromised individuals[4,7].

Through research carried out by the authors in the main databases, in the last 10 years, only 11 reported cases of disseminated sporotrichosis with CNS involvement were found, of which only 4 occurred in immunocompetent individuals and none in the pediatric age group. Therefore, this report, which describes a case of disseminated sporotrichosis with CNS involvement in an immunocompetent pediatric patient, is the first of its kind.

As it is a rare clinical entity outside the spectrum of immunosuppression, fungal meningitis requires a high index of clinical suspicion for adequate diagnosis and treatment, since delays in these stages are present in most patients who do not achieve a cure - which may result from incorrect initial diagnosis due to the pleomorphic presentations of sporotrichosis[4]. In addition to the lack of knowledge of *Sporothrix* as a cause of meningitis, diagnosis may be delayed in cases of isolated CNS disease due to the difficulty in recovering the organism from the CSF. Culture is considered the gold standard for diagnosis; however, growth may take up to 1 month and paucicellularity in immunocompetent individuals contributes to its negativity.

Furthermore, in order to make the diagnosis even more difficult, the CSF profile in Sporothrix infection usually demonstrates moderate pleocytosis with a predominance of lymphocytes, low levels of glucose and high levels of protein - which is also compatible with CNS tuberculosis[4]. Thus, neurotuberculosis is the main differential diagnosis, as it is the most prevalent cause of chronic meningitis in the world, especially in endemic regions such as Brazil, in addition to having similar clinical and radiological characteristics. The diagnosis of neurotuberculosis is also challenging and many patients are treated empirically - which also occurred in this case report, in which TB treatment was initiated until the final diagnosis of sporotrichosis was obtained.

After this, treatment was carried out according to the recommended regimen of amphotericin B for 4 to 6 weeks, which, despite its limiting toxic potential, is the only intravenous antifungal available to treat severe sporotrichosis[4], followed by gradual reduction therapy with itraconazole for 12 months[4,6], thus achieving clinical and microbiological success.

In resume, this report illustrates a late diagnosis of CNS sporotrichosis after fungal culture in the analysis of an abdominal cerebrospinal fluid cyst originating from a ventriculoperitoneal shunt in an immunocompetent patient with no history of skin lesions initially reported. In this case, in addition to analyzing the CSF with fungus research, a detailed anamnesis was carried out, in order to look for epidemiological

history compatible with the clinical presentation presented by the patient. Thus, evidence of frequent contact with stray cats with skin lesions similar to sporotrichotic cancers was found, helping to broaden the diagnostic hypotheses and contributing to a faster diagnosis, avoiding new complications.

Despite the good results achieved in this case, it is known that sporotrichosis is considered a neglected tropical disease by the World Health Organization,[4] since it receives little investment in research, treatment and prevention, as well as by the medical profession, which often does not consider this disease as a possibility for differential diagnosis. Therefore, physicians must consider Sporothrix as a possible agent of meningitis even in immunocompetent patients, especially when the pacient doesn't respond to standard empirical therapy - since favorable clinical results depend on a rapid diagnosis and early initiation of antifungal therapy.

BIBLIOGRAPHICAL REFERENCES

1. de Oliveira VF, Petrucci JF, Taborda M, Brener PZ, Kremer PGBB, Randi BA, et al. Clinical characteristics, diagnosis, and treatment of central nervous system sporotrichosis: Systematic review and meta-analysis. Mycoses. 2024 Feb;67(2):e13697. doi: 10.1111/myc.13697. PMID: 38374494.
2. Freitas DF, Lima MA, de Almeida-Paes R, Lamas CC, do Valle AC, Oliveira MM, et al. Sporotrichosis in the Central Nervous System Caused by Sporothrix brasiliensis. Clin Infect Dis. 2015 Aug 15;61(4):663-4. doi: 10.1093/cid/civ361. Epub 2015 May 8. PMID: 25956895. https://doi.org/10.1093/cid/civ361
3. Mahajan VK. Sporotrichosis: an overview and therapeutic options. Dermatol Res Pract. 2014;2014:272376. doi:10.1155/2014/272376
4. Fichman V, Freitas DFS, do Valle ACF, de Souza RV, Curi ALL, Valete-Rosalino CM, de Macedo PM, Varon AG, Figueiredo-Carvalho MHG, Almeida-Silva F, et al. Severe Sporotrichosis Treated with Amphotericin B: A 20-Year Cohort Study in an Endemic Area of Zoonotic Transmission. Journal of Fungi. 2022; 8(5):469. https://doi.org/10.3390/jof8050469
5. Oliveira MME, Muniz MM, Almeida-Paes R, Zancope-Oliveira RM, Freitas AD, Lima MA, Gutierrez-Galhardo MC, Freitas DFS. Cerebrospinal fluid PCR: A new approach for the diagnosis of CNS sporotrichosis. PLoS Negl Trop Dis. 2020 Jul 16;14(7):e0008196. doi: 10.1371/journal.pntd.0008196. PMID: 32673308; PMCID: PMC7365394. https://doi.org/10.1371/journal.pntd.0008196
6. Kauffman CA. Central Nervous System Infection with Other Endemic Mycoses: Rare Manifestation of Blastomycosis, Paracoccidioidomycosis, Talaromycosis, and Sporotrichosis. J Fungi (Basel). 2019;5(3):64. Published 2019 Jul 18. doi:10.3390/jof5030064
7. Lima MA, Vallier R, Silva MM. Sporothrix brasiliensis meningitis in an immunocompetent patient. Practical Neurology. 2021;21(3):241-242. doi:https://doi.org/10.1136/practneurol-2020-002915