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Sporotrichosis: Spectrum and Complications

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ABSTRACT

Sporotrichosis, a fungal infection caused by the Sporothrix genus, predominantly presents as cutaneous disease following inoculation through minor skin trauma. Environmental exposure, often linked to soil, plants, or infected animals, is a common source of acquisition. The spectrum of the disease ranges from localized skin lesions to severe disseminated forms, with manifestations including osteoarticular involvement and rare occurrences of meningitis. Prompt diagnosis, typically achieved through culture, is vital for effective management. Treatment, primarily employing antifungal agents like amphotericin B and itraconazole, is essential, as spontaneous resolution is rare. The prognosis varies, with localized infections responding well to treatment, while extracutaneous forms, especially in immunocompromised individuals, may lead to complications and poorer outcomes. Meningitis poses a significant challenge due to limited therapeutic options and diagnostic complexities.

KEYWORDS: Sporotrichosis, fungal infection, cutaneous disease, environmental exposure, antifungal therapy, osteoarticular involvement, disseminated disease, meningitis, immunocompromised, diagnosis.

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INTRODUCTION

Sporotrichosis is a chronic fungal infection caused by the Sporothrix genus, typically manifesting as cutaneous disease following the inoculation of the organism through minor skin trauma or puncture from contaminated sources like soil, plants, hay, or infected cats [1-3]. The condition is more prevalent in tropical and subtropical climates [3]. The lymphocutaneous form presents with an indolent papulonodular lesion at the inoculation site, eventually ulcerating, with secondary lesions mimicking the primary one developing along lymphangitic channels [4]. In the fixed cutaneous form, common in children, a papulonodular lesion occurs at the inoculation site without the development of secondary lesions [3]. Extracutaneous disease is more common in immunocompromised individuals, with focal or disseminated involvement in various organs [5].The gold standard for diagnosis involves culture and isolation of the organism [6]. Amphotericin B is the initial drug of choice for disseminated or systemic cases, especially those involving the central nervous system, with a preference for the lipid formulation. Itraconazole is the preferred antifungal for lymphocutaneous, cutaneous, and most joint infections, often used as step-down therapy after amphotericin B [7]. Localized infections respond well to treatment, but without intervention, lesions may persist. Osteoarticular disease, while not life-threatening, can impair joint function, and extracutaneous forms carry a higher mortality risk [8]. Overall, early diagnosis and appropriate antifungal therapy are crucial for effective management of sporotrichosis [6-8].

Figure 1. Sporothrix schenckii growth on SDA: After 7 days at 25°C, forming filamentous hyaline colonies which becoming dark at the center as the culture ages

COMPLICATIONS

Complications arising from sporotrichosis can manifest as secondary outcomes due to the dissemination of the infection from the primary site, whether apparent or hidden. Osteoarticular infection, a common complication, is more prevalent in individuals with underlying alcohol dependence.

The infection can result from hematogenous dissemination or contiguous spread following local inoculation, potentially affecting single or multiple joints. Commonly involved joints include the knees, elbows, wrists, and ankles, while the presence of hip, shoulder, or spine involvement may suggest an alternative diagnosis. Osteomyelitis may develop as a consequence of local spread from an infected joint and could lead to granulomatous tenosynovitis and bursitis [8].

Specific anatomical regions may be affected, such as extensor tendon tenosynovitis in the hand with or without tendon rupture, flexor tenosynovitis in the wrist associated with carpal tunnel syndrome, and olecranon bursitis. Despite the uncommon occurrence of systemic symptoms, infections are typically chronic. Most patients present without a known history of sporotrichosis at another site. A notable challenge is the significant delay in reaching a definitive diagnosis, often necessitating repeated culture of joint fluid and multiple synovial biopsies to establish a conclusive diagnosis [8, 9].

Meningitis is a rare occurrence in sporotrichosis, predominantly observed as part of disseminated disease in individuals with cellular immunocompromise. However, it can also manifest as an isolated chronic infection in non immunosuppressed patients. The onset of meningitis is generally indolent, and approximately half of the patients present with concurrent skin lesions. Positive culture results for cerebrospinal fluid are typically observed, but obtaining multiple samples or large-volume samples may be necessary for confirmation. Cerebrospinal fluid serology can serve as an additional diagnostic tool [10, 11].

Widespread disseminated systemic infection is a rare phenomenon and is more likely to occur as an opportunistic infection in patients with cellular immunocompromise, such as those with AIDS with low CD4 lymphocyte counts, transplant recipients, or individuals receiving chemotherapy, corticosteroid, or tumor necrosis factor antagonists. This form of infection usually presents as disseminated cutaneous disease, fungemia, disseminated visceral disease, or multifocal extracutaneous disease. In some cases, it can be a manifestation of immune reconstruction inflammatory syndrome after the initiation of highly active antiretroviral therapy in AIDS patients. Serum serology may provide additional assistance in diagnosis [12].

While uncommon, there is a possibility of relapse or recurrence of the infection, particularly after the cessation of therapy. Immunocompromised patients, especially those treated for extracutaneous disease, are at the highest risk for relapse [10].

PROGNOSIS

The prognosis for sporotrichosis generally indicates a requirement for treatment, as spontaneous resolution of the disease is rare. If left untreated, ulcerative lesions can persist for years, and there may be intermittent periods of apparent healing followed by a flare in manifestations. However, treatment for localized infection, primarily affecting the skin and subcutaneous tissue, is highly effective, with an overall response rate to itraconazole exceeding 90% for cutaneous and lymphocutaneous disease [13].

In cases of extracutaneous disease, the prognosis varies. Osteoarticular infection is associated with a poor outcome in terms of joint function, although it is not life-threatening. High mortality rates are linked to other extracutaneous forms of the disease, including pulmonary infection, where outcomes are often unfavorable due to underlying comorbidities such as alcohol dependence and chronic obstructive pulmonary disease, along with delays in diagnosis. Disseminated infection, encompassing disseminated cutaneous disease, fungemia, and disseminated visceral disease, tends to have a poor prognosis, largely due to underlying immunocompromise and the extent of the disease [10-12].

Meningitis, a rare but severe complication, presents a poor outcome primarily because of limited treatment options, comorbid immunodeficiency in patients, and the inherent difficulty in establishing a timely diagnosis of meningeal sporotrichosis [10, 11].

CONCLUSION

Sporotrichosis is a fungal infection caused by the Sporothrix genus, typically presenting with cutaneous disease after inoculation through minor skin trauma. The acquisition is associated with environmental exposure, and the disease may manifest in various forms, ranging from localized skin lesions to severe disseminated infections. Prompt diagnosis, often through culture, is crucial for effective management.

Treatment, particularly with antifungal agents like amphotericin B and itraconazole, is essential for most cases, especially considering the rarity of spontaneous resolution. The prognosis varies depending on the extent and form of the disease. While localized infections generally respond well to treatment, extracutaneous forms, such as osteoarticular or disseminated disease, can lead to complications and poorer outcomes, particularly in immunocompromised individuals. Meningitis, although rare, poses a serious challenge due to limited treatment options and difficulties in diagnosis.

Overall, early detection, appropriate antifungal therapy, and consideration of underlying immunocompromising conditions are crucial elements in achieving favorable outcomes in sporotrichosis.

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