



Case Report

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Black Mold: A Case Presentation and Discussion of Cutaneous *Stachybotrys chartarum* Infection

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Abstract

Stachybotrys chartarum, also known as black mold, is a type of indoor fungus that grows in areas of high moisture and humidity. At high rates of growth, the fungus can produce mycotoxins that become airborne and inhaled. More often than not, inhalation of significant amounts of black mold causes pulmonary mycotoxicosis. Here we present a case of a cutaneous black mold infection of the scalp in an 80-year-old male with no history of pulmonary mycotoxicosis with *Stachybotrys chartarum*. This case is presented because it illustrates the rare incidence of *Stachybotrys chartarum* in the context of a cutaneous infection rather than pulmonary mycotoxicosis. This type of fungus is difficult to culture and takes time to grow. It is important for physicians to be aware of its potential occurrence in patients with cutaneous infections because treatment is much more rigorous than that of simple bacterial skin infections. Recognition of this fungal growth early on can help patients get treated with the necessary medications before extensive spread of the mold can occur.

Keywords

Black mold, *Stachybotrys chartarum*

Introduction

Stachybotrys chartarum, more commonly known as black mold, is a type of indoor fungus that grows in areas of high moisture and humidity [1]. It is also known as *Stachybotrys atra* and *Stachybotrys alternans*. The striking green-black color is a result of dark melanin pigment produced by the fungus. Figure 1 illustrates the appearance of the mold in the environment [2].



Figure 1: *Stachybotrys chartarum* growth on the wall of an indoor building (Centers for Disease Control and Prevention).

Black mold can be found in soil and grains but is most common in damp buildings [3]. It has a high affinity for cellulose-rich environments, which explains why this fungus is difficult to culture on standard media. Additionally, it takes longer to grow than more common fungi, such as *Aspergillus* spp. or *Rhizopus* spp [4]. Unless a culture media is cellulose-rich, *S. chartarum* is often taken over by other types of fungi. Figure 2 shows a culture of *Stachybotrys* that was obtained from a contaminated wall [5].

At high rates of growth, the fungus can produce mycotoxins that become airborne and inhaled. Inhalation of significant amounts of black mold causes pulmonary mycotoxicosis. Patients present with flu-like symptoms that include fever, chills, nausea, cough, dyspnea, headache and myalgia [5]. Infections are usually self-limited, requiring only supportive care [5]. Here we present a case of cutaneous *S. chartarum* infection during which the patient did not develop any

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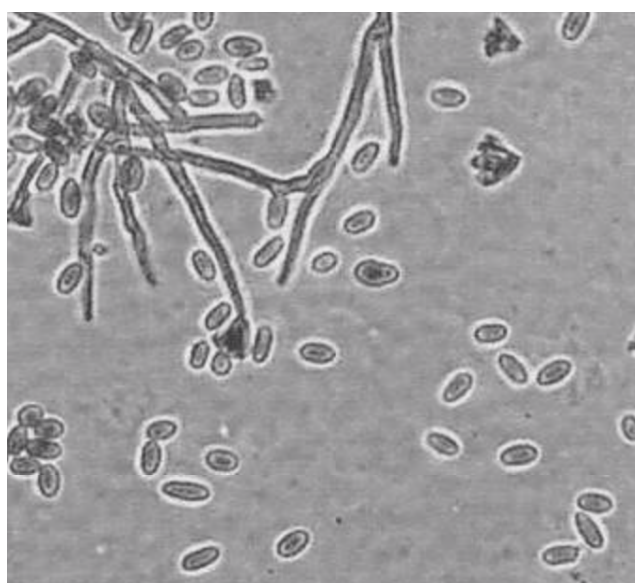


Figure 2: Culture of *Stachybotrys* at 40x [5].

pulmonary symptoms. This case report highlights the rarity of cutaneous black mold infection and delves into methods of diagnosis and standards of treatment.

Case Presentation

Here we present a case of a cutaneous black mold infection of the scalp in an 80-year-old immunocompetent male with no history of pulmonary mycotoxicosis with *Stachybotrys chartarum*. The patient presented with a subcutaneous nodule on his temporal scalp area that had been growing for the past few weeks. At the time, differential diagnoses included lipoma, abscess or malignancy. Imaging of the head revealed extensive skin involvement with potential extension to the dura so emergent surgery was performed to remove the mass and determine a histopathological diagnosis. The patient was treated with antibiotics due to a concern of *Staphylococcus aureus* infection. However, after a 10-day culture of the excised area, black mold began to grow on standard culture media. The patient was brought back in for further debridement involving wider margins in order to ensure no more fungus was left behind. He was placed on a year-long treatment regimen consisting of amphotericin B and was discharged for follow-up in outpatient clinic.

Discussion

This case is presented because it illustrates the rare incidence of *Stachybotrys chartarum* in the context of a cutaneous infection rather than pulmonary mycotoxicosis. In our case, the differential diagnoses list included *Staphylococcus aureus* infection. Continuing to treat the patient with antibiotics would not have resulted in resolution of symptoms. Rather, the infection could have extended into the dura, warranting much more extensive treatment.

This type of fungus is difficult to culture and takes time to grow. A more evolving approach for diagnosis of fungal infections is DNA sequencing. This can be utilized to make a diagnosis more quickly when there is a high index of clinical

suspicion. However, this can be difficult because other fungi also produce dark melanin pigment but do not produce mycotoxins. The term black mold simply refers to the black appearance of the mold as it grows in the environment.

The most common indoor fungi include *Alternaria*, *Aspergillus*, *Cladosporium*, and *Penicillium* [6]. The incidence of *Stachybotrys* is far less common. The mold preferentially grows in cellulose-rich environments with low nitrogen. This type of environment can be found surrounding material such as fiberboard, dust, paper, and lint [6]. Additionally, the mold requires moisture for growth so water damage to any of the aforementioned material will provide the perfect environment for growth of *Stachybotrys*.

In addition to treating fungal infections, it is also important to counsel patients on management of the fungus source so that they are not re-infected. First and foremost, the Centers for Disease Control and Prevention (CDC) recommends that patient clean the moldy surface with commercial products or a water-bleach solution [6]. In cases of extensive mold growth, professionals should be contacted. In order to prevent regrowth, the CDC highlights keeping humidity low by using air conditioners or dehumidifiers [6]. Additionally, mold-inhibitors or mold-killers can also be used [6].

It is important for physicians to be aware of potential *Stachybotrys* etiology in patients with cutaneous infections because treatment is much more rigorous than that of simple bacterial skin infections. Nevertheless, *S. chartarum* infection is still treatable with a prolonged course amphotericin B. Recognition of this fungal growth early on can help patients get treated with the necessary medications before extensive spread of the mold can occur.

Conflicts of Interest

The authors have no conflicts of interest to declare.

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