Cutaneous coccidioidomycosis presenting as a facial rash

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Abstract

Coccidioidomycosis is a fungal infection caused by the inhalation of Coccidioides immitis *and* Coccidioides posadasii *spores. After inhalation, the infection can spread hematogenously or through lymphatics to any organ, so the clinical presentation of coccidioidomycosis can vary greatly. A 38-year-old man with obesity was referred to an infectious disease clinic due to a cutaneous coccidioidomycosis infection of his face. The patient initially presented to his primary care physician with symptoms of fatigue, knee pain, and a facial rash that had persisted for a couple of months. Initial treatment involved a course of oral antibiotics, yielding no improvement. Subsequently, the patient sought evaluation at a dermatologist's office for multiple lesions on his face and scalp. Another round of oral antibiotics and topical mupirocin ointment was prescribed. The lesions were biopsied, and a culture tested positive for* Coccidioides immitis*. He was then referred to infectious disease for management.*

The physical examination revealed a scaling, erythematous rash located on the right cheek, forehead, and scalp. Vital signs were normal. A chest computed tomography was positive for multiple pulmonary nodules consistent with a history of coccidioidomycosis infection. Laboratory results revealed a cocci IgM titer of 1.2, IgG titer of 8.8, and an antibody by complement fixation titer of 1:128. The patient was started on oral fluconazole 200 mg daily, which was later increased to 400 mg twice daily. The patient began to show improvement in his skin lesions. We report an unusual presentation of cutaneous coccidioidomycosis as a facial rash. Clinicians, especially in endemic areas, should be aware of the differing presentations of Coccidioides *infections.*

Keywords: Cutaneous coccidioidomycosis; *Coccidioides immitis*, fluconazole

Introduction

Coccidioidomycosis, commonly known as Valley Fever, is a fungal infection caused by inhaling spores of *Coccidioides immitis* and *Coccidioides posadasii.*[1] These fungi thrive in dry desert soils, predominantly in the Southwestern United States with a large prevalence in Arizona and California.[2] The infection can spread hematogenously or through lymphatics to any organ, resulting in diverse clinical presentations. The majority of infected individuals remain asymptomatic or experience mild respiratory symptoms. However, some develop progressive pulmonary infections or extrapulmonary dissemination. The most common extrapulmonary areas of dissemination include the skin, lymph nodes, bones, joints, and the central nervous system. Cutaneous manifestations can present as ulcers, papules, nodules, and pustules. Due to this diversity in skin involvement, misdiagnosis and subsequent inappropriate treatment occur frequently with an incorrect diagnosis of bacterial cellulitis or tinea corporis.

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Case

A 38-year-old man with obesity was referred to an infectious disease clinic due to cutaneous coccidioidomycosis infection of the face. The patient initially presented to his primary care provider, reporting fatigue, knee pain, and a facial rash. Initial treatment with a

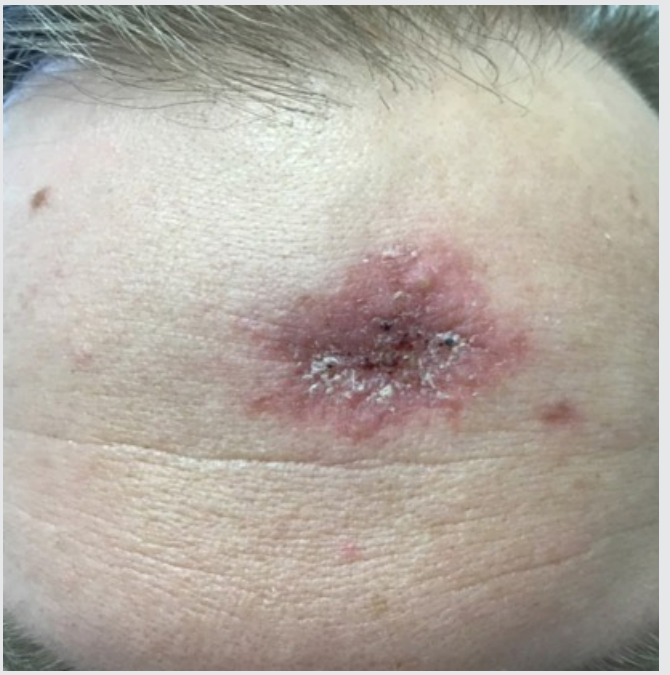

Figure 1. Lesion at initial consultation visit.

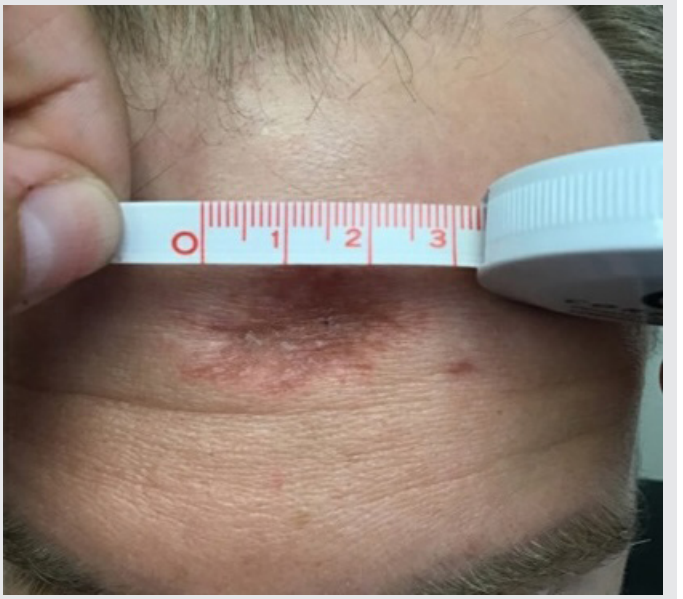

Figure 2. Lesion after 1 month of fluconazole 600 mg daily.

course of oral antibiotics proved ineffective. Given the lack of improvement, the patient was referred to a dermatologist for further evaluation.

Physical examination revealed three erythematous, scaly papules distributed on his right malar cheek, forehead, and scalp (Figure 1). The remainder of his skin examination was unremarkable. Despite another round of oral antibiotics and topical mupirocin ointment, the lesions persisted. Given the persistent nature of the lesions and their resistance to antibiotic therapy, a biopsy and culture of the lesions were performed. These tests confirmed the presence of *Coccidioides immitis*. His vital signs were normal. A chest computed tomography was performed and showed multiple pulmonary nodules consistent with a history of coccidioidomycosis infection. Laboratory results revealed a cocci IgM titer of 1.2, IgG titer of 8.8, and an antibody by complement fixation titer of 1:128. These findings collectively supported the diagnosis of disseminated coccidioidomycosis with cutaneous involvement.

The patient was started on oral fluconazole 200 mg daily for one month. After the initial month of treatment, the patient showed only partial improvement; the dose was increased to 600 mg daily (Figure 2). However, due to the patient's body mass index, the dosage was further adjusted to 400 mg twice daily. This dosage was well-tolerated and resulted in notable improvement of the skin lesions (Figures 3, 4). The patient is now being monitored with follow-up appointments every three months to assess treatment efficacy and potential side effects.

The patient consented to publication of this case.

Discussion

Coccidioidomycosis is a systemic fungal infection caused by inhalation of *Coccidioides immitis* and *Coccidioides posadasii* spores. Also known as *San Joaquin Valley Fever,* coccidioidomycosis is endemic to the Southwestern United States, Mexico, and Central and South America.[3] Of those infected with primary coccidioidomycosis, 60% are asymptomatic; 40% have vague mild to moderate symptoms, including cough, arthralgias, and fatigue.[4] Extrapulmonary dissemination of the disease occurs in approximately 0.26% to 3.4% of cases, often presenting a diagnostic challenge due to its nonspecific symptoms.[5]

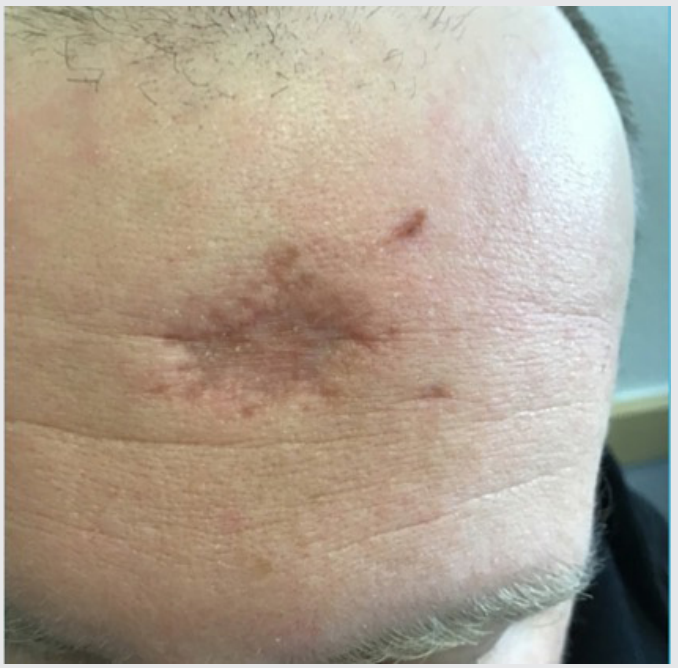

Figure 3. Lesion after 4 months of fluconazole 400 mg twice daily.

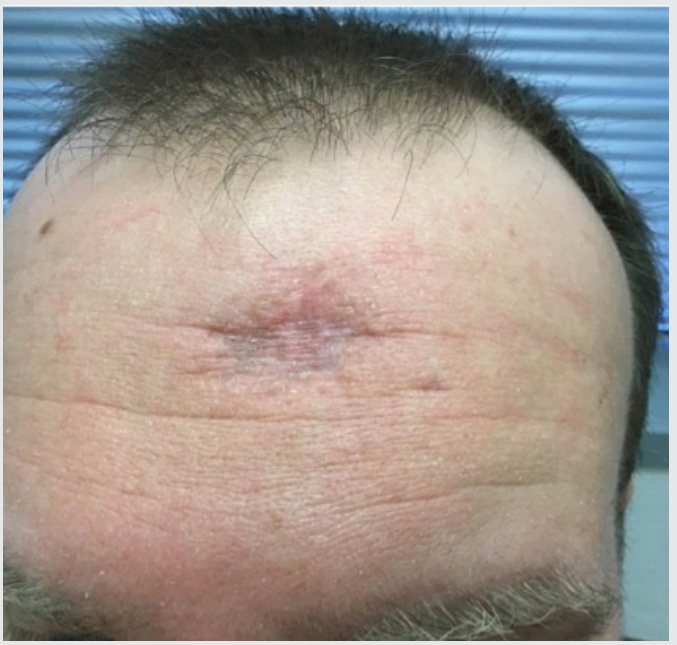

Figure 4. Lesion after 6 months of fluconazole 400 mg twice daily.

Cutaneous coccidioidomycosis, as seen in this case, frequently results from the dissemination of a primary pulmonary infection, which may be asymptomatic. The varied clinical appearance of cutaneous coccidioidomycosis contributes to its frequent misdiagnosis. Lesions can appear as papules, nodules, macules, verrucous plaques, abscesses, pustules, or even scars.[6] This diversity emphasizes the importance of maintaining a high index of suspicion in endemic areas or in patients with a travel history to these regions.

The gold standard for diagnosing coccidioidomycosis is serologic testing. However, sensitivity may be reduced in immunocompromised patients.[7] Diagnosing cutaneous coccidioidomycosis includes isolating the fungus by biopsying the lesion, which can show spherules within multi-nucleated giant cells, and culturing the lesion. Additional tests that can be helpful in diagnosis include complement-fixation assay, polymerase chain reaction tests, and coccidioidal antigen assays. These tests can provide information about the disease severity and prognosis.

Treatment depends on disease severity and extent of dissemination. For mild to moderate cases, as in our patient, fluconazole is the preferred first-line therapy. In severe or refractory cases, a combination of liposomal amphotericin B and either fluconazole or itraconazole is indicated. Treatment duration for disseminated coccidioidomycosis is often prolonged, typically lasting at least a year and sometimes indefinitely in severe cases or with immunocompromised patients. Regularly monitoring clinical symptoms, serological markers, and potential drug-related side effects is essential throughout the treatment course.

Conclusion

This case highlights the importance of considering coccidioidomycosis in the differential diagnosis of persistent cutaneous lesions, especially in patients from or with travel history to endemic areas. The diverse clinical presentation and potential for misdiagnosis stress the need for a thorough workup, including serologic testing culture and biopsy when appropriate. Proper diagnosis and timely initiation of antifungal therapy are crucial for managing cutaneous coccidioidomycosis

and preventing further dissemination. Long-term follow-up is needed to monitor treatment response and adjust therapy as needed. Healthcare providers should maintain a high level of awareness about cutaneous coccidioidomycosis to ensure prompt diagnosis and appropriate management. This case serves as a reminder of the importance of considering fungal etiologies in persistent skin lesions, especially when they are unresponsive to conventional antibiotic therapy.

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