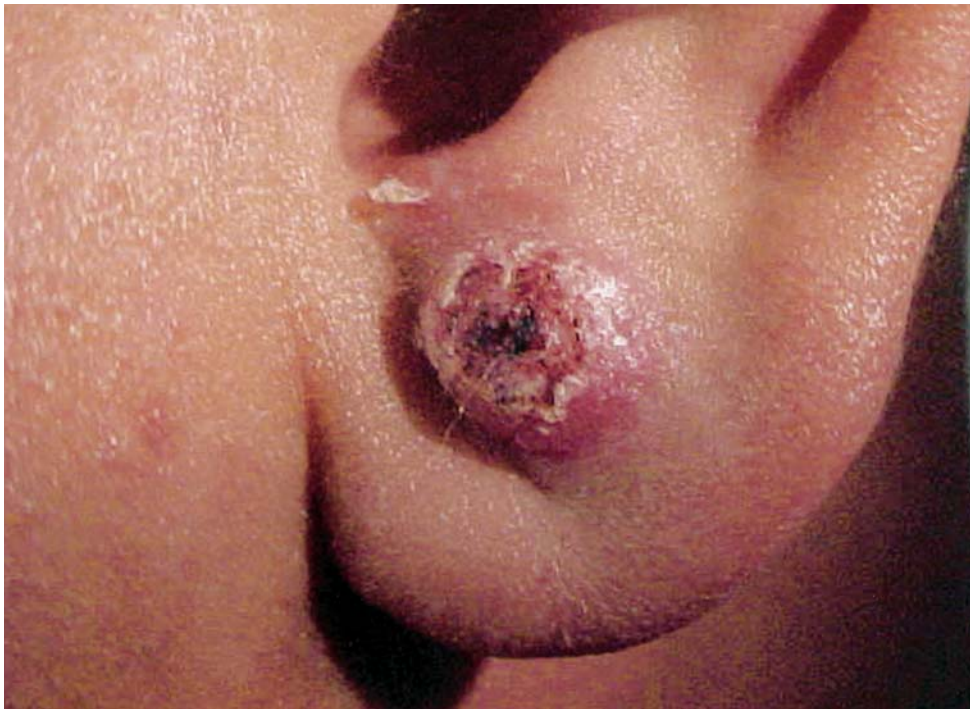
What Is Your Diagnosis?



A 22-year-old Filipino man from California presented with 2 skin nodules and one granulomatous plaque 2 months after a self-limited pneumonia.

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The Diagnosis: Disseminated Coccidioidomycosis

The dimorphic fungus that causes coccidioidomycosis, *Coccidioides immitis*, is found in the soil of the Lower Sonoran life zone. This life zone encompasses the southwestern United States, as well as parts of Mexico, Argentina, Columbia, and Venezuela.[1] Patients are infected by inhaling arthroconidia (airborne spores) of the *C immitis* fungus, which may cause an acute pneumonia or San Joaquin Valley Fever (characterized by fever, arthralgias, and erythema nodosum). Nearly two thirds of patients are asymptomatic.[1] Patients either develop immunity or, in 0.5% to 5% of cases, progress to disseminated disease[2,3]; the skin, bones, and central nervous system usually are involved in dissemination. The initial infection may be subtle, and evidence of dissemination may be found incidentally. Rance and Elston[4] reported a case of skin coccidioidomycosis that was discovered during a routine skin cancer screening. Other presentations may be more dramatic, including a miliary (diffuse micronodular) pattern seen on a chest radiograph, respiratory failure, and skin lesions.[5] Ethnic predisposition to dissemination has been described; Filipinos, African Americans, and Hispanics are at the greatest risk.[6]

Primary cutaneous coccidioidomycosis is a rare phenomenon but occurs when the skin is inoculated directly with fungus-containing soil and usually is accompanied by regional lymphadenopathy.[7] Secondary cutaneous coccidioidomycosis is the most common form of coccidioidomycosis by far and develops after inhalation of the fungus and hematogenous spread. Dermatologic manifestations of coccidioidomycosis include papules, nodules, verrucous plaques that may ulcerate, and shallow ulcers with draining sinuses (Figure 1).[8] Classic areas of involvement include the nasolabial folds and the sternoclavicular area, but any location may be involved. Epiphenomena also occur during the acute illness, including erythema nodosum; erythema multiforme; toxic erythema; and granulomatous dermatitis, without evidence of *C immitis* either by culture or special stains.[9] The differential diagnosis of cutaneous coccidioidomycosis includes other

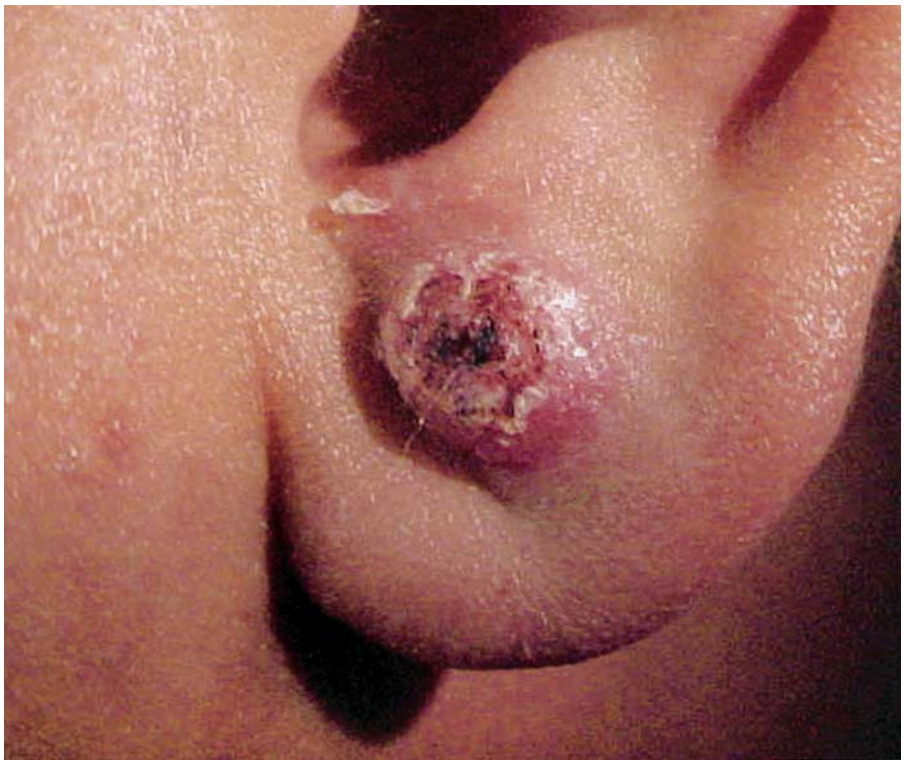

Figure 1. A 22-year-old Filipino man with a skin nodule on his earlobe.

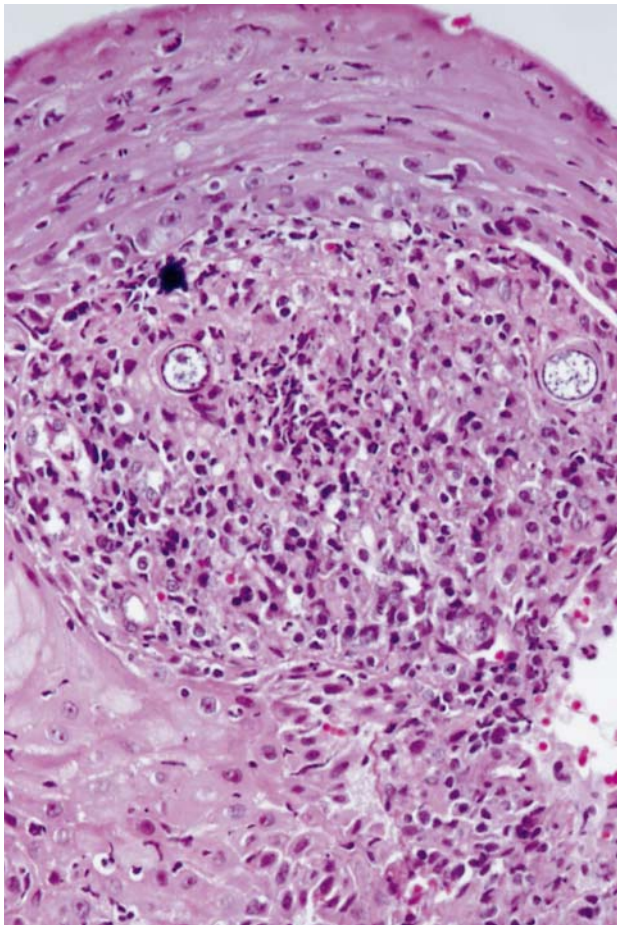

Figure 2. Granulomatous dermatitis with *Coccidioides immitis* spherules (H&E, original magnification ×40).

endemic mycoses (ie, histoplasmosis, blastomycosis, cryptococcosis), tuberculosis, sarcoidosis, squamous or basal cell carcinoma, verruca vulgaris, acne rosacea, and acne vulgaris.

Diagnosis of cutaneous coccidioidomycosis may be confirmed by punch biopsy, tissue fungal culture, or serology. Histopathologic examination may reveal *C immitis* spherules, granulomatous dermatitis, eosinophilic infiltrate, gummatous necrosis, microabscesses, and perivascular inflammation (Figure 2).[8] Complement fixation is the most useful test for monitoring disease activity and for adjusting medications. Patients should be carefully evaluated for bone and central nervous system involvement, as well as for chronic pneumonia, when cutaneous coccidioidomycosis is discovered.

If disease is widespread or rapidly progressive, or the patient is immunocompromised, an amphotericin B regimen should be prescribed. Excluding the above criteria, fluconazole is the drug of choice for skin involvement because of its good oral bioavailability, high concentration in dermal appendages, and low toxicity. The recommended dose of oral fluconazole is 400 mg once daily; however, some physicians recommend higher daily doses (600–1000 mg once daily), especially when initiating therapy.[2] Therapy is continued for a minimum of 6 to 12 months depending on the response rate and complement fixation levels. Lifetime treatment should be considered if dissemination occurs because up to one third of patients may relapse after treatment is discontinued.[10]

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