

## SKINimages

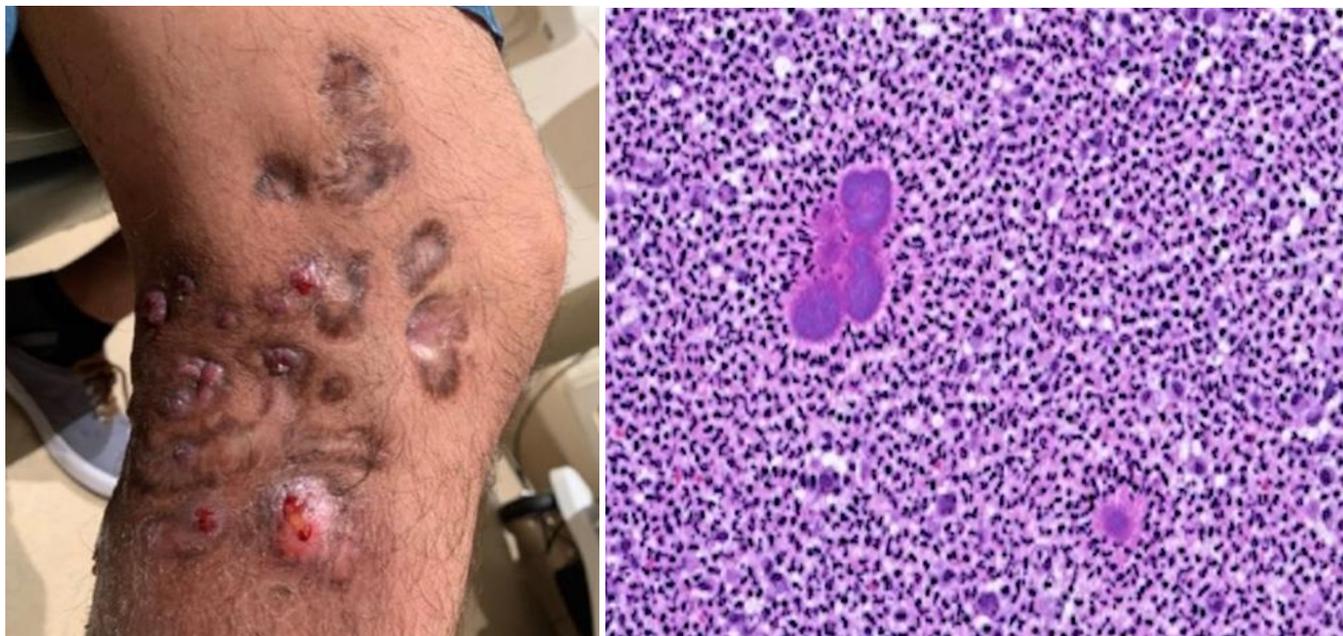
**Actinomycetoma Following Traumatic Inoculation of *Nocardia Brasiliensis***

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A 32-year-old male without significant past medical history presented with acute-on-chronic, mildly tender, enlarging, draining nodules and sinus tracts on the right lower extremity. The lesions had been present for 2 years following a penetrating injury at a construction site in central Mexico. He sought local hospital attention after the injury and was treated with penicillin. He had temporary improvement in nodule formation and subsequent healing with atrophic scars; however, after the completion of antibiotics,

the nodules redeveloped and progressed distally down the leg.

At presentation, he was afebrile, and without signs of systemic infection. An MRI of the right leg revealed widespread superficial soft tissue nodules, fascial edema, and no evidence of bone involvement. A chest, abdomen, and pelvis CT was unremarkable. Examination of the right leg revealed multiple pink atrophic scars with hyperpigmented borders and erythematous nodules draining serous fluid (**Figure 1**). Infectious workup

was negative for HIV, syphilis, cryptococcosis, blastomycosis, and coccidiomycosis. Fungal and acid-fast bacilli (AFB) blood cultures were negative. A wedge excision down to fascia was obtained from an active nodule. Histopathology demonstrated suppurative dermal inflammation with filamentous organisms and surrounding eosinophilic fringe consistent with nocardiosis or actinomycotic organisms (**Figure 2**). Tissue culture was positive for *Nocardia brasiliensis* approximately 20 days later, confirming diagnosis of actinomycetoma.

Mycetomas ensue from implantation of a pathogen into skin resulting in edema, nodules, abscesses, fistulas, sinuses, and purulent drainage with variably colored granules.<sup>1,2,3</sup> There are several subtypes of mycetomas, including eumycotic (fungal pathogens), botryomycosis (bacterial pathogens), and actinomycotic (filamentous branching organisms, including *Nocardia* species).<sup>1</sup> Most mycetomas occur following trauma with exposure to contaminated soil.<sup>1</sup> Actinomycetomas can be caused by various species of aerobic filamentous organisms, including *Nocardia brasiliensis*, a gram-positive, filamentous, aerobe found in soil.<sup>1,2,3</sup> Chronic infections may result from this microbe's capacity to adapt and survive the host's immune response. Differential expression of non-coding RNA may play a role in this process.<sup>2</sup>

Diagnosis can be made by evaluating tissue samples or wound cultures with pathogen visualization.<sup>3</sup> Actinomycetomas contain granules up to 1µm in size, and *Nocardia* species appear as white or yellow/orange chalky colonies on culture that typically grow after one week.<sup>3</sup> Treatment consists of prolonged antibiotic treatment with trimethoprim-sulfamethoxazole (TMP-SMX) or dapsone combined with an

aminoglycoside, either amikacin or streptomycin.<sup>1</sup> Recent studies have found success with linezolid and rifampin.<sup>4</sup>

Actinomycetomas commonly affect Central and South American males around 20-50 years old.<sup>1</sup> While this diagnosis is uncommon in the United States, it is important to elucidate the history of this condition to facilitate quick identification and treatment in regions where the disease is not endemic.

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**References:**

1. Bologna J, Schaffer JV, Cerroni L. *Dermatology*. Fourth edition. Bologna J, Schaffer JV, Cerroni L, editors. Fungal Diseases, Elewski B, Hughey L, Hunt KM, Hay RJ. Philadelphia, Pa: Elsevier; 2018. 1329-1363
2. Cruz-Rabadán JS, Miranda-Ríos J, Espín-Ocampo G, Méndez-Tovar LJ, Maya-Pineda HR, Hernández-Hernández F. Non-Coding RNAs are Differentially Expressed by *Nocardia brasiliensis* in Vitro and in Experimental Actinomycetoma. *The open microbiology journal*. 2017;11(1):112–25.
3. Welsh O, Vera-Cabrera L, Welsh E, Salinas MC. Actinomycetoma and advances in its treatment. *Clinics in dermatology*. 2012;30(4):372–81.
4. Sardana K, Chugh S. Newer therapeutic modalities for Actinomycetoma by *Nocardia* species. *International journal of dermatology*. 2018;57(9):e64–e65.