

*\*\*no patient handout*

# Mycetoma

## Synopsis

☒☒ A mycetoma is a chronic, slowly progressive, tumor-like infection of the skin and subcutaneous tissue obtained after trauma and subsequent contamination with soil and/or vegetation. It may also be referred to as Madura foot, eumycetoma, actinomycetoma, or exogenous actinomycosis of the lower extremities. See endogenous actinomycosis.

Mycetomas may be caused by a number of different genera of soil-dwelling bacterial and fungal organisms including *Nocardia*, *Pseudoallescheria*, *Madurella*, *Actinomyces*, *Actinomadura*, and *Streptomyces*.

When the cause is fungal, the lesion is referred to as *eumycotic*, and it carries a worse prognosis for cure. When the cause is bacterial, it is referred to as *actinomycotic*. These infections are localized, and although they may cause intense local destruction, they rarely cause constitutional symptoms or spread systemically. Painful lesions occur in only 15% of patients.

Risk factors include skin exposure to soil (occupational, traumatic – road rash / motor vehicle accident, shrapnel, carrying crops) and male sex (partly secondary to occupational exposures; male to female ratio is 5:1).

Although infections leading to mycetomas can be contracted anywhere in the world, they are diagnosed most commonly in tropical and sub-tropical regions of the developing world.

Mycetomas develop first as a papule or nodule and slowly evolve in width and depth (actinomycetomas evolve faster than eumycetomas). Eventually, fistulae form, which intermittently exude purulent material of varying hues and consistencies known as granules or sclerotia. This process is indolent and may progress for over a half a century in some patients. Poorer prognosis may be associated with head lesions because they may extend intracranially.

## Codes

ICD10CM:

B47.9 – Mycetoma, unspecified

SNOMEDCT:

410039003 – Mycetoma

## Look For

A hyperkeratotic, tumor-like mass with communicating sinuses, which may swell and actively drain purulent material including "sulfur granules." Tenderness may be present (15% of cases) as well as decreased range of motion. Scarring or hyperpigmentation of healed sinuses is common.

Mycetomas most commonly occur on the feet and lower extremities (50%-75%), where trauma and subsequent soil exposure are most likely to occur. They have been reported on other body areas less commonly (eg, hand, thigh, forearm, shoulder, and head and neck, which are often associated with carrying vegetation over the shoulder).

## Diagnostic Pearls

Many of the organisms that cause mycetomas are slow growing and require extended incubation time in the lab.

Fungal organisms are much larger and easier to identify on histopathology. If the organisms are small (ie, bacteria versus fungi) and are modified acid-fast positive, the organism is *Nocardia* versus *Streptomyces* or *Actinomyces*.

## Differential Diagnosis & Pitfalls

- The lesions of *Mycobacterium marinum* are usually violaceous or erythematous.
- Lobomycosis
- Chromoblastomycosis
- Botryomycosis
- Dermatophyte mycetoma
- Nocardiosis
- Histoplasmosis
- Cutaneous tuberculosis
- Benign and malignant skin tumors

## Best Tests

Gram stain of the purulent discharge may yield "sulfur granules," which are large collections of bacterial colonies. Sulfur granules may be better visualized with silver stains.

Bacterial and fungal cultures are essential to determining therapy and prognosticate on cure rates. Cultures should be obtained after cleansing with saline, not alcohol, to improve yield. If a granule discharged from a sinus can be isolated, it should quickly be dipped in alcohol and then rinsed in saline to reduce confounding colonizing bacterial growth. Prepare two cultures: one at 37°C (98.6°F) and one at 26°C (78.8°F).

Histopathology may reveal foreign-body or suppurative granulomatous reaction and organisms (tissue Gram stain and silver stains) and a positive Splendore-Hoeppli phenomenon.

Plain radiographs should be obtained to rule out osteomyelitis. Lesions may need to be further characterized by MRI.

## **Management Pearls**

If treating with itraconazole, obtain baseline liver function tests and repeat every 6 weeks to 2 months.

If the patient is febrile, consider secondary bacterial infection.

Recommend consultation with Infectious Diseases and Orthopedic Surgery.

## **Therapy**

### **Actinomycotic (bacterial):**

- *Actinomyces*: penicillin V 2-4 g/day divided every 6 hours p.o. for at least 6 months. May continue indefinitely.
- *Nocardia*: TMP-SMX DS twice daily for 6 months minimum, minocycline 100 mg p.o. twice daily for 6 months if drug reaction with or contraindication to sulfonamides.

### **Eumycotic (fungal):**

- Different antifungals have been used with varying success. Consult with Infectious Diseases specialist for therapy (eg, voriconazole may be useful for *Pseudallescheria*).
- Surgical excision/amputation is the most effective cure for fungal mycetomas.

Regardless of the causative organism, if osteomyelitis exists, consider surgical debridement (although medical cures have been achieved for actinomycotic mycetomas with osteomyelitis). Extensive lesions may even require amputation for cure.

Even after surgical excision, recurrences are common.