

Editors: Husn Frayha, MD, and Mansour Al Nozha, FRCP

WHAT'S YOUR DIAGNOSIS?

Submitted by Hala Kfoury, MD, FRCPA; Abdullah Al Fadley, MD

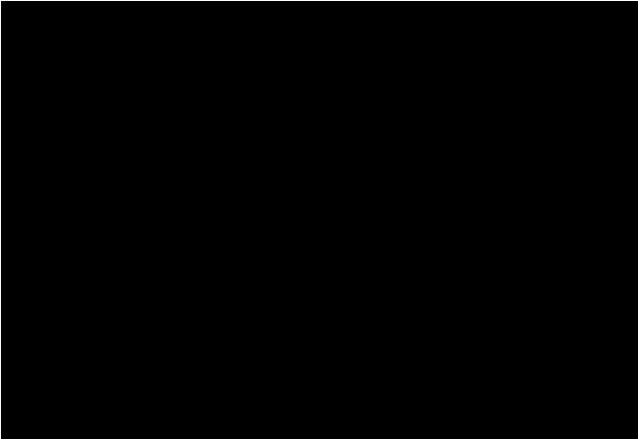


FIGURE 1.

History

A 42-year-old Saudi man presented to the Dermatology Clinic at King Faisal Specialist Hospital and Research Centre with a history of right foot swelling of ten years' duration. The skin of the right foot appeared stretched and shiny (Figure 1). X-ray of the foot revealed considerable soft tissue swelling in the anterior part of the foot,

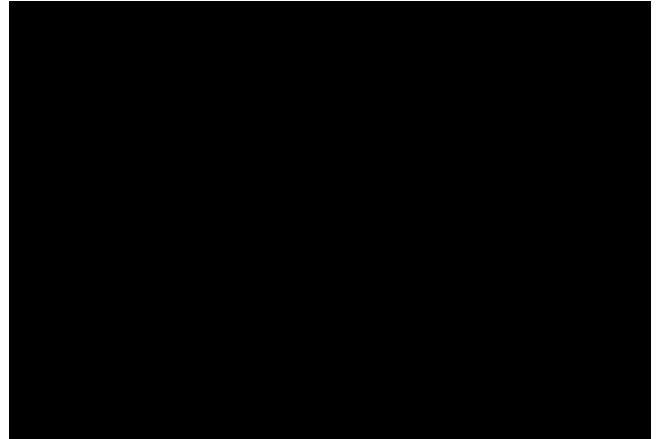


FIGURE 2.

especially dorsally. The bone texture was coarse and grossly abnormal, with widespread radiolucencies (Figure 2).

What is the clinical diagnosis?

ANSWER TO WHAT'S YOUR DIAGNOSIS? (PREVIOUS PAGE)

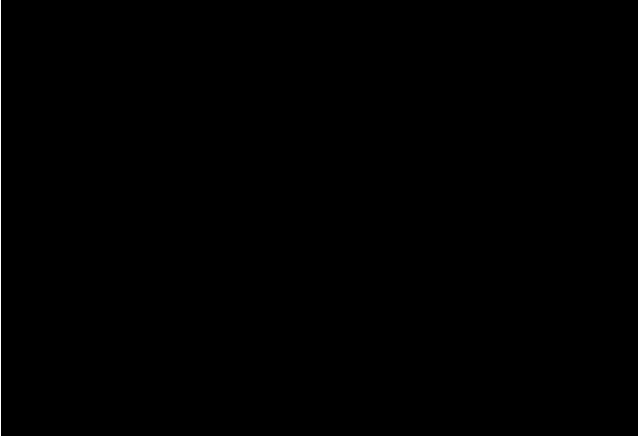


FIGURE 1. A granule of actinomyces species surrounded by polymorphonuclear cells.

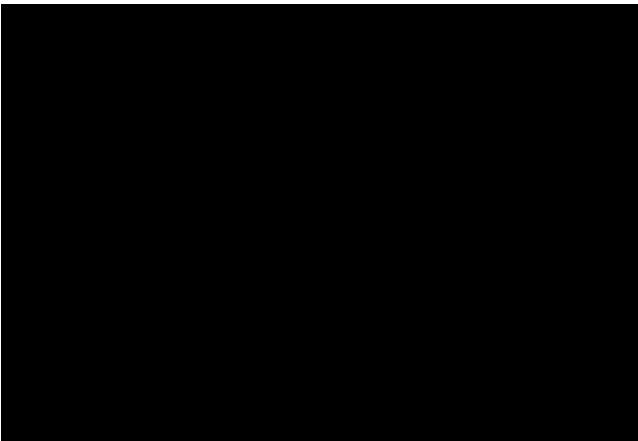


FIGURE 3. A granule of eumycetoma.

Histopathological Findings

A skin biopsy revealed epidermis, dermis and part of the subcutaneous adipose tissue. There was heavy chronic and acute inflammation with granulation tissue surrounding several eosinophilic bodies with a radiating filamentous structure. These bodies were surrounded by acute inflammatory cells (Figure 1). The filamentous structures were gram-positive (Figure 2). The histopathological diagnosis was actinomycetoma (Madura foot).

Discussion

Mycetomas are specific infections of the skin and subcutaneous tissue. Three clinical features characterize

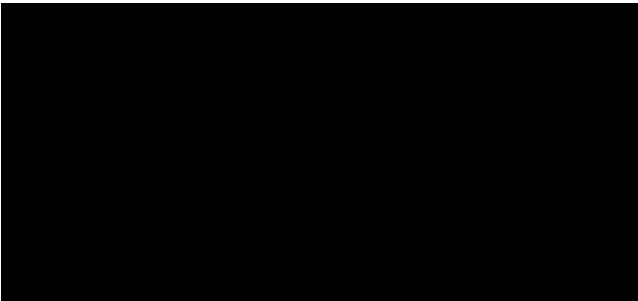


FIGURE 2. Gram stain showing the typical grains of microorganisms.

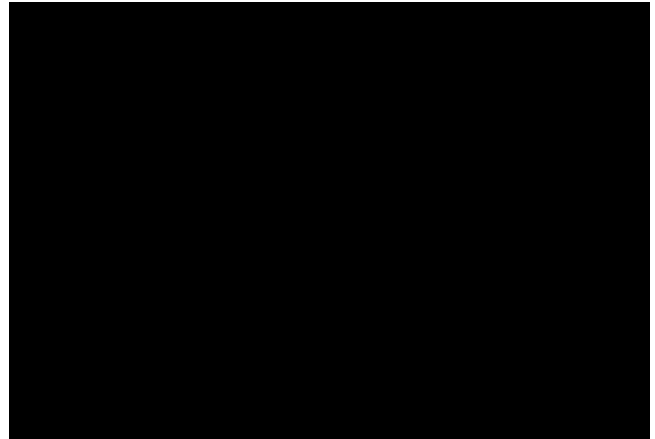


FIGURE 4. GMS stain showing the silver stain positive fungal hyphae.

this infection: the nodules, the draining sinuses and the grains. Although it is usually the lower limbs which are affected, the infection has been reported in many other areas of the body, such as the trunk, the upper limbs and even the scalp. The nodules appear on the skin due to indolent inflammation followed by fibrosis. At a later stage, purulent discharge leads to the formation of draining sinuses. The sinuses do not heal and inflammation involves the surrounding soft tissue, allowing the infection to expand to the deeper soft tissue and bone.

Mycetomas can be caused by a large number of organisms which are divided into two main groups: the mycetomas caused by bacteria (actinomycetomas) and the mycetomas caused by true fungi (eumycetomas) (Table 1). The clinical diagnosis of mycetomas may be relatively easy

TABLE 1. *Principal fungi and actinomycetales causing mycetomas.*

Actinomycetales	Fungi
<i>Nocardia brasiliensis</i>	<i>Madurella mycetomi</i>

<i>Streptomyces someliensis</i>	<i>Madurella grisea</i>
<i>Streptomyces madura</i>	<i>Allescheria boyd II</i>
<i>Streptomyces pelletieri</i>	<i>Leptosphaeria senegalensis</i>

if one considers this possibility in a patient with long-standing non-healing nodules and sinuses of the lower leg. Draining sinuses should stimulate the clinician to look for the grains. These are considered to be of great importance for the mycologist, since the size and the color of the grain are extremely useful for the classification of the microorganisms causing mycetoma. As a general rule, the darker the color of the grain, the worse the response to treatment. The size of the grain varies from a few microns to as large as 5 mm. An important goal is to differentiate between actinomycetoma and eumycetoma, since this will determine the nature of the antimicrobial therapy.

Histopathological examination of a biopsy from the involved area may be extremely useful in arriving at a definitive diagnosis of mycetoma. In hematoxylin and eosin (H&E) stains, sections reveal sinus tracts lined by chronic inflammatory cells and granulation tissue, leading to different small cavities containing large densely packed masses of microorganisms (granules) (Figure 1), surrounded in most cases by an amorphous eosinophilic material (the Splendore Hoeppli phenomenon).² This material is known to be of proteinaceous and lipid nature and is frequently seen at the periphery of an aggregate of organisms, but is not specific to mycetoma infections. Around the granules, collections of polymorphonuclear cell-forming microabscesses are seen. At the periphery, ill-formed granulomas with giant cells may be noted.² In long-standing lesions, fibrosis is prominent and the granules are scanty. Special stains such as Grocott

methenamine silver (GMS), periodic acid–Schiff (PAS) and Gram stain help to differentiate between actinomycetoma and eumycetoma infection. Gram stain demonstrates the acrinomycotic filaments (Figure 2). In eumycetomas, fungal hyphae are seen (Figure 3) which show a positive staining with GMS stain (Figure 4). The nature and morphology of the tissue reaction, however, is similar in both types of mycetomas.

Surgery is of prime importance in the treatment of mycetomas, regardless of the causative agent. Wide surgical debridement is needed when large areas are involved and local excision is the treatment of choice in small lesions. Actinomycetomas respond better to therapy than eumycetomas. In the former, prolonged penicillin therapy is given, but in case of allergy to penicillin clindamycin or streptomycin may be used. For eumycetomas ketoconazole is the treatment of choice.

Mycetomas are known to have a worldwide distribution, however, a predilection for the tropics is well documented. Africa, the tropical and semi-tropical areas of South America, India and Southern Asia are areas where mycetomas have been reported most frequently. Mycetomas are known to affect people living in the rural areas. The mode of infection is usually through a skin puncture by a sliver of wood bearing the microorganisms. In Saudi Arabia, the exact incidence of mycetomas is not known. At the King Faisal Specialist Hospital and Research Centre there have been a total of 23 cases in the last twelve years.

References

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2. Binford CH, Connor D. Pathology of tropical and extraordinary diseases. *AFIP*, 557-61, 681-3.