MADURA FOOT: A CASE OF CHRONIC SUBCUTANEOUS INFECTION CAUSED BY ACTINOMYCETES

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ABSTRACT

Madura foot is a chronic subcutaneous infection caused by bacteria or fungi. It is endemic in climatic zones with warm to hot summers and cool to mild winters with infrequent frost. The infection causes a granulomatous inflammatory response in the deep dermis and subcutaneous tissue, which can invade the underlying bone. Madura foot is characterized by the formation of multiple sinuses that exude grains. These grains contain clumps of the causative organisms that may be discharged onto the skin surface through these tracts. The histopathology of the lesion is essential to diagnose and provide appropriate treatment. A patient with mycetoma may be misdiagnosed because of the rare occurrence of the disease, leading to functional impairment for the patient.

Keywords: Actinomycetes, sinuses, grains histopathology


INTRODUCTION

Madura foot is a chronic skin and subcutaneous tissue infection and derives its name from Madurai in India, where it was first identified. It is also known as mycetoma. The infection is caused by various types of bacteria and fungi, and also referred to as actinomycetoma or eumycetoma, respectively. The causative organism can enter via a recurrent traumatic site. The disease starts as a painless lump below the skin, slowly progressing to the deep dermis and subcutaneous zone, and followed by the formation of multiple tracts that exude grains. Histopathologically, the lesions contain suppurative granulomas surrounding typical grains in the subcutaneous tissue; hence, the disease is typically characterized by a combination of tumorous growth, formation of sinus tracts, and various types of grains containing the causative organisms.

The parts of body in individuals most commonly affected with mycetoma (in descending order) are feet, hands, legs, knees, buttocks, arms, and forearms. The chest wall, head, neck, and back are other infrequent sites affected with the disease. Infectious agents that cause actinomycetoma are Actinomadura madurae, Nocardia asteroides, Nocardia brasiliensis, Actinomadura pelletieri, and Streptomyces somaliensis. Moreover, the agents that cause eumycetoma are the fungal pathogens of Acremonium species, Aspergillus nidulans, Noestudina rosati, and Pseudallescheria boydii. Nocardia species is responsible for most of the lesions on the chest and back, whereas Streptomyces somaliensis causes lesions on the head and neck.

The treatments for actinomycetoma and eumycetoma are different; therefore, it is essential to differentiate between the two types in patients affected with Madura foot.

The diagnosis of mycetoma is made on the basis of clinical means, and is confirmed by the histopathological and microscopic examinations of the exudates and culture.

CASE PRESENTATION

A 25-year-old Nigerian patient presented in skin OPD with swelling in the dorsomedial aspect of the right foot, including the big toe, and similar...
growth in the dorsum of the ankle area of the same foot. The patient’s main complaint was itching and discharge from multiple holes. The patient lives in a rural area and has a history of walking barefoot. A punch biopsy of the lesion was obtained, and sent for histopathology and culture.

**Figure 1.** Long-standing mycetoma

The specimen was evaluated in Gulf Medical University’s CABRI laboratory by a pathologist.

The results of the test are as follows:

**Figure 2.** Microscopic view of the biopsy

1. The sections studied included the epidermis and dermis. The epidermis was hyperplastic, while the dermis showed the granulation tissue and few bacterial colonies surrounded by neutrophils (abscess formation), epithelioid histiocytes, and lymphocytes, which together formed a granuloma. No caseous necrosis was observed.  

2. The results of the examination were consistent with actinomycetoma.

3. Tissue culture revealed no growth of fungus 30 days after incubation, which ruled out eumycetoma.

4. An X-ray of the foot was obtained to observe any presence or extent of the involvement of the bone.

5. Marked abnormal swelling of the soft tissue along the first metatarsal and first digit was observed. In addition, subtle periosteal reaction was observed along proximal phalynx of the first digit.

**Figure 3.** Enlarged view of the biopsy

**Figure 4.** X-ray of the foot

Final diagnosis: Actinomycetoma

**DISCUSSION**

Mycetoma is a chronic disease usually affecting the foot, as in our case, but it can infect any part of the body. Repeated trauma to the affected sites leads to the inoculation of certain fungi or bacteria into the subcutaneous tissue. Mycetoma was first described in 1694, but the first case was reported in 1842 in Madurai, a town in Tamil Nadu, India. Hence, it is also called Madura foot.

Mycetoma typically affects young people, especially males in the age group of 20–40 years and residing in developing countries. In particular, manual workers, such as farmers and laborers, are the most affected by mycetoma.
As mycetoma progresses slowly and is painless, it is usually ignored by the patients; as a result, actual cases reported are significantly lower than true cases prevalent. However, if the disease is detected and treated early, morbidity of the patients can be reduced. Due to the lack of adequate healthcare facilities in most endemic areas, the patients usually present late with advanced infection, wherein amputation may be the only available treatment. In the case reported in this study, amputation was the only treatment option because of diagnostic difficulties in the area of his origin.

The treatment for mycetoma depends on the causative organism. In the case mentioned above, the patient was histopathologically diagnosed to have actinomycetoma. He was advised a combination of drugs: gentamicin 80 mg, twice a day, and cotrimoxazole 320/1,600 mg, twice a day, for one month, followed by doxycycline 100 mg Bd and cotrimoxazole for 5–6 months.

Mycetoma is not a disease that needs to be notified. Hence, there are no planned measures or programs to control the disease. However, advice regarding proper use of occlusive footwear can reduce the incidence of mycetoma.

CONCLUSION

For any swelling of the foot with discharging tracts, mycetoma forms an important part of differential diagnoses and biopsy is a crucial tool for correct diagnosis.

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