

## Mycetoma Madura Foot – Case Report

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### ABSTRACT

*Madura foot or mycetoma is a chronic granulomatous disease described by the confined infection of subcutaneous tissues by actinomycetes or fungi. The inflammatory response can expand to the basal bone. Mycetoma was specified first in the mid-1800s and was initially known as Madura foot. The infection can prompt by true fungi (eumycetoma) in 40%, or filamentous bacteria (actinomycetoma) in 60%. Actinomycetoma may be due to Actinomadura madurae, Actinomadura pelletieri, Streptomyces somaliensis, and Nocardia species. The infection may remain inactive for a period and it cause small, subcutaneous swellings that expand, soften with pus, and crack through the skin surface, with synchronous influx of deeper tissues. Sulfonamide, iodide, and anti-toxin treatment have been required against the actinomycotic contaminations, but the fungi are insusceptible to the treatment. I report a patient of Madura foot from Mahatma Gandhi Medical College Hospital Research institute, Puducherry. Mrs. Indira, 40 years old female, came with the complaints of swelling over right index finger for 4 years, swelling which is initially small and progressed to grow bigger size. She had the complaints of pain over the swelling on and off for 4 years, fever, history of discharge and trauma (prick) from the swelling and lymphnode enlargement. Patient presented with restricted movements for 4 years for that she was operated under local anesthesia 3 years back. On physical examination, swelling present over right index finger, 4 cm circumference, multiple scarring, sutures, and discharges from finger also observed. She underwent investigations like MRI which reveals that, multilobulated mass in the soft tissues surrounding the proximal and middle phalanges of the 2nd digit, no bone or tendon pathology identified this is likely to be an infectious process like actinomycetes or tuberculosis. On removed biopsy from right index finger shows that hyperkalemia and acanthotic skin with subepithelium showed chronic inflammatory granulation tissues with infiltration by lymphocytes plasma cells and occasional foreign body giant cells. There was a focus showing brownish granules, consistent with fungal morphology of Madura mycosis, stain for fungus: positive.*

*Patient was on treatment of T. Flucanazole OD for 5 days and she underwent amputation of right index finger. Postoperatively patient was normal.*

**Keywords:** Actinomycetes, granules, Madura foot, pathogens

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### INTRODUCTION

Mrs. X, 40 years old female came to Mahatma Gandhi Medical College Hospital Research institute, Puducherry with the complaints of swelling over Right Index Finger for 4 years, swelling which is

initially small and progressed to grow bigger size. She had the complaints of pain over the swelling on and off for 4 years, fever, history of discharge and trauma (prick) from the swelling and lymphnode enlargement. Patient presented with

restricted movements for 4 years for that she was operated under Local Anesthesia 3 years back. On physical examination, swelling present over right index finger, 4cm circumference, multiple scarring, sutures, and discharges from finger also observed.

She underwent investigations like MRI which reveals that, multilobulated mass in the soft tissues surrounding the proximal and middle phalanges of the 2<sup>nd</sup> digit, no bone or tendon pathology identified this is likely to be an infectious process like actinomycetes or tuberculosis. Skin Biopsy from right index finger, showed Hyperkalemia and acanthotic skin with sub-epithelium showing chronic inflammatory granulation tissues with infiltration by lymphocytes plasma cells and occasional foreign body giant cells. There was a focus showing Brownish granules, consistent with fungal morphology of Madura Mycosis, stain for fungus: Positive. Patient was on treatment of T. Flucanazole OD for 5 days and she underwent amputation of right index finger. Postoperatively patient was normal.

Madura foot is an endemic in the tropics and subtropics region. The inflammatory response can outspread to the basal bone. Mycetoma was characterized first in the mid of 1800s and was initially known as Madura foot. This infection developed by true fungi (eumycetoma) in 40%, or filamentous bacteria (actinomycetoma) in 60%. Actinomycetoma may be due to *Actinmadura madurae*, *Actinmadura pelletieri*, *Streptomyces somaliensis*, and *Nocardia* species it is a deep mycosis caused by exogenous fungus or actinomycotic species. These infections

may responsible to the progressive inflammation of the skin, hypodermic tissue, muscles and bones. The organism comes via severe trauma in the foot, hand, or eyes from saprophytic soil. After entering in the body, they form subcutaneous nodules containing suppurative granulomas, multiple cavities, and sinus tracts. The sinus tracts release exudates with fine grains. These grains are colonies of uninhibited organism [1, 2]. The disease is often neglected in the initial stage due to the existing socio-economic condition and low living standard of the people of this area. Commonly the diagnosis is done at an advanced stage. Good clinical response with proper pharmacological therapy exclusively has been reported [3].



**Fig. 1.** Discharge from sore.



**Fig. 2.** Black eumycetoma grain.

Surgical debridement done by constant treatment with antifungal and antibiotic has been demonstrated efficacious in many

cases [4]. Amputation of limbs treated by the antifungal and antibiotic therapy and reassemble have been done for a number of cases [5]. Surgical excision is obligatory when bone is involved as detected radiographically (Figures 1, 2) [6].

## CASE REPORT

### Pathology and Clinical Features

According to Bidie and Carter states that Madura foot is caused by fungi, which in rainy areas are found as saprophytes in the soil, usually originated through skin wounds in those who walk bare footed (farmers, nomads) and are usually exposed to the penetrating wounds. Infection initiate within the skin and subcutaneous tissue causing severe or nodular swelling which tends to grow and rupture, forming communicating sinus tracts through which mucous carrying the characteristic colored grains is released. Some sinuses recover with scarring while crisp sinuses seem somewhere else, causing the augmentation and disfigurement of the affected limb. Eventually damage of bone happens when grains permeate the cortical margins and replace the spongiosa. General illness are rare, and fever commonly a symptom of secondary bacterial infection [7, 8].

The infection does not outspread hematogenously in spite of cases are known where particularly *Pseudallescheria boydii* and *Nocardia asteroides* in immunocompromised patients (leukemia, HIV, use of corticosteroids, and immunosuppressive drugs) have diffused hematogenous to the brain, myocardium, and the thyroid gland [9, 10]. The amalgamation of the clinical picture (indurated swelling of the foot with multiple sinuses that release pus filled with grains), macroscopically typical grains, and the histopathological appearance is attribute of the diagnosis. Grains vary from 0.2 to 3.0 mm in diameter and can be black, white, yellow, pink, or red, depending on the microorganism involved [1, 7]. On

microscopy, a hematoxylin-eosin (HE) stain is generally able to examine and identify the characteristic grains. They are enclosed by the inflammation with polymorphonuclear leukocytes, epithelioid cells, plasma cells, and multinucleated giant cells with areas of fibrosis. Two groups of mycetoma are distinguished: Eumycetoma (caused by eumycetes or true fungi) and Actinomycetoma (caused by fungi like aerobic bacteria).

Although particular species of dermatophytes are known for their mycetoma – like infection as well, they do not lead to injury of the bone and therefore are not considered real mycetoma [11, 12]. Gram staining can be used for the recognition of the branching hyphae within the actinomycetes grains, while periodic acid Schiff (PAS) staining is appropriate for identification of the hyphae of eumycetes. Affirmation of the analysis and correct recognizable proof of the species require culture. Although theoretically more specific than histology, culture is difficult practically. Although the clinical picture is attributive, diagnostic confusion may occur with chronic bacterial osteomyelitis, especially when bone damage has happened. Botromycosis can give a similar picture; it is a chronic bacterial infection caused by gram-positive cocci (*Staphylococci*, *Streptococci*) and gram-negative bacteria (*Escherichia coli*, however, organs can be influenced by the process too. Neoplasms (benign and malignant) should be eliminate as well [13].

### Management

Initiation of treatment at an early stage is necessary to abate the suffering of the patient and to prevent complication. Treatment of mycotic mycetomas is often unrewarding. It is based on surgical excision since, chemotherapeutic agents (ketoconazole, itraconazole) are expensive and often not effective [14–20]. A delayed diagnosis may need extensive excision

which may not always be adequate and more taxing to the patient. The medical treatment consists of antibiotic therapy (cotrimoxazole, amikacin or minocycline) for actinomycetes or antifungal therapy (ketoconazole or itraconazole) for eumycetoma [21].

In resistant cases of eumycetoma, various antifungals (terbinafine, posaconazole, voriconazole, caspofungin, and anidulafungin) are indicated [22]. A prospective study showed that itraconazole in a starting dose of 400 mg then 200 mg for the treatment of patients with mycetoma due to *Madurella mycetomatis* is safe and well tolerated with minimal side effects. And it is recommended to give itraconazole in a high dose (400 mg) preoperatively to facilitate lesion localization by fibrosis [23]. In my patient, the actinomycetomas, patient responded well in 8 weeks with flucanazole. For most drugs, it is necessary to continue treatment for at least 10 to 12 months and many of these drugs are toxic. Surgery is determined in mycetoma for resistance to medical treatment, better response to medical treatment in patients with massive disease or for localized lesions. The surgical objectives start from local excisions to amputations. Amputation is indicated in advanced mycetoma not responding to medical treatment with severe secondary bacterial infection.

## DISCUSSION

Madura foot was first recognized in 1842 by Gill in Madura district of Tamil Nadu in India. Madura foot is a deep mycosis cause due to eumycetes (fungi) and actinomycetes (filamentous bacteria). It is seen in tropical and subtropical regions. The disease was first recognized by Dr Gill in 1842 from South India [24]. Its incidence is likely to rise in temperate regions as well due to increase in worldwide travel [25]. Eumycotic

mycetomas were more common in northern India; however, the recent trend shows an increase in incidence of Actinomycetomas [26]. Common Actinomycotic agents are *Actinomadura*, *Streptomyces*, and *Nocardia*, whereas common eumycotic agents are *Madurella*, *Pseudallescheria*, *Acremonium*, and *Leptosphaeria*. Cultures of mycetoma are usually problematic due to rigorous growth requirements, contamination by other bacterial organisms and because patients usually present late when the fibrosis predominates over the purulent discharge. Thus, continuous attempts to culture the microorganism can fail [9, 10].

## CONCLUSION

We reported a case of Madura foot in this article. Despite it is an unusual illness; it might be tumbled in our daily practicing life specifically in a country where more than 75% of the people are working barefooted in the fields. Instant and scrupulous conservative and surgical measures and efficient nursing care could be of enormous advantage for these patients.

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