

Case Report

A case of Madura foot

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ABSTRACT

Madura foot is a chronic infection caused by bacteria *actinomycetes* or by fungi *eumycetes* and is endemic in tropical and subtropical areas. The cases have been reported from the other areas as well. Foot is the primary involved organ. A 50-year-old male presented with multiple small swellings over right foot who was already diagnosed as Madura foot for which the patient was on the medications from several years with no effect. The infection tends to recur after the medications were stopped. He took penicillin injections till it was banned few years ago without any benefit. He visited the surgical outpatient department (OPD) and managed by below knee amputation from tibial tuberosity preserving 15 cm of proximal leg as stump. There was no complication post-operatively and patient was discharged in a stable condition with clean wound. The diagnostic and therapeutic challenges along with the epidemiological data emphasize the need of raising the awareness of physicians to this devastating condition.

Keywords: Madura mycosis, Below knee amputation, Multiple swellings, Foot injury

INTRODUCTION

Eumycetoma is a chronic granulomatous soft tissue infection, affecting mainly the limbs, and sometimes the abdominal and chest walls or the head. *Mycetoma pedis* (mycetoma of the foot), the most common form of eumycetoma, is known widely as the Madura foot.

It is characterized by a triad of tumour-like swelling, multiple sinuses, and a grain-containing discharge. It is recently defined by World Health Organization (WHO) as a neglected tropical disease that is burdening health systems worldwide whose real impact is thought to be highly underestimated.

The pathology was first described in 1832 by Gill in Madurai, a south Indian city, for the unusual nodular appearance of leg among field workers that was named Madura foot.¹ Later in 1860, Cater named it as “mycetoma” by describing its fungal etiology. Later, it was divided into two separate etiological categories—

actinomycetoma (bacterial) and eumycetoma (fungal).² Most common causative agent is *Madurella mycetomatis*.

The disease is endemic in tropical and subtropical regions in the “mycetoma belt” which stretches between the latitudes of 15° south and 30° north, though cases have been reported beyond this area.³ The exact incidence and geographical distribution of mycetoma throughout the world is not known as the disease is usually painless, slowly progressive and presented to health centres only in late stages by majority of patients.

Mycetoma causes high morbidity. An early diagnosis and management of this rare infection are crucial in preventing disease progression, disability, and possibly even amputation.

CASE REPORT

A 50 year old male patient with past history of right foot injury 25 years ago, came to surgical outpatient

department (OPD) at GCS Hospital with complaint of multiple small swelling over the right foot.

He gave a history of right plantar corn injury by a sharp pointed end of a stone while playing. The injury was then infected, and treated by local penicillin injection. The infection cleared in few days, only to reappear after a week again which was treated by penicillin locally. This was repeated until 2011 when he was referred to dermatology department at GCS Hospital, Ahmedabad. Meanwhile, the lesions continued to spread. The department of dermatology diagnosed it as Madura foot, for which he received oral medication for 7 years i.e. till 2018, without any result.

He continued taking penicillin injections for a while until the drug was banned. He received no further treatment.

Then in 2019 he visited surgery OPD, GCS hospital (Figure 1).

On examination, no systemic illness was found in this patient. Patient was not suffering from any co-morbid condition. The examination of local part showed multiple swellings on the right foot that were present in clusters, varying in size and shape, with mild haemorrhagic and purulent discharge, covering the entire foot along both the plantar and dorsal side, up to just below the right ankle (Figure 2 and 3).

It was diagnosed as superimposed infections on Madura foot. The only solution to stop the spread and as a form of permanent treatment was amputation of the affected leg. For this, the patient and his relatives were counselled and the patient was admitted in the ward.

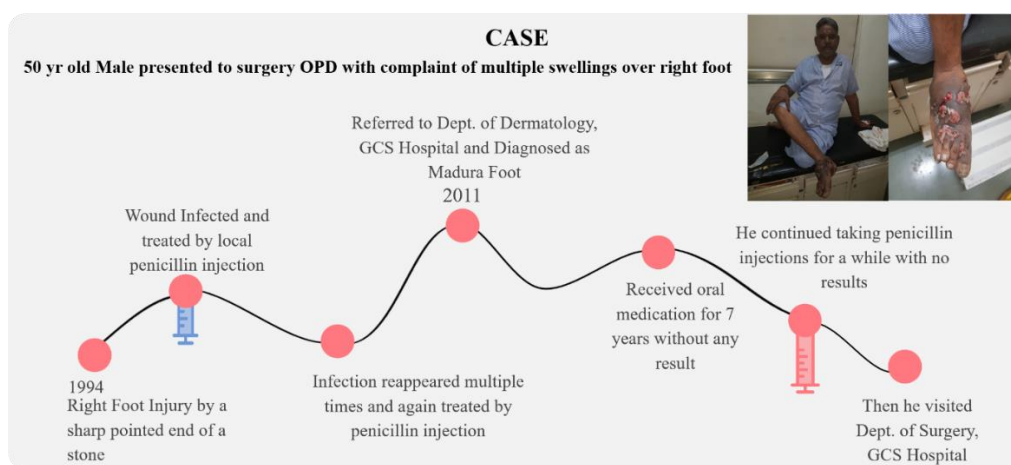


Figure 1: Case history of the patient.



Figure 2: Lesions over dorsum of foot.



Figure 3: Lesions over palmar surface of foot.

A pre-anaesthetic check-up was performed which indicated the patient fit for the surgery. The blood profile was normal, human-immunodeficiency virus (HIV), hepatitis B surface antigen (HbsAg) non-reactive and renal function test (RFT) as well as liver function test (LFT) were unaltered.

The X-ray right foot lateral and antero-posterior (AP) view showed soft tissue opacities and radio-opaque calcification (Figure 4 and 5).

In pus C/S, no organisms were isolated whereas the histopathology showed hyperkeratosis and perkeratosis showing granulomas of bacterial colonies (neutrophils, lymphocytes, giant cells and vascular proliferation with fibrosis).

Below knee amputation was done for this patient from tibial tuberosity preserving 15 cm of the proximal leg as stump. Post operatively, the patient was given antibiotics

and 1-pint packed cell volume (PCV). No complications were encountered. Daily dressing was done.

On post op day 2, amputated stump was mounted and physiotherapy started for movement of knee and weight bearing on the remaining limbs.

On post op day 6, patient was discharged in a stable condition. Surgical wound was healthy and clean, with minimal necrosis of the stitched site.



Figure 4: X-ray foot lateral.



Figure 5: X-ray foot AP.

DISCUSSION

Mycetoma is considered to be an ancient disease though it was first described in modern day India in 1832, as presumably described by *Atharva veda*, the ancient Sanskrit text which refers to “pada valmikam,” meaning “anthill foot”.¹ It might very well be an ancient disease in the Mediterranean region as well, previously assumed to be the disease of Philoctetes, the mythological Greek hero described by the Greek tragedian Sophocles.^{4,5} There are modern reports of locally acquired cases also in temperate zones.⁶

In a burial cave of byzantine era in the Bet Govrin area of Israel, a female skeleton was found and reported in 1992 by Herskovitz and others, and it was found to have characteristic pathological changes in lower extremities

which was presumed to be a result of mycetoma infection.⁷ Based on suggestive deoxyribonucleic acid (DNA) results, this theory was later challenged and an alternative diagnosis of leprosy was offered.⁸ The diagnosis of mycetoma either as a primary or a secondary infection still holds substantial ground.

A few relevant clinical points rise from this case. The first is the long incubation period seen. Among patients, the mean time from exposure to symptom onset was 5.6 years (range 1–10 years). Such long incubation periods are commonly reported in the literature.⁹⁻¹¹

Another interesting point is the delay between onset of symptom and the establishment of diagnosis despite numerous interactions with medical personnel. The mean time from symptom onset to diagnosis was 6.6 years (range 0.2–35 years). This point is in accordance with most of the previously reported cases.¹² In other words, the diagnostic delay in mycetoma is probably a rule rather than an exception. The reasons for this delay may include poor access to medical care and lack of proper diagnostic tools. We presume that the main reason for this delay lies in the rarity of this condition.

Treatment of actinomycetoma is more effective than eumycetomas.³ The gold standard today is considered to be trimethoprim–sulfamethoxazole sometimes in combination with dapsone or amikacin.¹³

However, with eumycetoma long-term treatment with antifungal therapy combined with surgical treatment is the mainstay. But the failure and recurrence rates are high, especially with more advanced disease. It dictates the urgent need for development of novel medical therapy. Undeniably, this is considered one of the main knowledge gaps for this disease.¹⁴

CONCLUSION

Often due to its slow progression, many cases present as chronic pathologies as they initially cause no impairment to function. However, as the infection progresses, invasion into deeper structures accompanied by increasing visual or functional impairment often initiates patients to seek medical advice.

In the absence of surgery, anti-infective regimens are often prolonged because of the tendency of *Actinomyces* spp or eumycetoma to recur. In this case also, the medications failed to relieve the condition and hence, the amputation was done. In this context, the importance of patient education about avoiding walking barefoot in highly endemic areas and early wound disinfection must be part of patient education in clinics throughout the world.

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