Mycetoma is a chronic progressive granulomatous infection characterized by a painless swelling, development of sinuses that discharge pus and grains of different colors. It will ultimately involve bone that shows cavities in a plain x-ray. It is important to determine whether the cause is bacterial (Actinomycetoma) or fungal (Eumycetoma) because the former is treated by antibiotics and the latter by antifungal drugs. Laboratory diagnosis is established by culture of grains or stained sections for Histopathological examination. A good approach for treatment is removal of the affected tissue followed by antibiotic or antifungal for a period of about nine months. The patient is to be followed up carefully for fear of side effects of the drug.

INTRODUCTION

Mycetoma Foot is an improvement on the old name Madura foot which was coined by Carter in 1874 to describe a condition that affected a patient from Madura District in South West India [1]. Hence derivation of the genera Madurella, Actinomadura and the species madurae. The disease is no longer limited to India but has been reported globally with high endemicity in Mexico, Venezuela, Sudan, Saudi Arabia and immigrants to Europe and America.

Countries of the Mycetoma belt extend between the Equator and the tropics of Cancer and Capricorn. These areas have hot weather and enjoy rain only for three months and nine months of dry season. Such weather results in growth of savannah type of vegetation and Acacia trees armed with thorns. Persons affected are those who work bare footed like farmers and animal herders but no occupation is immune in endemic areas. Men are affected more than women. Though patients who report to hospital are aged between 20 and 40 years. Children are also seen [2].

CLINICAL PICTURE

The disease affects the foot in 70% of cases but Mycetoma from other body sites has also been reported [2]. Mycetoma is initiated by entry of the organism from soil through thorn pricks, wood splinter or stone cut or any cause of breach of the skin. Next subcutaneous tissue is affected and ultimately bone. After an incubation period not less than three months a swelling the size of a pea appears; and if not removed will gradually progress to a large size. Patients usually report late to hospital because they think that it will get cured by itself. If untreated swelling increases, sinuses develop and serosanginous discharge containing fungal or bacterial grains and pus pour out (Figure 1).

On examination the skin is attached to a firm swelling with defined border in case of Eumycetoma but the margin diffuses in Actinomycetoma. Skin may remain normal or become dark colored or depigmented. It may also show more sweating than the other limb. The inguinal lymph nodes may be enlarged due to inflammation or spread of the organism to them. Doctors are therefore warned not to forget examining the regional lymph nodes [3].

RADIOLOGY

On a plain x-ray Mycetoma lesions show a dense granuloma of tissue and bone cavities which are small and numerous in Actinomycetoma (Figure 2), but large and few in Eumycetoma. On ultrasound grains show oncogenic shadows; extent of lesion is well exemplified by MRI [4-6].

CAUSATIVE ORGANISMS

More than 59 organisms have been recorded causing mycetoma [7]. However common fungi are Madurella mycetomatis, M.grisea, Leptosphaeria senegalensis, Petrilidium

Figure 1 Actinomycetoma Foot.
boydii while common bacteria are *Actinomadura madurae*, *A.pelletieri*, *Nocardia brasiliensis* and *Streptomyces somaliensis*. Organisms may vary from country to country or from one area to the other within the same country.

**DIAGNOSIS**

A well-developed mycetoma foot is easily diagnosed by the triad of progressive painless swelling, sinuses and discharged grains. Radiograph shows bone cavities. For laboratory confirmation a deep seated biopsy or fine needle aspirate containing grains are needed [2,8]. Fungi are grown on 2% glucose nutrient agar containing a wide spectrum antibiotic (Sabourauds agar). Bacteria are cultured on Lowenstein Jensen medium first and then transferred to serum agar or brain heart infusion agar. Fungi grow as molds and *M. mycetomatis*, the commonest fungus, produces a brown diffusible pigment (Figure 3).

Bacterial colonies are smooth bearing the color of grains which is either white, yellow, orange or red depending on the species (Figure 4). Histopathological sections are stained with Haematoxylin and eosin. Each individual grain has its own affinity for the stain; configuration and size which is characteristic (Figures 5 & 6). Grains are situated in the middle of neutrophils. Serological diagnosis is performed in few centers for diagnosis.
and follows up of treatment. These include counter-immuno electrophoresis “CIE” (Figure 7), ELISA and Immunoblotting [9-11]. PCR has been used to detect *M. mycetomatis* from soil [12] (Figure 7).

**TREATMENT**

A wise approach to treatment is to seek early small lesions which can be completely excised. In advanced lesions surgery is performed in bloodless field using a tourniquet and removing as much as possible of the affected soft tissue. Antibiotics or antifungal are prescribed depending on the type of mycetoma to prevent recurrence. For Actinomycetoma several regimens of combination therapy has been reported but amicasin in cycles coupled with cotrimoxasole is the best [beware renal and ototoxicity by close follow up] [13-15]. In Eumycetoma ketoconazole was reported before [16] but due to its side effects itraconazole or voriconazole are prescribed [17].

Medical treatment of Mycetoma may take 9-12 months. Failure of treatment often is due to misdiagnosis of the causative organism or noncompliance of the patient in taking the drug (Figure 8 & 9).

**WHO GETS A MYCETOMA?**

Not everybody who walks bare footed and exposed to injury even if he or she lives in an endemic area gets a mycetoma. These patients were found deficient in their cell mediated immunity [18,19]. Such patients may get two mycetomas of the same or different organisms. There seems to be a genetic predisposition because close relatives living in the same area get mycetoma.

**REFERENCES**


