Singapore Med J 1997; Vol 38(6):268-269

Clinics In Diagnostic Imaging (26)

P Corr

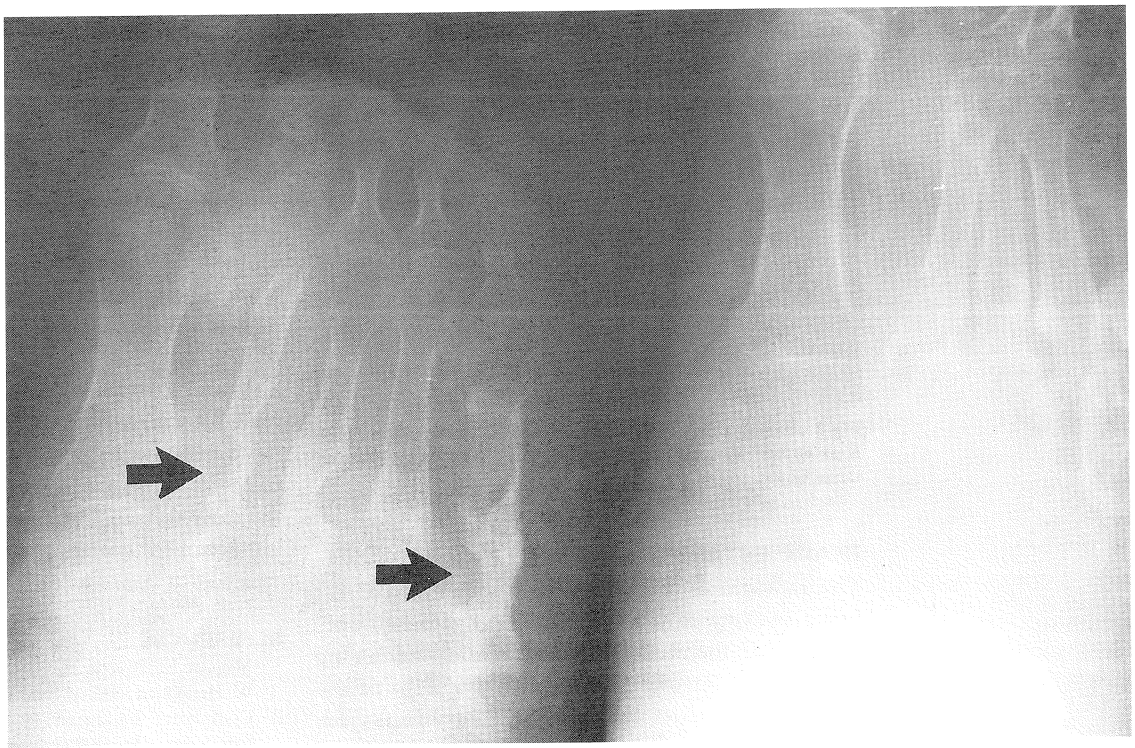

Fig 1 - Frontal (left) and oblique (right) radiographs of the right foot.

CASE REPORT

A 40-year-old African man presented with a painful swelling of his right foot. The swelling developed following minor trauma to the sole of the foot six months previously while playing football barefoot. Clinical examination confirmed a grossly swollen right foot, with nodular skin thickening and sinus formation plantarly. Black granules were noted in the sinus discharge. Radiographs (Fig 1) were performed. What is the diagnosis?

Department of
Diagnostic Radiology
University of Natal
Durban, South Africa

P Corr, MBChB, FRCR,
FFRad (SA)
Professor and Head

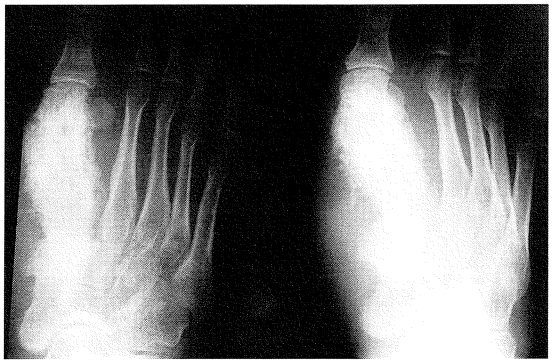

Fig 2 - Radiographs of another patient with Actinomycetes osteitis. There is proliferative periosteal reaction and prominent sclerosis of the first metatarsal bone.

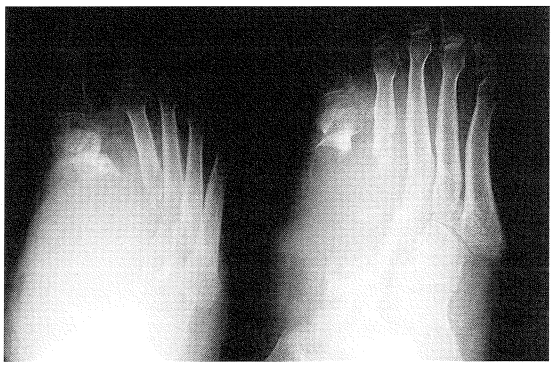

Fig 3 - Radiographs of a different patient with Madura foot. There is extensive destructive osteolysis of the medial metatarsal and tarsal bones.

IMAGE INTERPRETATION

The radiograph (Fig 1) demonstrates marked soft tissue swelling of the forefoot with "punched-out" erosions of the metatarsals with cortical thickening and sclerosis (arrows). Destructive osteolysis of the tarsal bones is better appreciated on the oblique view. Features were suggestive of chronic osteitis.

DIAGNOSIS

Madura foot (or mycetoma)

CLINICAL COURSE

The skin biopsy and culture of the sinus confirmed mycetoma infection with *Streptomycetes madurae*. The patient was treated with oral anti-fungal agents and surgical debridement with amputation of the affected toes. He made a complete recovery.

DISCUSSION

Mycetoma describes a chronic granulomatous disorder due to fungal or actinomycetes infection. The actinomycotic mycetoma is caused by aerobic actinomycetes such as *Nocardia brasilensis* and *Streptomycetes madurae* while the mycotic group are caused by true fungi such as *Madurella mycetomii*. The infection is often introduced by foreign body innoculation such as a thorn or from minor injury. It is common where patients walk bare-footed. It was first described by Gill in Madura, India and hence the expression "Madura Foot". This lesion is however prevalent throughout tropical Africa, Saudi Arabia, India, Central and South America[1,2].

The foot is the most commonly infected region, followed by the hand and retroperitoneum[3]. There is usually a long asymptomatic incubation period, followed by the formation of a subcutaneous granuloma. This spreads by contiguity into deeper soft tissues such as the plantar aponeurosis and muscles. Lymphatic spread to regional lymph nodes is common. Skin sinus formation is common with pus discharge which characteristically contains fungal granules. Subcutaneous nodules and abscesses may also be seen.

Bone involvement is common[3]. There is contiguous spread from the infected soft tissues, with development of cortical erosions and periosteal reaction (Fig 1). The development of marked sclerosis is common, particularly in those patients infected with actinomycetes, *Streptomyces pelletieri* and *madurae*[2] (Fig 2). In some patients, there is diffuse osteopaenia with marked bony and cartilage destruction which may be mistaken for neurogenic arthropathy[4] (Fig 3).

Treatment depends on the causative organism. Actinomycotic soft tissue infections are usually treatable with antibiotics while mycotic infections are more resistant to antifungal agents[3]. Once bone is infected, surgical excision is necessary[5]. Therefore the early radiological detection of bone infection is important for correct patient management.

REFERENCES

1. Magoub ES, Murray IG. The History of Mycetoma. London: W. Heineman Medical Books. 1973:1-5.
2. Cockshott P, Middlemiss H. Clinical Radiology in the Tropics. Edinburgh: Churchill Livingstone. 1979: 55-9.
3. McGinnis MR, Fader RC. Mycetoma: a contemporary concept. Infect Dis Clin North Am 1988; 23:221-6.
4. Davies AG. Bone changes in Madura Foot. Observations on Ugandan Africans. Radiology 1958; 70:841-7.
5. Lewall DB, Ofole S, Bendl B. Mycetoma. Skeletal Radiol 1985; 14:257-62.

ABSTRACT

A 40-year-old African man presented with a painful swollen right foot, with a plantar discharging sinus. Radiographs showed punched-out erosions of the metatarsals with surrounding sclerosis, consistent with Madura foot or mycetoma. The pathogenesis and radiological features of this entity are reviewed. Treatment is effective but the diagnosis is often considered late in the disease at the time of biopsy. Radiologists working in endemic regions must consider this condition in the differential diagnosis of chronic osteitis.

Keywords: chronic osteitis, fungal infection, madura foot, mycetoma, osteomyelitis.