



IMAGING FEATURES IN RADIOGRAPH, COMPUTED TOMOGRAPHY AND MAGNETIC RESONANCE IMAGING OF MADURAMYCOSIS OF FOOT.

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KEYWORDS :

INTRODUCTION

Mycetoma is a chronic, granulomatous, subcutaneous tissue infection caused by both bacteria (actinomycetoma) and fungi (Eumycetoma). Inoculation commonly follows minor trauma, predominantly to the foot and hence is seen more among the barefoot-walking populations, common in adults aged 20 to 50 years.

The hallmark triad of the disease includes tumefaction, fistulization of the abscess, and extrusion of colored grains.

The colour of these extruded grains in the active phase of the disease offers a clue to diagnosis.

Radiography, ultrasonography, MRI, cytology, histology, immunodiagnosis, and culture are tools used in diagnosis.

Case History:

A 45-year-old female presented to department of Orthopaedics with complaints of pain, swelling & multiple discharging sinuses from left foot since one year. The patient was sent to department of Radiodiagnosis for radiograph of left foot & ankle, CT scan & MRI of left foot & ankle.

Procedure Details

Patient was referred for department of radio diagnosis.

Plain radiography of left foot & ankle.

16 slice Multidetector CT (SIEMENS® SOMATOM EMOTION 16) & 1.5 Tesla MRI scanner (SIEMENS® MAGNETOM AVANTO) used for diagnosis.

Findings

Radiograph:



FIG 1 (A & B): Radiograph of left ankle & foot shows soft tissue swelling around the ankle joint & foot. The tarsal bones including the calcaneum, talus, cuboid, navicular, medial cuneiform show multiple variable sized lytic lesions with cortical irregularity.

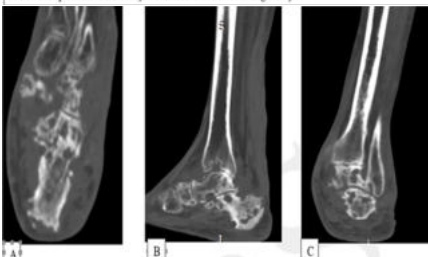


FIG 2 (A, B & C): CT scan of the left ankle & foot shows multiple variable sized lytic lesions in calcaneum, talus, cuboid, navicular, medial cuneiform, distal end of tibia & fibula with cortical irregularity & loss of normal architecture with associated soft tissue swelling around the left ankle joint & foot

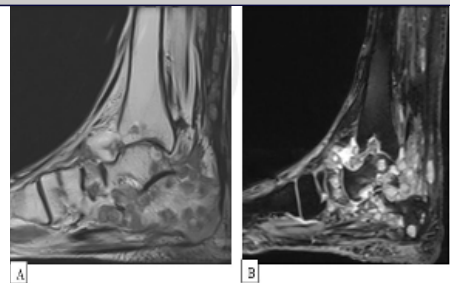


FIG 3 (A & B): MRI of the left ankle & foot T1 & T2 FS shows multiple well defined variable sized contrast T1 hypointense. T2 FS hyperintense lesions showing "Dot-in-circle" sign.

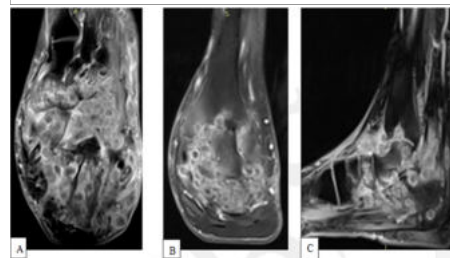


FIG 4 (A, B & C): Post contrast T1 FS shows multiple ring enhancing lesions with mild enhancement of the tarsal bones, distal tibia & fibula, surrounding muscles & soft tissues of distal 1/3rd of the left leg, ankle & foot.

DISCUSSION:

Mycetoma or Madura foot is a chronic granulomatous infection of the dermis and epidermis caused by the bacteria Actinomyces (Actinomycetoma) or by true fungi (eumycetoma).

The infecting organism is usually directly inoculated after penetration of the skin with a sharp object.

Patients present with painless subcutaneous nodules and fistulae, from which a purulent exudate are seen.

The process can lead to potential for abscess formation, draining sinus tracts, osteomyelitis, and fistula formation with severe deformity and disability ensuing if treatment is not provided. In the presence of the typical clinical features of the discharge, the colour of grains can be suggestive of the type of mycetoma.

The grains of eumycetoma are usually black or pale, while those of actinomycetoma are white, yellow or red.

The various radiographic findings in cases of Madura foot are soft tissue swelling, bone sclerosis, bone cavities, periosteal reaction, bone expansion, extrinsic cortical scalloping, and regional osteoporosis.

The bones are almost always affected from the outside. Eumycotic lesions tend to form a few cavities in bone that are ≥ 1 cm in diameter, while actinomycetes form smaller but more numerous cavities, demonstrating a moth-eaten appearance.

Initial reports of the MRI findings of mycetoma were described as low

signal on T1W and T2W images, which were assumed to be due to susceptibility from the metabolic products of the 'grains'.

The "dot-in-circle" sign, seen as tiny hypointense foci within the hyperintense spherical lesions, was initially described by Sarris et al in 2003 on T2W, STIR, and T1W fat-saturated gadolinium-enhanced images.

Correlating the MRI and histological findings, they suggested that the high-signal areas seen on MRI represented inflammatory granulomata, the low-intensity tissue seen surrounding these lesions represented the fibrous matrix, and the small central hypointense foci within the granulomata represented the fungal balls or grains.

"Dot in circle" appearance was suggested to be a highly specific sign for mycetoma

CONCLUSION:

Mycetoma is a chronic granulomatous disease affecting mainly the feet.

MRI shows tiny hypointense foci within the hyperintense spherical lesions seen as "Dot in circle" appearance considered to be highly specific sign for diagnosis of mycetoma

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