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CHRONIC FUNGAL INFRAPATELLAR BURSITIS WITH DOT IN CIRCLE SIGN ON MRI: A CASE REPORT

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ABSTRACT
Mycetoma is a chronic granulomatous disease common in tropical regions. Although histopathology and microbiology provide a definitive diagnosis, it is time-consuming and may delay the treatment. The delay in diagnosis may need amputation as a part of treatment of mycetoma. The dot-in-circle sign is considered highly specific sign in magnetic resonance imaging and ultrasound which allows noninvasive and early diagnosis of mycetoma. We present a case of histopathologically proven eumycetoma of infrapatellar bursa that showed dot-in-circle sign.
KEYWORDS: Dot-in-circle, magnetic resonance imaging, eumycetoma.

INTRODUCTION
Eumycetoma is a chronic granulomatous infection caused by fungi, leading to destruction of soft tissue. It is a disease of the tropical and subtropical region and was first described by Gill in 1842, from a clinic in Madurai, India.[1] The disease mostly affects the feet and lower leg (hence the synonym Madura foot) which are more susceptible to trauma and penetrating injuries- the portal for the entry of organisms. The term "mycetoma" was coined by Carter in 1880.[2]

Madura foot can be caused by either of two organisms, the Eumyces, or true fungi (eumycetoma), or Actinomyces, filamentous bacteria of the Order actinomycetes (actinomycetoma).[3] It is a localized, chronic, suppurative infection characterized by exuberant granulation tissue and discharging sinuses and later in the course of disease there may be involvement of bone. Early clinical diagnosis before the appearance of discharging sinuses is difficult as the entity may clinically mimic a chronic infection.[3] The recently described "dot in circle sign" on magnetic resonance imaging (MRI) is easy to recognize and specific to this condition and establishes the role of MRI in early diagnosis.[4,5,6] We present a case of mycetoma of infrapatellar bursa who presented with history of discharge of blackish granules and showed typical “dot in circle” appearance on MRI.

CASE REPORT
A 27-year-male complained of painless swelling around the knee for 2 years. He was nondiabetic and nonimmunocompromised. The patient gave a history of discharge of blackish granules from the region of swelling. There was no history of fever. Physical examination revealed the swelling in the infrapatellar region of knee. General examination, blood and serum biochemistry were also unremarkable. Plain radiograph of the knee showed well defined mild soft tissue swelling in infrapatellar region as shown in figure 1.

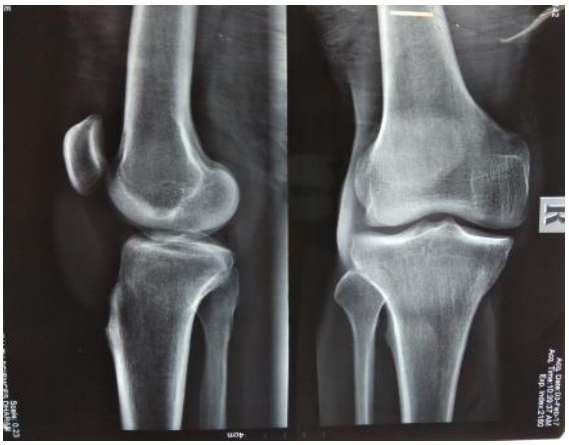

Figure 1: X ray knee AP and lateral view showing soft tissue swelling in the region of infrapatellar bursa.

USG showed mild fluid collection with echoes in superficial infrapatellar bursa with multiple echogenic foci within.

MRI was done to further evaluate the lesion and to know the exact extent of the disease. On MRI, there was evidence of mass of synovial thickening of superficial infrapatellar bursa with surrounding soft tissue

inflammation. On T2 weighted sequences, the mass showed clumped areas of multiple, small 2–5 mm round hyperintense areas, separated by a thin rim of low-signal-intensity in the superficial infra-patellar bursa of knee. Within some of these hyperintense areas, there was a central low-signal-intensity foci, giving typical 'dot in circle' appearance. The MRI findings are shown in figure 2. Minimal effusion was noted in knee joint. On the basis of MRI findings, the diagnosis of chronic fungal bursitis possibly Eumycetoma was considered and a biopsy was performed. Overall histopathological features were those of Eumycetoma.

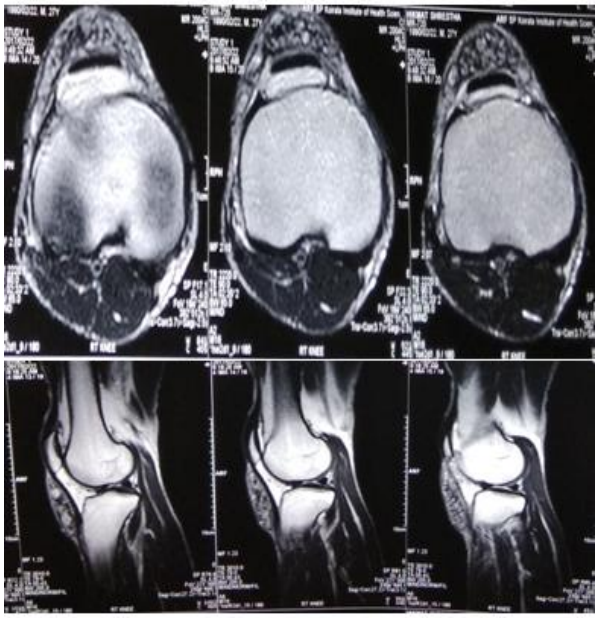

Figure 2: Axial and sagittal T2W images of knee in a case of eumycetoma showing conglomerates of round hyperintense lesions, representing the granulation tissue, surrounded by low-signal-intensity rim, representing intervening fibrous septa and some lesion with central low-signal intensity dot susceptibility effect caused by the presence of fungal grains giving typical 'dot in circle' appearance.

DISCUSSION

Mycetoma usually involves lower leg and foot and rarely head or back. Infection occurs by direct implantation of organisms from soil secondary to a penetrating injury. Mycetoma is characterized by the formation of aggregates of the organism in the form of granules, which are found within abscesses surrounded by granulation tissue.[7]

Although, histopathology and microbiological culture of the discharge from the lesion gives the definitive diagnosis both are time-consuming procedures and cause delay in treatment.

The plain X-ray may show non-specific findings like soft tissue swelling, bone sclerosis, cavities, periosteal reaction, bone expansion, extrinsic cortical scalloping and osteoporosis.[8]

Ultrasound features were initially described by Fahal *et al*.[9] The ultrasound may show grains as numerous, sharp hyper-reflective echoes with thick-walled cavities in eumycetoma whereas in actinomycetoma, hyper-reflective echoes are fine and commonly settle at the bottom of the cavities.

MRI findings specific to the diagnosis of this condition helps in early diagnosis of eumycetoma and to differentiate it from other similar clinical conditions. This is likely because of the typical appearance seen in T2 weighted sequences on MRI where clusters of small round hyperintense areas of granulation tissue, surrounded by thin rim of low-signal-intensity area representing the fibrous septa are noted. The central low-signal intensity dot is due to susceptibility effect caused by the presence of fungal grains. This specific appearance is found to be highly suggestive of mycetoma. This appearance has been very rarely described in the literature. It was first described by Sarris et al who described mycetoma as 'dot-in-circle' appearance involving the soft tissues of the foot.[5,6]

CONCLUSION

Typical clinical history of discharging black granules and dot-in-circle sign in magnetic resonance imaging are considered highly specific features which allows for noninvasive and early diagnosis in mycetoma and therefore appropriate management.

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