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CASE REPORT

Migratory Transient Osteoporosis of Foot and Ankle: A Rare Cause of Foot and Ankle Pain

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ABSTRACT

BACKGROUND

We describe a bone marrow edema (BME) involving the talus, which kept shifting to other tarsal bones. A 55-year-old female presented with pain in the right ankle without any history of trauma. The symptoms did not improve, and the initial MRI showed bone marrow edema involving the talar head, which later shifted consecutively to the cuboid, fifth metatarsal, and talar dome. We managed this case with protected weight bearing, analgesics, vitamin D, Calcium, and Alendronate. She was completely symptom-free at 11 months of follow-up.

KEYWORDS

Shifting bone marrow edema, Transient osteoporosis of foot, Transient osteoporosis of ankle

INTRODUCTION

Transient osteoporosis is a self-limiting condition of unknown etiology that resolves with time.[1-4] In 1959, this condition was first described by Curtiss and Kincaid as transitory demineralization of the hip.[5] Subsequently, in 1968, Lequesne coined the term transient osteoporosis of the hip.[6] The proximal femur is the most common bone involved, but similar radiological findings were also observed in other lower limb joints, such as the knee and ankle joints.[2,4,7] Transient osteoporosis of the foot and ankle is a rare entity, and shifting BME patterns are even rarer.[8-10]
This case report describes a case of shifting BME within the talus and in other tarsal bones.

CASE REPORT

A 55-year-old female presented to us with pain in the right ankle for one month, which was not relieved by analgesics. The pain was insidious in onset, mild, dull aching worsened with activities. She had no history of trauma, any constitutional symptoms, or any medical comorbidity. Her general condition was normal. She was walking with a limp. On examination, there was tenderness at the talar head. Radiographs and blood investigations were done to identify possible causes. AP and lateral radiographs of the ankle were normal (Figure 1), and blood investigations (CBC, ESR, CRP, Uric acid, RA factor, AntiCCP, Vitamin D, Serum Calcium, Alkaline Phosphatase, RFT) were within normal limits except vitamin D which was 26 (normal 30-100).

Fig. 1: Normal AP & Lateral radiographs of the ankle

An ankle MRI showed diffuse marrow edema, which was more pronounced in the talar neck, head, and talonavicular joint. (Figure 2).
As other investigations were normal, we managed her as a case of transient osteoporosis. We advised her for protected weight bearing along with analgesics, vitamin D and Calcium. She came for a follow-up after a week with no improvement in symptoms. We advised core decompression to decrease the intraosseous pressure and to obtain a bone biopsy, but she was lost to follow-up. She again showed up after 4 months with the same symptoms. She had already visited multiple centers where she had done another MRI (Figure 3), which showed BME at the cuboid and

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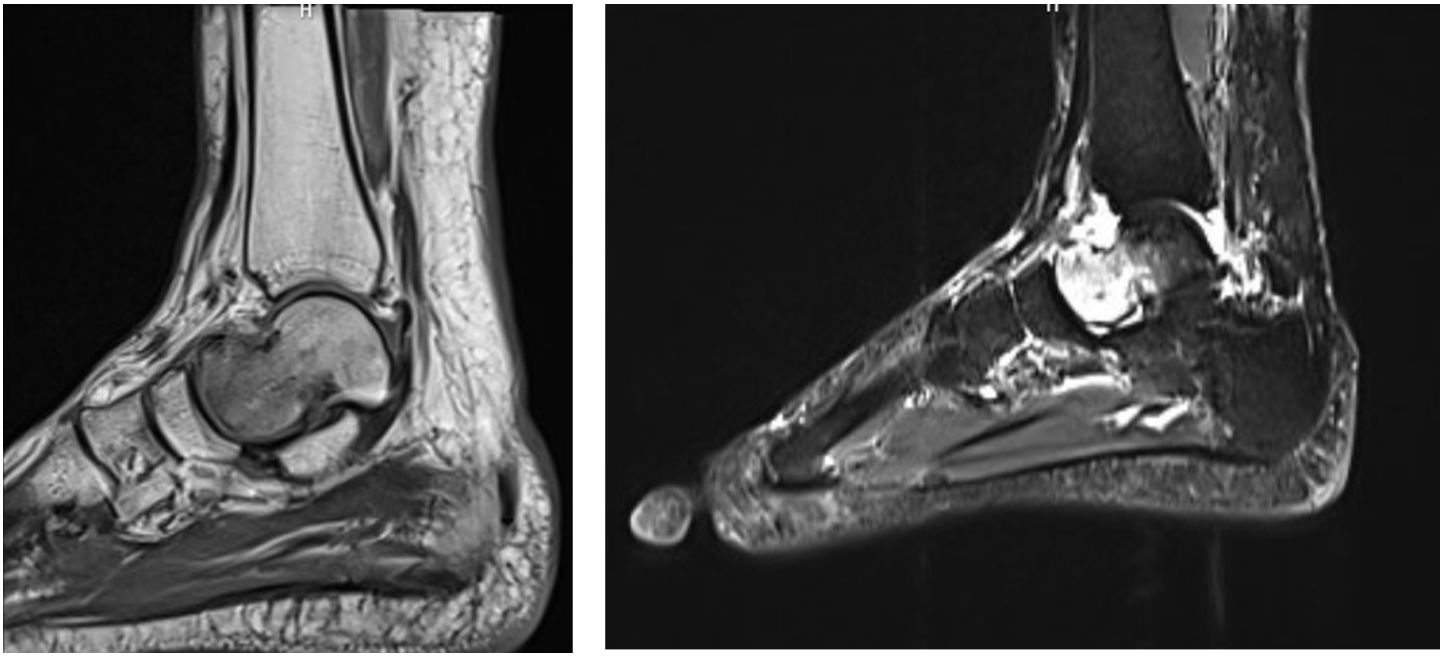

Fig. 2: Sagittal T1 W MRI image showing low signal intensity and sagittal PDFS image showing high signal intensity in talar head and neck suggestive of marrow edema.

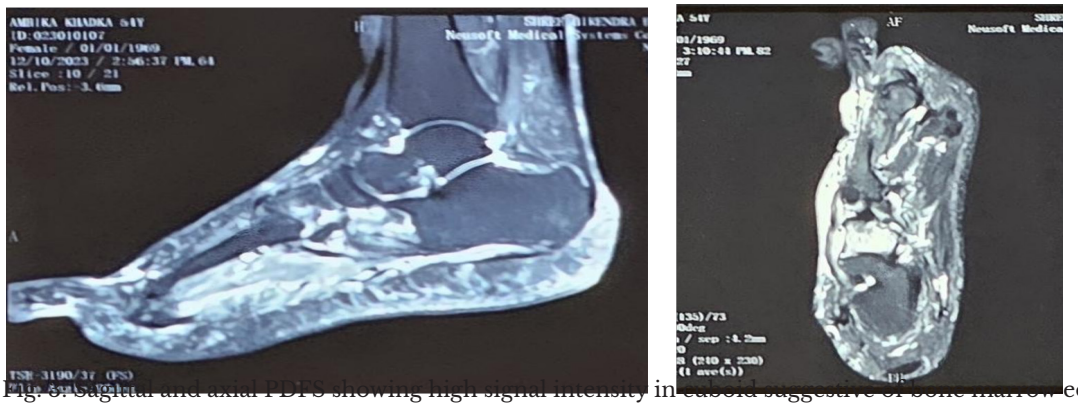

Fig. 3: Sagittal and axial PDFS showing high signal intensity in cuboid suggestive of bone marrow edema.

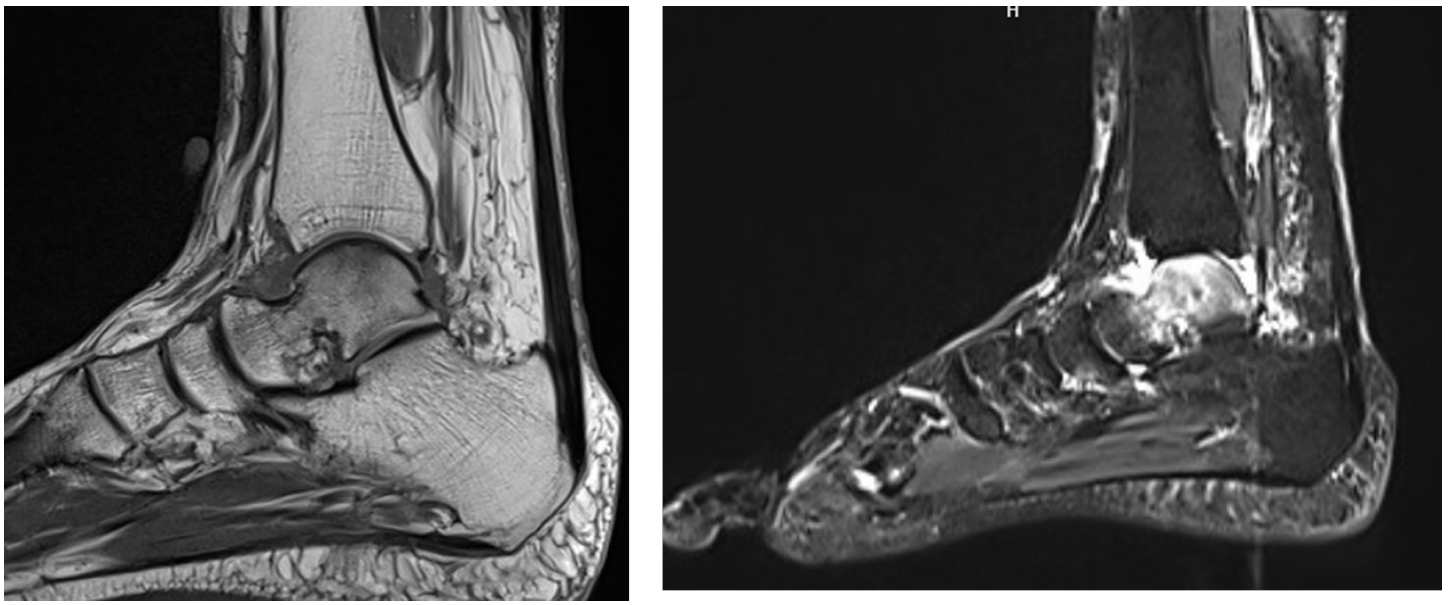

Fig. 4: Sagittal T1 W image and Sagittal PDFS image showing low and high signal intensity in the talar neck and dome suggestive of bone marrow edema.

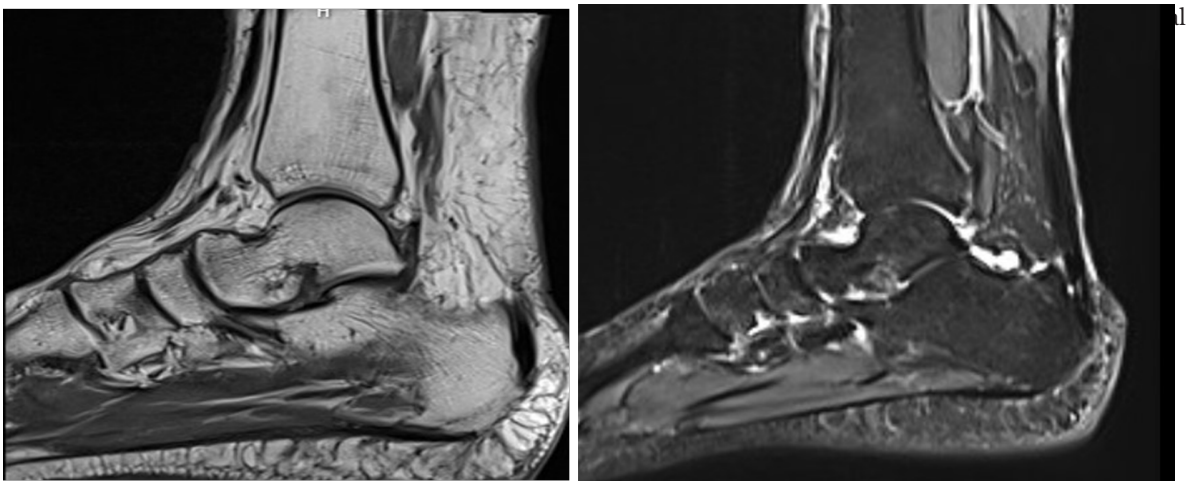

Fig. 5: BME was completely resolved except for subarticular edema at the medial aspect of a talar dome

and complete resolution of BME at the talus, which was clinically related to localized tenderness of the affected anatomical sites. She had not taken any medication in between except analgesics. We again advised her for protected weight bearing, analgesics, vitamin D, Calcium and Alendronate (70 mg weekly). Her symptoms improved, but she came back with pain in the right ankle after a month. This time, the tenderness was at the talar dome, and the third MRI (Figure 4) showed diffuse BME in the neck and body of the talus with no marrow edema at the cuboid and fifth metatarsal.

We counseled the patient regarding the condition and advised her to continue the same treatment. At 9 months, she was symptom-free, and on repeat MRI (Figure 5), the ankle effusion and marrow edema seemed to be completely resolved except for subarticular edema in the medial aspect of the talar dome. Finally, at 11 months of follow-up, she was completely symptom-free, and the clinical examination was normal.

DISCUSSION

Transient osteoporosis of the foot and ankle is a rare disorder, and shifting BME is an extremely rare condition. This should be differentiated from avascular necrosis, infection, neoplasm, stress fracture, and reflex sympathetic dystrophy. [11]Talus is the most commonly involved bone in the foot and ankle. Most studies reported isolated talus involvement, whereas few reported shifting BME patterns.[8,9,10,12,13]

Ragab et al. described a case of shifting BME where initial involvement was observed in the talus dome, which had shifted anteriorly.[13] In our case, the initial involvement was seen in the talar neck, which shifted to the cuboid and fifth metatarsal base, and finally, the talar dome.

Chowdhury et al. also described a migratory osteoporosis where BME was initially observed in the cuboid and fifth metatarsal, which later shifted to the posterior calcaneus.[14] The shifting pattern involving different bones is similar to our case, but the bones involved were the talus, cuboid, and fifth metatarsal.

Detailed history, clinical examination, and radiological findings can help differentiate transient osteoporosis from other possible diagnoses. Usually, patients present with acute onset of and is not associated with a history of trauma or infection.[1-4,7]

In our case, too, the patient presented with an acute onset of pain, which was not relieved with analgesics initially, although it gradually subsided. She did not give any history of trauma or infection.

Laboratory parameters are non-diagnostic, but the X-ray shows osteopenia, and the MRI reveals BME.[8,9,12,15-18] In this case, the laboratory parameters were normal, and the MRI showed BME initially in the talar neck, which shifted to the cuboid and fifth metatarsal and finally involved the talar dome.

Transient osteoporosis is of unknown etiology, but some authors believe that it could be due to neurogenic compression, whereas others believe it to be due to impairment of venous return leading to local hyperemia.[19,20]

The most widely accepted theory, proposed by Frost and Macclean et al. is based on the regional acceleratory phenomenon.[21,22] Under a noxius tissue stimulus, the ordinary biological processes such as blood flow, cell metabolism and turnover, and tissue modelling and remodelling are generally accelerated. Prolonged or exaggerated regional acceleratory phenomenon, in which a large number of bone turnover foci are activated, is the cause of transient osteoporosis.[22]

Although treatment options for transient osteoporosis of the hip and knee have been well described, no specific treatment has been proposed for foot and ankle osteoporosis. In the literature, the treatment options vary from symptomatic management to pharmacological treatment and surgical intervention.[10,15,22] As pain is caused by increased intramedullary pressure, core decompression has been recommended to reduce the duration of symptoms.[23,24]

We managed our case with protected weight bearing in walker boots, analgesics, vitamin D, and alendronate.

Most patients improve clinically and radiologically within 2 years.[22,25] In our case, the patient was completely symptom-free at 11 months.

CONCLUSION

Migratory transient osteoprosis (MTO) is a rare cause of unexplained foot and ankle pain. When the symptoms of the

relatively more commonly diagnosed BME of the talus do not resolve in a few months, and it shifts to other anatomical sites in the foot and ankle, it will be useful to keep MTO in mind.

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