

## Case Report

# An Unusual Cause of Ankle Pain in a Pediatric Patient – Isolated Transient Bone Marrow Edema of the Talus - Case Report and Review of Literature

Vijay Satyanarayana<sup>1</sup>, Aamer Iqbal<sup>2</sup>, Aditya Sharma<sup>2</sup>, Rajesh Botchu<sup>2</sup>

<sup>1</sup>Department of Radiology, Orange Imaging Centre, Vijaywada, Andhra Pradesh, India, <sup>2</sup>Department of Musculoskeletal Radiology, Royal Orthopedic Hospital, Birmingham, West Midlands, England.



### \*Corresponding author:

Rajesh Botchu,  
Department of  
Musculoskeletal Radiology,  
Royal Orthopedic Hospital,  
Birmingham, West Midlands,  
England.

[drbrajesh@yahoo.com](mailto:drbrajesh@yahoo.com)

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## ABSTRACT

Transient osteoporosis of the talus is an uncommon condition of unknown etiology that is characterized clinically by ankle pain without a history of trauma. We present a case of isolated transient bone marrow edema of the talus in a pediatric patient which is the youngest described in the literature.

**Keywords:** Transient, Edema, Talus, Bone marrow

## INTRODUCTION

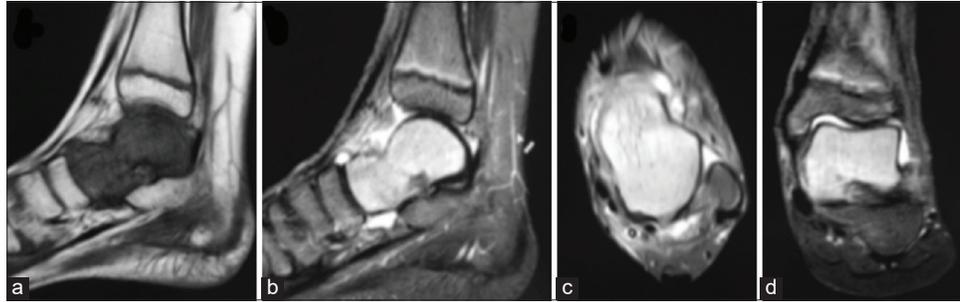
Transient osteoporosis of the talus is an uncommon condition of unknown etiology that is characterized clinically by ankle pain without a history of trauma. This is very difficult to distinguish from osteonecrosis, stress fracture, reflex sympathetic dystrophy, infection, or tumor. We present a case of isolated transient bone marrow edema of the talus in a pediatric patient which is the youngest described in the literature.

## CASE REPORT

A 7-year-old child presented to the outpatient department of the orthopedic clinic with complaints of pain in the ankle and foot region. The pain was insidious in onset, dull aching in nature without any associated swelling. Pain score was 6 out of 10 by visual analog scale. There was no history of trauma. Symptoms were relieved by anti-inflammatory and rest. Clinically, he had antalgic gait. Blood investigations (including full blood count, ESR (erythrocyte sedimentation rate), and C-reactive protein) and radiographs of the ankle were unremarkable. Magnetic resonance imaging (MRI) revealed diffuse low signal on T1 and increased signal intensity on T2/STIR (Short tau inversion recovery) of the entire talus and a small tibiotalar joint effusion. The marrow signal in the rest of the bones was normal. Articular cartilage, especially of the tibiotalar joint was preserved [Figure 1]. He was managed conservatively with analgesics and anti-inflammatories. There was complete resolution of clinical symptoms at 4 months.

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**Figure 1:** T1 sag (a), STIR sag (b), STIR axial (c), and STIR coronal (d) showing marked T1 low signal and T2 high signal involving the entire talus.

## DISCUSSION

Transient osteoporosis syndrome, alternatively transient bone marrow edema, is defined as self-limiting, painful osteopenia of the involved area with unknown etiology.<sup>[1]</sup> It was first described in the hip during pregnancy by Curtiss *et al.*<sup>[2]</sup> Soon afterward, a migratory and recurrent type of transient osteoporosis was described by Duncan *et al.* who performed a biopsy which showed decalcified trabecular bone.<sup>[3]</sup> Although the hip joint is by far the most common involved location,<sup>[4]</sup> there are reports of transient bone marrow edema involving the foot. Isolated involvement of the talus is sparse, particularly in the pediatric population.<sup>[5]</sup> Calvo *et al.* reported four cases of bone marrow edema of the foot, two of them showed involvement of the talus.<sup>[6]</sup> Judd *et al.* reported a case of isolated involvement of the talus in 2000.<sup>[7]</sup> Radke *et al.* studied ten patients with foot bones edema, eight of them involved the talus.<sup>[8]</sup> Shariff *et al.* studied ten cases of transient osteoporosis of the foot, in which talus was involved in seven of them.<sup>[9]</sup> Albrudeni had reported a case of transient osteoporosis of talus in a 54-year-old male.<sup>[10]</sup>

The diagnosis of transient osteoporosis of the talus is essentially by exclusion with a wide range of differentials as previously discussed.<sup>[9]</sup> Clinical presentation was similar in most of the cases as a sudden onset of progressive ankle pain without a history of trauma.<sup>[8,9]</sup> MR imaging is always the key for the diagnosis of transient osteoporosis, especially with unremarkable radiographs. MRI finding in our case was diffuse T2 high signal with corresponding low signal on T1 of the entire talus and was consistent with the MRI findings of five cases of foot transient bone marrow edema reported by Calvo *et al.*<sup>[6]</sup>

Treatment has been discussed in the literature to a much lesser extent compared to the transient osteoporosis of the hip and knee. Most of these cases are managed non-operatively with non weight bearing ambulation and analgesia. Some authors suggested a protected weight-bearing in a pneumatic boot for 8 weeks coupled with administration of bisphosphonates.<sup>[11]</sup> The addition of bisphosphonates reduces the average time of resolution of symptoms from 25.6 weeks down to 24 weeks

for oral bisphosphonates and to 13.8 weeks for intravenous bisphosphonates.<sup>[11]</sup> Other treatments have been described include surgical core decompression<sup>[6,8]</sup> and intravenous prostaglandin I2 analog (Iloprost).<sup>[12,13]</sup> Recurrence of transient osteoporosis of the foot has been reported to be as high as 44% at an average follow-up of 5.75 years.<sup>[10]</sup>

The differential diagnosis of TBME (Transient bone marrow edema) includes avascular necrosis, reflex sympathetic dystrophy, stress fracture, and osteomyelitis.

### Avascular necrosis (AVN)

There can be sclerosis, subchondral collapse, fragmentation, and secondary osteoarthritis depending on the stage of AVN. MR can decipher marrow abnormality even before radiographic changes. Unlike TBME, this predominantly involves the body of talus, and part of the talus will retain normal marrow signal.

### Reflex sympathetic dystrophy

Moderate-to-severe osteopenia of multiple bones is noted in this condition. On MR, there is patchy osseous edema of multiple bones along with soft-tissue edema and muscle atrophy.

### Stress fracture

Stress fracture of talus is very rare with few case reports reported in literature. These involve the body of talus, and MR is more sensitive than radiographs in diagnosing these. Osseous edema with trabecular fractures is noted on MRI depending on the stage of stress fracture.

### Osteomyelitis

Osteomyelitis of talus is extremely rare. X rays may demonstrate osteopenia in the acute and subacute with subsequent sclerosis. On MRI, there is osseous edema with or without intraosseous abscess (Brodie's abscess). Correlation with clinical history and inflammatory markers is essential to diagnose this in their early stage.

## CONCLUSION

Isolated transient bone marrow edema of talus in the pediatric population is extremely rare with a non-specific clinical presentation and a wide differential diagnosis. MRI is the gold standard for diagnosis.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms.

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## Conflicts of interest

There are no conflicts of interest.

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