

## Case Reports and Series

# Acute Primary Hematogenous Osteomyelitis in the Epiphysis of the Distal Tibia: A Case Report With Review of the Literature



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## ABSTRACT

Osteomyelitis originating in the epiphysis of the long bones is quite rare and is usually found at either the distal femur or the proximal tibia. We report the case of a 12-year-old male with epiphyseal osteomyelitis that had developed in the distal tibia. To the best of our knowledge, this is the first published case report. The patient's history of a trauma that resembled an ankle sprain had delayed the diagnosis and subsequently led him to develop septic arthritis. The ankle is a common site of simple trauma; however, epiphyseal osteomyelitis is rare at this site. Therefore, if the symptoms continue or worsen after trauma, the clinician should check the affected site and take a more aggressive approach to make an early diagnosis.

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Acute primary hematogenous osteomyelitis is neither common nor rare (1,2). The condition usually develops in the metaphysis of a long bone (especially around the knee joint), and the typical clinical presentations lead to a rapid diagnosis (3). Osteomyelitis that primarily begins in the epiphysis of a long bone is quite rare, and the initial symptoms can be vague. This atypical presentation can result in a delayed or missed diagnosis with complications of septic arthritis and adjacent spreading abscess (4,5).

Previously reported cases of osteomyelitis in the epiphysis have been located on the distal femur or the proximal tibia (3,6). Epiphyseal involvement of the proximal femur has been reported with a lower frequency (7). The primary epiphyseal osteomyelitis of the proximal radius has been documented only once (8). Local trauma is implicated as a contributing factor to the development of osteomyelitis (9,10). A history of local trauma and treatment of vague symptoms can hinder the proper and early diagnosis of osteomyelitis.

We present the first case of acute osteomyelitis in the epiphysis of the distal tibia in a 12-year-old male. He had a history of ankle trauma and had initially been treated with immobilization with a splint under the suspicion of an ankle sprain. Acute osteomyelitis of the distal tibial epiphysis was not diagnosed for 10 days after the onset of symptoms, and the patient was transferred owing to the combination of symptoms and a septic joint.

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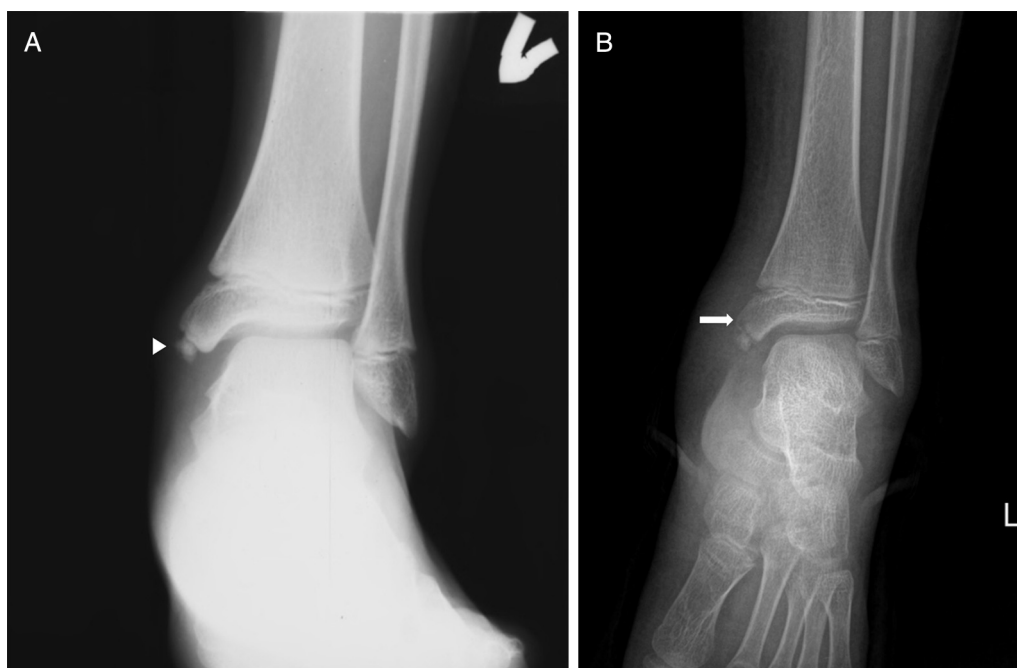
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## Case Report

A 12-year-old male reported pain in the left ankle after falling down while playing soccer. When he visited a private clinic 2 days after the trauma, the medial aspect of his left ankle was swollen and tender. He had no open wounds around the ankle. His recent history included no respiratory or other infection or dental treatment. Initially, the boy had been diagnosed with a medial ligament sprain of the ankle. He was instructed to apply ice and a short leg splint to the ankle. However, the patient continued to experience ankle pain, and he visited the clinic again 1 week after the trauma had occurred. His symptoms were aggravated, with gross moderate swelling and erythematous changes. However, the treatment regimen was not altered at the second visit. Finally, 9 days after the trauma, he became febrile, with a temperature of 38.3°C and complained of more severe pain in his medial malleolus area. The patient's parents brought him to our emergency department. At that time, he could not walk or move his left ankle owing to the severe pain. He had erythema, tenderness, and swelling over the medial malleolus. Plain radiographs showed soft tissue swelling in the medial portion of the left ankle and the small bony ossicle below the medial malleolus: the os subtibiale. Radiographs also revealed a poorly defined, irregular osteolysis adjacent to the os subtibiale in the distal epiphysis of the tibia (Fig. 1). Clinically, ankle joint effusion was suspected. The ankle joint fluid was aspirated and analyzed. The joint fluid was yellow and turbid. The synovial white blood cell count was 68,000/mm<sup>3</sup>, with 90% neutrophils. The most significant laboratory value on admission was an elevated serum leukocyte count of 13,300/μL. The erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) were 52 (range 0 to



**Fig. 1.** (A) Radiograph taken at another hospital immediately after the trauma showed no specific bony abnormality except for the os subtile (*arrowhead*). (B) The radiograph obtained 10 days after trauma showed poorly defined, irregular osteolysis (*arrow*) in the distal epiphysis of the tibia adjacent to the os subtile.

15) mm/hr and 115 (range 0 to 3) mg/L, respectively. Distal tibia epiphyses osteomyelitis with septic arthritis was suspected. The patient was started on intravenous nafcillin (500 mg every 6 hours) immediately after blood culture samples were obtained.

Magnetic resonance imaging showed a round osteolytic lesion at the distal epiphysis of the anterior aspect of the tibia with bone marrow edema, adjacent soft tissue abscess, and increased joint effusion at the left ankle joint. We also noted a fluid collection along the tendon sheath of the posterior tibialis and flexor digitorum longus (*Fig. 2*). The patient was taken emergently to the operating room and underwent arthroscopic examination of the ankle joint. We observed hyperemic and hypertrophic synovitis on the medial and lateral gutter (*Fig. 3*). These tissues were debrided after examination. However, the fistula between the abscess and the ankle joint could not be identified on arthroscopic examination. Next, we made a 3-cm-size longitudinal incision at the medial malleolus area. Suppurative

discharge drained from the subcutaneous abscess as soon as we made the incision. Biopsy specimens for histopathologic examination and culture were taken at that site. The medial cortex of the medial malleolus had 2 tiny holes (*Fig. 4*). Through the holes, the distal tibia epiphysis was curetted and irrigated. The bone abscess was not located across the physis. We were unable to identify a connection between the bone abscess and the joint. The wound was closed over a drainage tube that was left in place for 48 hours. The cultures taken from the wound and joint fluid intraoperatively grew *Staphylococcus aureus*. A definitive diagnosis of acute osteomyelitis was then made from the histopathologic examination results of the curetted bone (*Fig. 5*).

The patient continued to receive intravenous antibiotics and had become afebrile by the third postoperative day. At 2 days postoperatively, his peripheral leukocyte count was 5,800/ $\mu$ L, and the ESR and CRP had decreased to 28 mm/hr and 70 mg/L, respectively.



**Fig. 2.** (A and B) Magnetic resonance T<sub>1</sub>-weighted enhanced image revealing a round, osteolytic lesion at the distal epiphysis of the anterior aspect of the tibia with the bone marrow (*arrows*) and (C) adjacent soft tissue abscess (*arrowhead*).

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