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## Case Reports and Series

## Split Fracture of the Posteromedial Tubercle of the Talus: Case Report and Proposed Classification System

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## ABSTRACT

We describe a rare case of a fracture of the medial tubercle of the posterior process of the talus in a 16-year-old male athlete who fell during basketball practice. The patient presented to our orthopedic clinic when pain and swelling had persisted despite 2 weeks of anti-inflammatory medication and rest. Computed tomography and magnetic resonance imaging scans revealed a fracture of the posteromedial tubercle of the talus and a small amount of retained fluid in the joint. Immobilization with a below-the-knee cast and non-weightbearing for 4 weeks, with a gradual return to full activity, was successful. At the 1-year follow-up evaluation, the patient expressed no complaints. Fracture of the posteromedial tubercle of the talus will usually result in a misdiagnosis or delayed diagnosis owing to the insidious onset of symptoms. We believe the present fracture configuration resulted from the vertical compression force that occurred on landing by posterior medial ankle impingement in plantarflexion-supination, modifying the conventional concept of the posteromedial tubercle fracture. We also present a suggested classification with a flowchart diagram.

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Fracture of the posteromedial tubercle of the talus, also known as Cedell's avulsion fracture or Cedell's fracture, was first described by Cedell (1) in 1974. It is a rare injury characterized by an insidious onset of symptoms, and the etiology has not been established. In the present report, we describe a case involving a fracture of the posteromedial tubercle of the talus that did not appear to be an avulsion-type fracture owing to the posterior displacement of the fracture fragment and the injury mechanism.

### Case Report

A 16-year-old male athlete presented to the emergency department of our hospital complaining of right posteromedial ankle pain and swelling after basketball practice.

Physical examination revealed tenderness over the deltoid ligament. He reported that he had sprained the right ankle on several previous occasions and also confirmed that all the sprains had been sustained while actively playing basketball. He was a member of the basketball club at a senior high school and practiced basketball for

3 hours a day, 7 days a week. Standard radiographs were taken, and no definitive abnormal findings were observed (Fig. 1). The emergency department physician diagnosed a right ankle sprain and prescribed anti-inflammatory medication, loxoprofen sodium 60 mg, twice daily. The patient walked home without cast or splint immobilization.

The patient returned to our outpatient orthopedic clinic 2 weeks later with unalleviated pain in the posterior ankle. He had been unable to return to sports activities and reported that the ankle felt unstable. When questioned for specifics of the injury 2 weeks earlier, the patient explained that the injury had occurred when he had landed in plantarflexion-supination. On physical examination, the posteromedial pain in the ankle was intensified by forced plantarflexion (but not dorsiflexion). Stress radiographs were obtained and showed no ankle instability. We then scheduled magnetic resonance imaging (MRI) and computed tomography scans of the right ankle for more precise examination and assessment.

A fracture of the posteromedial tubercle of the talus and a small amount of retained fluid in the joint were found on the computed tomography and MRI scans, 3 weeks after his initial presentation to our hospital (Figs. 2 and 3). The posterolateral tubercle of the talus appeared to be intact with no signal abnormalities. Further physical assessment revealed pain with resistance against motion of the right hallux. We decided to treat him conservatively because the fracture displacement was minimal (1 to 1.5 mm measured on the computed tomography scan). He refused treatment with cast immobilization;

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**Fig. 1.** Initial radiographs at the emergency room showing no widening of medial joint space and ankle mortise on (A) anteroposterior and (B) lateral views.

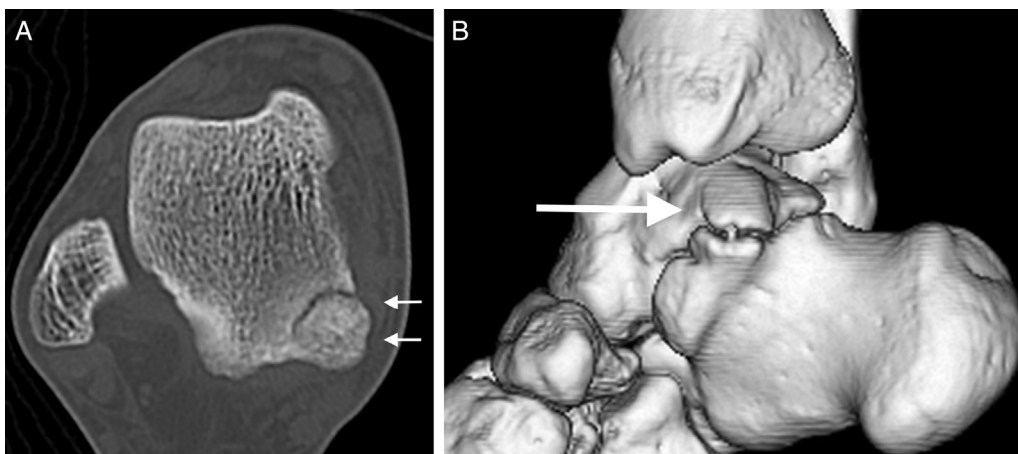
therefore, we prescribed a stabilizing ankle brace. He could walk well with the brace, although a small amount of tenderness and swelling of the medial ankle was present.

At 3 weeks after bracing, he continued to have posteromedial ankle pain with jumping and landing, despite the resolution of the swelling, tenderness, and apparent restriction of hallux motion. At that visit, we applied a below-the-knee cast and instructed the patient to maintain non-weightbearing. After 4 weeks of casting, 50% partial weightbearing was allowed, with a support brace, and 1 week later, full weightbearing was allowed. Two weeks after full weightbearing (3 months after his initial presentation to the emergency department), he started running exercises and resumed his full activities, including basketball practice.

A follow-up MRI scan was taken after 3 months of full activity, and no definite signal abnormalities were observed (Fig. 4). The patient was complaint free, with no complications found, at the 1-year follow-up examination. The patient and his parents gave informed consent for the publication of the present case report.

### Discussion

Fracture of the posteromedial tubercle of the talus is a rare injury relative to the high incidence of ankle sprains, which has an incidence of 1 per 10,000 individuals daily (2). Furthermore, the understanding of this fracture has not evolved for decades, despite its potential for misdiagnosis or delayed diagnosis (1,3–6). The other reasons for the



**Fig. 2.** (A) Axial slice of the initial computed tomography scan showing the fracture of the posteromedial tubercle. (B) Three-dimensional reconstruction showing the slightly displaced posteromedial tubercle fracture.

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