

Open Axial and True Vertical Ankle Dislocation Without Malleolar Fractures: A Case Report



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ABSTRACT

Tibiotalar dislocation is rare and usually associated with a high-velocity, high-energy impact or extreme sporting injuries. I describe complete tibiotalar dislocation from an unusual mechanism. A 22-year-old mechanic was sitting under a hydraulic lift when it began to leak, lowering the engine on which he was working onto his right lower thigh. This heavy load, without rotational force or high-velocity impact, was transmitted down his foreleg. Because his foot was fixed to the ground, the talus was proximally and vertically displaced, and the distal tibia was forced to the ground, beside his foot, and was contaminated with sand and grease. The circumferential ligament complexes and capsule were completely transected, but, despite a severely disrupted dorsal and capsular blood supply, talar vasculature remained adequate. In the emergency department, gentle traction restored impaired circulation. No malleolar fractures were seen. The wound was meticulously irrigated with saline and povidone-iodine and debrided. Cefepime, 2 g, was given twice daily. In surgery, the unstable joint was transfixed with two thick Kirschner wires, passed retrograde. Interrupted sutures were placed in the anterior capsule and anterior third of the lateral ligament without additional incisions. The wound healed aseptically. The Kirschner wires were removed at 6 weeks. The joint space was only minimally reduced. He returned to work after 4 months. His ankle-hindfoot score was 90/100 at 18 months, he could jog at 24 months, and he was still asymptomatic at 36 months. The case illustrates the importance of preserving talar circulation and treatment within the “golden hour.”

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Ankle dislocations without fractures of the medial malleolus, lateral malleolus, anterior or posterior lip of the distal tibial articular surface, and the diastasis of ankle syndesmosis, termed *pure ankle dislocations* or *ligamentous dislocations*, are rare. Even rarer, however, are tibiotalar dislocations, especially open dislocations. The first radiologically documented case of tibiotalar dislocation was reported by Péraire in 1913 (1,2). Since then, only small series or isolated cases have been published. Wilson et al and Haynes reported the next 2 cases in 1939 (3,4). Only 59 cases had been reported by 1997, and only 5 were open dislocations. Of the 73 cases reported by Soyer et al (5), 8 were posteromedial dislocations. Only 10 cases of open dislocation were reported between 1998 and 2013 (6–8). Lui and Chan reported 6 cases in 2012 (9); Wang et al reported 3 in 2013 (10); and Dlimi et al (11), Lazaretto et al (12), and Bhullar et al (13) each reported a single case from 2011 to 2013. In the present study, a case of complete tibiotalar dislocation with extrusion of the tibia and fibula and axial dislocation (or true vertical talar

displacement in proximal direction), without malleolar fractures is reported. The case was notable for the mechanism of dislocation and for preserving talar circulation. A 3-year follow-up is presented.

Case Report

A 22-year-old male truck mechanic was sitting on a low stool under a hydraulic lift with his knees flexed. The lift started losing pressure, and the engine on which he had been working slowly descended onto his right lower thigh. His foot was fixed to the ground, probably in plantarflexion, and the dropping engine trapped him under its weight. The traumatic force was thus a low-velocity, low-impact heavy load without rotational stress that was transmitted down the axis of his foreleg onto the plantarflexed ankle, ejecting the tibia and fibula from the tibiotalar articulation. Because the foot was fixed to the ground, the talus was proximally and vertically displaced, placing the end of his foreleg and foot side-by-side on the ground. Consequently, the wound was contaminated with gravel, sand, engine oil, and grease. The engine might have stopped descending at this point, indicating that its full weight was resting on the patient's foreleg. The engine had to be raised to extract the patient.

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Fig. 1. (A) The right foot of a 22-year-old male mechanic with a complete, open, and contaminated tibiotalar dislocation at presentation to the emergency department. The circumferential ligament complexes and capsule were completely transected. However, despite the severely disrupted dorsal and capsular blood supply, the talar vasculature remained adequate. (B) Close-up view. (C) Inferior view showing intact lateral malleolus, syndesmosis, and tibial articular surface.

The patient presented to the emergency department at Khorfakkan Hospital in United Arab Emirates within 15 minutes of the injury. Gross examination (Fig. 1) and radiographs (Fig. 2) revealed complete tibiotalar dislocation with posteromedial displacement, proximal migration of the talus along with the foot, a small fracture of the superomedial margin of the talar articular surface, intact medial and lateral malleoli, and syndesmosis.

The foot was next to the end of his lower leg posteromedially in an extreme position (Fig. 1), that is, the end of the tibia had been forced 3 to 3.5 in. below his ankle. The vasculature was impaired, as indicated by weak posterior tibial and dorsalis pedis arterial pulses. Sensation on the dorsal and medial side of the foot was blunted, presumably because of the acute angulation of the neurovascular bundle. Reduction was not attempted at this stage.

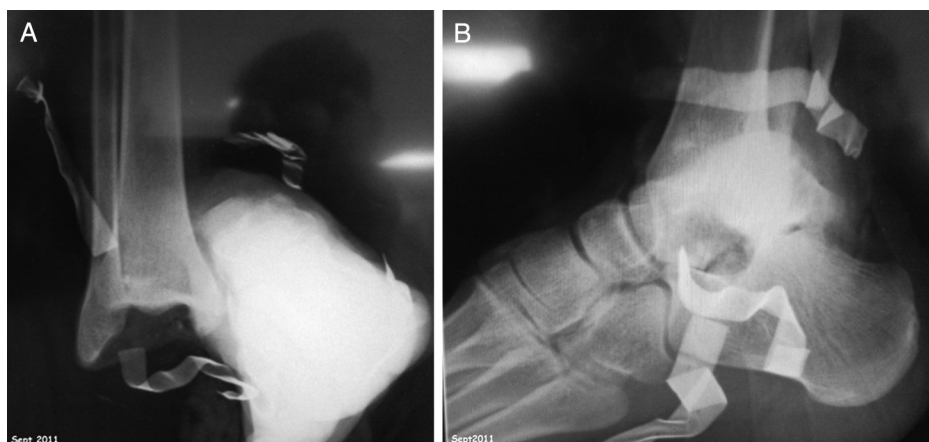


Fig. 2. Complete tibiotalar dislocation in the right foot of a 22-year-old male mechanic. Heavy axial loading on the tibia displaced the talus proximally and vertically, avulsing the end of the tibia and placing it on the ground adjacent to the rest of the foot. (A) Anteroposterior view. (B) Lateral view.

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