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Irreducible Fracture-Dislocation of the Ankle Associated With Interposition of the Tibialis Posterior Tendon in the Syndesmosis: A Case Report

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ABSTRACT

Although ankle fracture-dislocations are common orthopedic injuries, it is very uncommon for them to be irreducible, and such cases require special attention. We report the case of a closed fracture-dislocation of the ankle in a 17-year-old male that required 3 surgeries because of persistent anterior subluxation of the talus on the postoperative radiographs. After advanced radiologic investigations, tibialis posterior tendon interposition in the syndesmosis was identified as the cause of the subluxation. This is a very rare event, reported in only 5 patients in published studies. Once the diagnosis was identified by magnetic resonance imaging, the tendon was relocated to its anatomic position, and the tibiofibular and tibiotalar joints were reduced adequately. The patient was then able to regain a satisfactory level of function many months after the initial trauma.

Fracture-dislocation of the ankle is not uncommon and usually requires emergent care. Failure to achieve anatomic reduction has been the single most important cause of disability after ankle fractures. Several etiologies for the inability to reduce a dislocated ankle have been reported in English-language studies. Schatzker and Johnson (1) and Schatzker et al (2) described irreducible fracture-dislocations associated with anterior and posterior dislocation of the fibula. Coonrad and Bugg (3) described 2 cases of tibialis posterior (TP) tendon dislocation that prevented closed reduction of the ankle joint fracture: 1 in which the TP tendon and tibial nerve became entrapped in the fracture site, and 1 in which the TP tendon had slipped into the ankle joint, between the talus and an intact medial malleolus. Schepers and Hagenaars (4) described a fracture-dislocation that was irreducible owing to a fixed dislocation of a proximal fibular fragment posterior to the lateral ridge of the tibia, known as a *Bosworth fracture*.

Entrapment of the TP tendon in the syndesmosis is a known, but rarely reported, cause of irreducible fracture-dislocation of the ankle. To our knowledge, only 5 cases have been reported to date. Böhler (5) first published a case in 1936, followed by Parrish (6) in 1959. In 1981, Walker and Farris (7) described an injury mechanism in which the TP tendon was trapped in the tibiofibular joint, preventing anatomic reduction of the ankle. Anderson and Hansen (8) also reported a case in which the delay in making the diagnosis ultimately led to severe ankle arthritis and the need for ankle arthrodesis. More recently, Ermis et al (9) reported a similar case. The present case is, to our knowledge, the sixth case of irreducible fracture-dislocation of the ankle due to an isolated TP tendon interposition in the tibiofibular interosseous space.

Case Report

A 17-year-old male was admitted to the emergency department after being involved in a motor vehicle accident. He had a closed type C3 (Danis-Weber classification [10]) and a pronation-external rotation stage 3 (Lauge-Hansen classification [10]) fracture-dislocation of the right ankle (Fig. 1). His neurovascular status was intact, but he had a

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Fig. 1. (*A*) Anteroposterior and (*B*) lateral radiographs of the initial trauma showing the 44-C1 fracture type according to the Orthopaedic Trauma Association classification.

large blister anteromedially. The dislocated ankle was partially reduced under conscious sedation in the emergency department and was placed in a below-the-knee splint.

Surgery was performed on the third day after the trauma. Ankle arthrotomy was performed through an anteromedial skin incision to assess the ankle joint and to reduce and fix the medial malleolus fracture. Posteromedial and anterolateral osteochondral fragments were located and excised. The medial malleolus fracture was then anatomically reduced and fixed. A longitudinal incision was made over the distal fibula. The transverse fibular fracture was anatomically reduced and fixed. Finally, the syndesmosis was reduced and fixed with a 4.5-mm cortical screw through the plate. Retrospectively, the final fluoroscopic images demonstrated an anatomic mortise on the anteroposterior and oblique views but anterior subluxation of the talus on the lateral views (Fig. 2).

The cast was removed 6.5 weeks after surgery. Another computed tomography scan was performed. No intra-articular loose bodies were identified, but a syndesmosis malreduction was diagnosed, and anterior positioning of the syndesmotic screw appeared to potentially be the cause of this malposition.

Therefore, the patient was transferred to an orthopedic foot and ankle specialist. A second surgery was performed, nearly 2 months after the trauma. Synovitis and marked anterior soft tissue scarring were found and thoroughly debrided by way of initial ankle arthroscopy. A step in the fracture line was identified over the posterior half of the medial malleolus and was smoothed with a burr to eliminate any potential blockage of joint reduction. The flexor hallucis longus tendon was visualized in the posterior ankle and seemed to be tethered; this was associated with a contracture of the interphalangeal joint of the hallux clinically. Using a lateral incision, the single syndesmotic screw was removed, and wide dissection showed that the fibula was anteriorly malpositioned by 12 to 14 mm. Even with the fibula reduced to its anatomic position in the tibial incisura (with 1 large fragment cortical screw and 1 TightRope®; Arthrex®, Naples, FL),

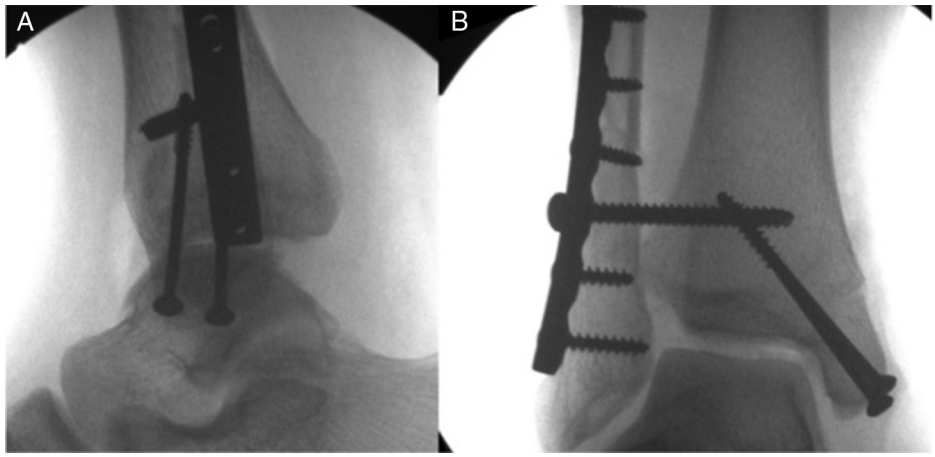

Fig. 2. (*A*) Lateral and (*B*) mortise fluoroscopic views at the end of the initial surgery. The syndesmosis was still open, and the talus was anteriorly subluxated.