

Case Report: Irreducible Ankle Fracture With Posterior Tibialis Tendon and Retinaculum, Deltoid Ligament, and Anteromedial Joint Capsule Entrapment



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ABSTRACT

Irreducible ankle fractures are a relatively rare phenomenon. We present a case of a pronation abduction-type ankle fracture that was irreducible in the emergency room despite sedation. The patient was taken to the operating room, where the posterior tibialis tendon and retinaculum, deltoid ligament, and anteromedial capsule were found to be trapped within the joint. After removal of the tissue, alignment was restored. The patient did well clinically and was advanced to full weightbearing at 6 weeks. This is, to the best of our knowledge, the first report of entrapment of all 4 anatomic structures, preventing closed reduction.

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Irreducible ankle fractures are a rare phenomenon, and entrapment of the posterior tibialis tendon even more so (1–6). We present a pronation abduction-type ankle fracture that was irreducible in the emergency room despite sedation. In the operating room, the posterior tibialis tendon and retinaculum, deltoid ligament, and anteromedial capsule were found to be trapped within the joint, preventing reduction. After removal of the tissue, anatomic alignment was restored. This case highlights a rare cause of irreducible ankle fracture, which, to the best of our knowledge, has not yet been reported.

Case Report

A 36-year-old male presented to our emergency department with an inability to bear weight and severe pain after a fall down stairs 4 days earlier. Closed reduction had been attempted at an outside hospital, but the ankle could not be reduced, and the patient was advised to undergo surgical evaluation. On physical examination, a well-molded short leg splint was in place, which was taken down. Extensive swelling and ecchymosis were present over both malleoli; however, all compartments were compressible, and he experienced no

pain with passive stretch. The neurovascular examination findings were normal. Initial radiographs were notable for subluxation of the talus laterally and malalignment of the mortise. The patient was sedated in the emergency room, and closed reduction was reattempted (Fig. 1); however, the ankle remained subluxed. Given 2 failed attempts at closed reduction, with persistent widening of the mortise, we suspected soft tissue interposition and recommended open reduction and internal fixation. In these cases, reduction should be performed as soon as possible to reduce pressure on the soft tissue envelope.

The patient was brought to the operating room. The medial side was addressed first (Supplemental Videos S1 and S2). An anteromedial arthrotomy was used to expose the medial intra-articular space. The posterior tibialis tendon was noted to be dislocated inside the joint and was removed (Fig. 2). The posterior tibialis tendon retinaculum was ruptured, permitting the posterior tibial tendon to sublux out of the tendon groove along the posteromedial aspect of the medial malleolus. The superficial and deep deltoid ligaments were completely avulsed from their proximal origin, and the proximal aspect of each was flipped inside the joint (Fig. 3A). Finally, the anteromedial joint capsule was displaced into the joint (Fig. 3B). After all interposed soft tissues had been removed, the ankle could be reduced. Before reduction, the chondral surface was examined. No significant chondral damage to the talus or tibial plafond was present.

Attention was then turned to the lateral side. In this case, the soft tissue swelling was not so severe as to preclude internal fixation; however, if the soft tissues are tenuous, an external fixator can be

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Fig. 1. (A) Anteroposterior, (B) mortise, and (C) lateral radiographs of the second reduction attempt with the patient under sedation, demonstrating persistent lateral talar subluxation and widening of the syndesmosis.

applied, and definitive internal fixation can be performed in a staged manner. The comminuted fibular fracture was fixed with one 3.5-mm cortical lag screw and a one-third tubular plate to bridge the remainder of the comminution. Fluoroscopy confirmed reduction of the fracture and ankle mortise; however, external rotation stress testing revealed syndesmotic widening. The syndesmosis was reduced under direct visualization by raising an anterior flap over the distal fibula, and 2 tricortical 3.5-mm cortical screws were placed. Repeat stress testing confirmed reduction of the

syndesmosis but revealed residual talar tilt (Fig. 4), which was attributed to the torn deltoid ligament. The deltoid ligament was repaired with a heavy braided nonabsorbable suture, and repeat fluoroscopy confirmed improvement in the talar tilt (Fig. 4). The posterior tibial tendon was reduced and the overlying retinaculum repaired. Postoperatively, the patient was kept non-weightbearing in a splint for 2 weeks. The splint was removed, and range of motion exercises were encouraged for the next 4 weeks, and he was advanced to full weightbearing at 6 weeks. The patient was followed

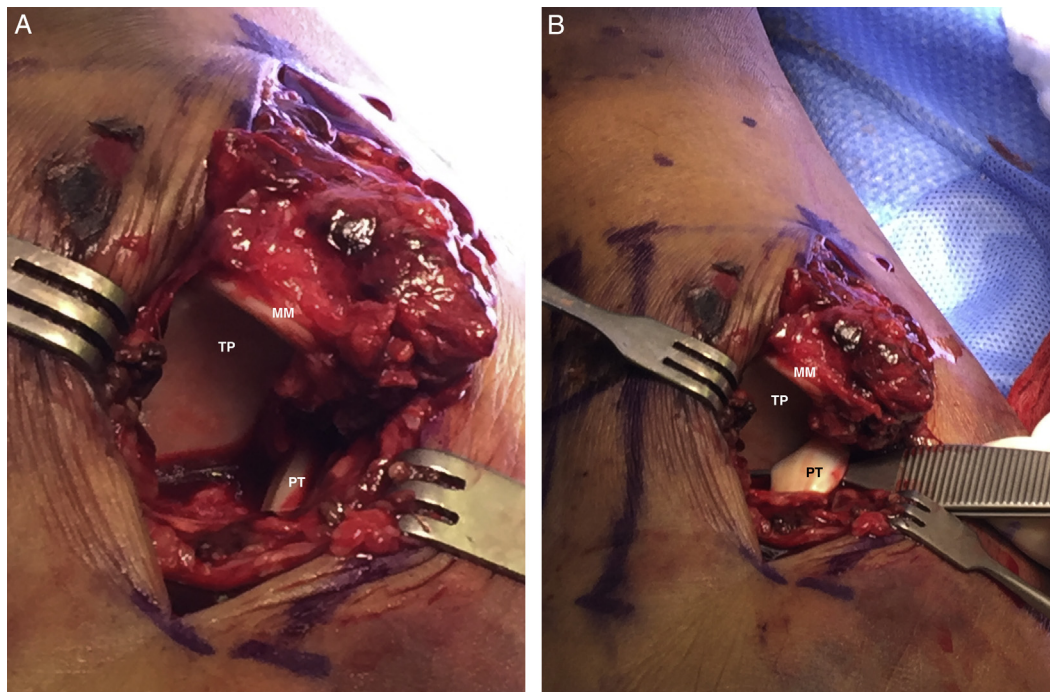


Fig. 2. Intraoperative photographs of the medial ankle. (A) When external rotation stress is applied to the forefoot, the posterior tibialis (PT) tendon will be cleared from the ankle mortise. (B) When the ankle is placed in a neutral position, the PT will become entrapped just lateral to the medial malleolus (MM). The talus (not shown) was dislocated laterally, exposing the tibial plafond (TP).

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