



## Irreducible Ankle Fracture-Dislocation Due to Tibialis Anterior Subluxation: A Case Report



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### ABSTRACT

Irreducible ankle fracture-dislocations are rare. Several cases of irreducible ankle fracture-dislocation have been reported in published studies secondary to the tibialis posterior tendon, deltoid ligament, or extensor digitorum longus tendon blocking the reduction. We report a case of irreducible ankle fracture-dislocation resulting from posteromedial subluxation of the tibialis anterior tendon around a medial malleolar fracture fragment. Ultimately, the ankle required open reduction of the incarcerated tendon to reduce the joint and proceed with internal fixation of the associated fracture. The patient's postoperative course was uncomplicated, and the tibialis anterior tendon was functioning at 10 months postoperatively, after which he did not return for follow-up examinations. To our knowledge, this is the first reported case of the tibialis anterior tendon blocking closed reduction of an ankle fracture-dislocation.

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Although the number of ankle fractures has been increasing (1), ankle fracture-dislocations remain a small subset (2). Most of these injuries will be reducible using closed methods and treated with subsequent internal fixation. Thus, sparse data is available on the recognition and management of irreducible ankle fracture-dislocations. Nonetheless, several cases of irreducible ankle fracture-dislocations have been reported. These cases differed in the obstruction to obtaining a closed reduction, such as tibialis posterior tendon interposition under an intact medial malleolus (3,4), within the medial malleolar fracture site (3), and between the tibia and fibula in the syndesmosis (5–8). Additionally, the deltoid ligament (9) or extensor digitorum tendon trapped in the distal tibiofibular joint (9), medial malleolar fragment (10), and fibular dislocation (11–14) have all been reported as causes of incomplete closed reduction of ankle fracture-dislocations. To our knowledge, we report the first case of tibialis anterior tendon displacement as the cause of incomplete closed reduction of an ankle fracture-dislocation.

### Case Report

An otherwise healthy 33-year-old male was demolishing a brick wall. When the brick wall started to fall, he jumped from a height of

approximately 5 ft and sustained a twisting injury to his left ankle. He presented to a local emergency department with a closed ankle fracture-dislocation (Fig. 1). At the outside hospital, 2 reduction attempts were made with the patient under conscious sedation, without success (Fig. 2). At that point, the patient was transferred to our institution. On presentation, the ankle skin was closed, ecchymotic, and swollen but without evidence of open or bullous compromise. He had minimal active dorsiflexion and plantar flexion of his ankle. The extensor hallucis longus tendon was functioning normally. His sensation to light touch was absent over the distal most aspect of the plantar surface of the foot but was otherwise normal. The dorsalis pedis was palpable. Palpation of the posterior tibial artery was not possible given the swelling; however, the foot and toes had normal capillary refill. Reduction was again attempted on his arrival at our institution after an intra-articular injection of 10 mL of 1% plain lidocaine. This last reduction attempt was an improvement over the previous attempts (Fig. 3) but still left the patient's ankle incompletely reduced. However, the patient's plantar surface sensation had returned to normal after the final closed reduction attempt.

The patient was admitted to our hospital and prepared for operative intervention, scheduled for the next day. Surgery was performed with the patient under general anesthesia with complete muscle paralysis in the supine position with a bump under the ipsilateral hip. A proximal thigh tourniquet was used to aid in hemostasis and visualization. Before the incision, it was noted that the ankle could not be completely reduced in the medial direction. A curvilinear incision was created over the medial malleolus and distal tibia. On inspection of the medial malleolar fracture site, the tibialis anterior tendon was

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**Fig. 1.** Anteroposterior (A) and lateral (B) radiographs of the left ankle injury taken at the outside facility.

identified posteriorly, trapped around the medial malleolar fracture fragment (Fig. 4). The medial malleolar fragment was delivered posteriorly behind the tibialis anterior tendon, releasing the tibialis anterior tendon back to its anatomic position. With the tibialis anterior tendon reduced, the ankle was likewise reducible, and the medial malleolar fragment could be returned to its normal position. Subsequent fixation of the fibula, medial malleolus, and Chaput fragment of the distal tibia were performed in a routine manner (Fig. 5). A syndesmotic screw was placed to augment the Chaput fragment fixation.

Postoperatively, the patient was kept non-weightbearing for 10 weeks owing to the syndesmotic injury, for which he was placed in a cast for the first 6 weeks to prevent equinus. At the 10-month postoperative visit, he could actively dorsiflex to approximately 5° past neutral, demonstrating a functional tibialis anterior tendon. His fixation was stable and the ankle mortise maintained (Fig. 6). He had returned to normal shoe wear by 4.5 months postoperatively and, ultimately, had returned to work in drywall installation by 6.5 months postoperatively in his normal work boots.



**Fig. 2.** Anteroposterior (A) and lateral (B) radiographs of the ankle taken at the outside facility after 2 attempts at closed reduction with the patient under conscious sedation.

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