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Closed Medial Malleolar Multifragment Fracture With a Posterior Tibialis Tendon Rupture: A Case Report and Review of the Literature

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ABSTRACT

Ankle fractures represent an exciting field of traumatology because of the wide variety of clinical presentations, injury mechanisms, and treatment options. Rupture of the posterior tibialis tendon (PTT) with ankle fracture can occur during trauma that involves pronation and external rotation of the foot or, less commonly, secondary to direct trauma to the ankle. This tendon injury is uncommon and probably misdiagnosed in many cases, because of the difficult clinical examination secondary to the pain and swelling. The identification and early treatment of PTT tears is essential for good functional outcomes to prevent the main mid- to long-term complication of disabling acquired flatfoot due to tendon failure. In the present report, we provide a review of the published data regarding ankle fractures associated with PTT rupture and describe our experience with a case of a multifragment medial malleolus fracture and complete rupture of the PTT diagnosed intraoperatively and surgically treated in a 34-year-old male, with 2.5 years of follow-up.

Complete rupture of the posterior tibialis tendon (PTT) in the background of an acute closed ankle fracture is uncommon and has been described in only a few case reports. When an isolated fracture of the medial malleolus is present, high-energy direct trauma is the most frequent causal mechanism involved. Traumatic rupture of the PTT can rarely be attributed to forced dorsiflexion with inversion or pronation and external rotation, in which the medial compartment of the ankle is involved. Because of the pain associated with the fracture, only a limited clinical examination will be possible. As such, rupture of the PTT is often identified only intraoperatively, and rupture of the PTT could frequently be misdiagnosed. Unawareness of the possible rupture of PTT in such types of trauma and consequently the lack of treatment can lead to long-term patient disability. The consequences of an unrecognized acute PTT rupture include progressive, painful pes planus deformities owing to the unopposed action of the peroneus brevis muscle and lack of support of the medial longitudinal arch. The PTT supports the medial longitudinal arch, contributing to the stabilization of the foot and supination. In selective cases of tendon failure, secondary operative intervention could be necessary to restore the proper anatomy and the correct arch stability.

Case Report

A healthy 34-year-old male was admitted to the emergency department with a painful, swollen left ankle. He reported a motorbike accident with involvement of the medial side of the ankle. On clinical examination, the left ankle appeared swollen, with a wide area of ecchymosis and pain, primarily over the medial aspect of the ankle. His active and passive movements were very limited and painful; no neurologic deficit was noted, and the posterior tibialis artery and dorsalis pedis were both palpable. Radiographs showed a multifragmented fracture of the medial malleolus, uncommon for the pathologic mechanism reported. Radiographic studies in the anteroposterior, lateral, and oblique projections and a computed tomography (CT) scan were performed to better identify the articular involvement (Fig. 1). Closed reduction with the patient under general anesthesia was attempted without success. A posteromedial curved incision was performed, and a multifragment fracture of the medial malleolus was identified. Complete rupture of the PTT, 1.5 cm proximal to the tip of the medial malleolus, was diagnosed intraoperatively. The tendon was healthy looking with no signs of degenerative tendinopathy (Fig. 2). The distal tendon stump was interposed between the fragments of the fracture, preventing

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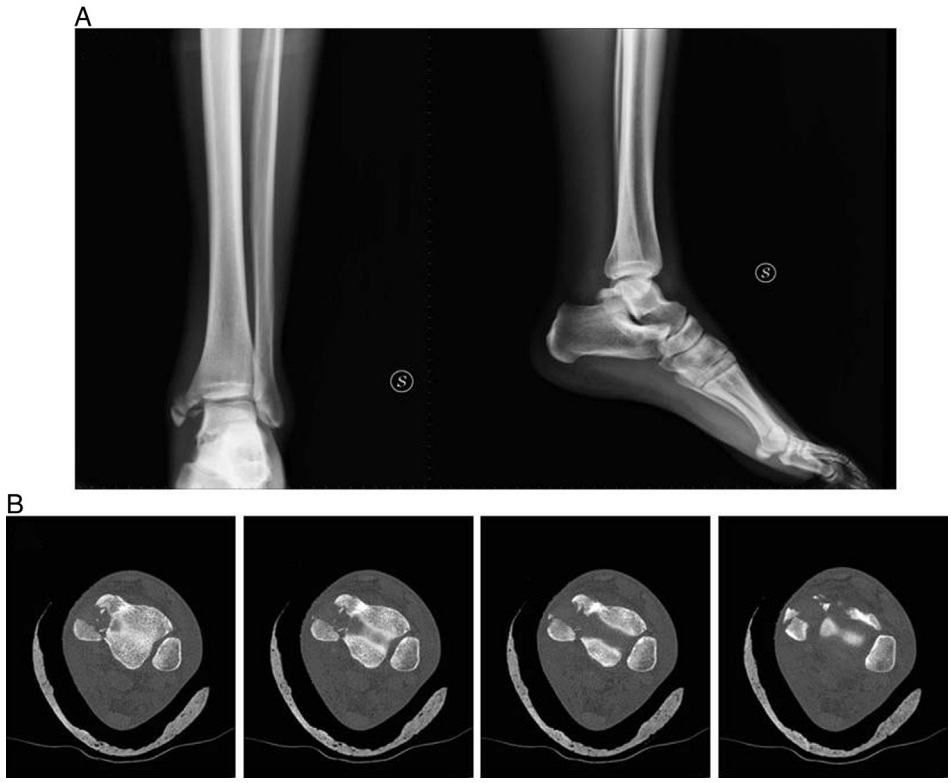

Fig. 1. (*A*) Preoperative radiographs and (*B*) computed tomography scans showing an isolated multifragmented tibial malleolar fracture.

Fig. 2. Intraoperative view of the posterior tibialis tendon lesion.

satisfactory closed reduction. Anatomic reduction and osteosynthesis of the malleolus with Kirschner wires and nonabsorbable suture wire using the Zuggurtung technique was performed. The PTT was repaired using a modified Kessler technique. The tendon was replaced within its natural course, and accurate reconstruction of the medial flexor retinaculum was performed. The deltoid ligament was exposed, examined, and successfully repaired with direct suture. The ankle and foot were then immobilized in a below-the-knee closed cast, with the ankle in slight subtalar joint inversion to minimize tension on the repaired PTT. No weightbearing was permitted for 3 weeks. At 3 weeks postoperatively, the first cast was removed, and the hindfoot was brought back to the neutral position and immobilized in a cast. Weightbearing was allowed at this stage to promote proprioception and gait re-education. Radiographic healing of the fracture was assessed at 6 weeks, and the second cast was removed to allow passive and active range of movement exercises and muscular reinforcement (Fig. 3). At 7 weeks postoperatively, the patient had normal range of motion of the ankle (minimal limitation of range of motion in dorsiflexion of 5°), and the subtalar joints had full recovery of the strength of anterior tibialis tendon and PTT (5 of 5) without any loss in his medial arch height. At 4 months postoperatively, the clinical and radiographic evaluation showed healing of the fracture, with no intolerance to the wires (which were maintained in site), maintenance of the medial arch length compared with the contralateral side, and a return to previous activities (Fig. 4). At 2.5 years postoperatively, baropodometric and podographic examinations of plantar weightbearing were performed and showed a bilateral normal rectus footprint. The only abnormal aspect seen at the baropodometric examination was a moderate overload on the left forefoot during the dynamic examination (70% versus 30% of the total body weight), likely because of occasional dorsal pain at the left ankle reported by the patient mainly after intense sports activity (Fig. 5). A normal