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Isolated Dislocation of the Posterior Tibial Tendon in an Amateur Snowboarder: A Case Report

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ABSTRACT

Isolated dislocation of the posterior tibial tendon is an uncommon pathologic entity that typically occurs in the setting of acute trauma. The diagnosis remains challenging and is often delayed second to the rarity of the injury and symptoms similar to that of medial ankle sprains and other routinely diagnosed injuries about the ankle. The factors that predispose this tendon to dislocation include a hypoplastic retromalleolar groove, flexor retinaculum insufficiency, chronic repetitive trauma, and a structural abnormality from a previous medial malleolar fracture, or a combination thereof. Dislocation has also been cited as a complication of multiple local steroid injections and tarsal tunnel release. The mechanism of injury appears to involve forced dorsiflexion and eversion of the ankle when the posterior tibial tendon is contracted. Most cases do not respond well to conservative treatment and will require surgery to restore function and eliminate symptoms. We report a case of posterior tibial tendon dislocation related to a snowboarding injury and offer our technique for surgical correction.

Many pathologic processes are associated with the posterior tibial tendon (PTT), including traumatic laceration, inflammatory and degenerative tendinopathy, seronegative arthropathy (1), symptomatic accessory navicular, and dislocation. Isolated dislocation is 1 of the least reported afflictions of the tendon, with the first case reported by Martius (2) in 1874, who sustained the injury after falling out of a balloon. From a biomechanical standpoint, injury to this tendon can result in rearfoot instability and flattening of the medial longitudinal arch, gradually leading to a painful flatfoot deformity if not addressed.

The diagnosis of PTT dislocation is often delayed because of a low index of clinical suspicion related to the rarity of the injury and a presentation similar to that of a medial ankle sprain. Compounding the diagnostic dilemma, a thorough physical examination can prove difficult in the acute traumatic setting. Clinically, edema and perimalleolar ecchymosis can be visualized. A palpable tendon might be present anterior to the medial malleolus that reduces with tibiotalar plantarflexion and redislocates with dorsiflexion. Plain radiographs will be of no benefit in making this diagnosis yet can assist in ruling out coinciding osseous pathology. Magnetic resonance imaging (MRI) is of more diagnostic value, allowing visualization of a displaced PTT, raised or torn flexor retinaculum, and/or hypoplastic retromalleolar groove.

The mechanism of injury appears to involve forced dorsiflexion and eversion of the ankle when the PTT is contracted (3). The factors increasing the risk of dislocation include a tear or avulsion of the flexor retinaculum, a shallow retromalleolar groove, elevation of the retinaculum from the tibia in a "retinacular-periosteal sleeve," lax retinaculum, chronic repetitive trauma, structural abnormality from a previous medial malleolar fracture, or a combination thereof (4–18). Dislocation has also been cited as a complication of multiple local steroid injections and tarsal tunnel release (19,20).

In the present report, we describe the case of traumatic dislocation of the PTT, without an associated fracture, in an amateur snowboarder. We attributed the dislocation to a traumatized, incompetent retinaculum and hypoplastic malleolar sulcus.

Case Report

A well-appearing 19-year-old male presented with a chief complaint of left ankle pain that had begun 7 months earlier when he had sustained a snowboarding injury, in which he landed from a jump and fell forward, twisting in his boot. He was unable to recall the exact mechanism. He had initially been treated for an ankle

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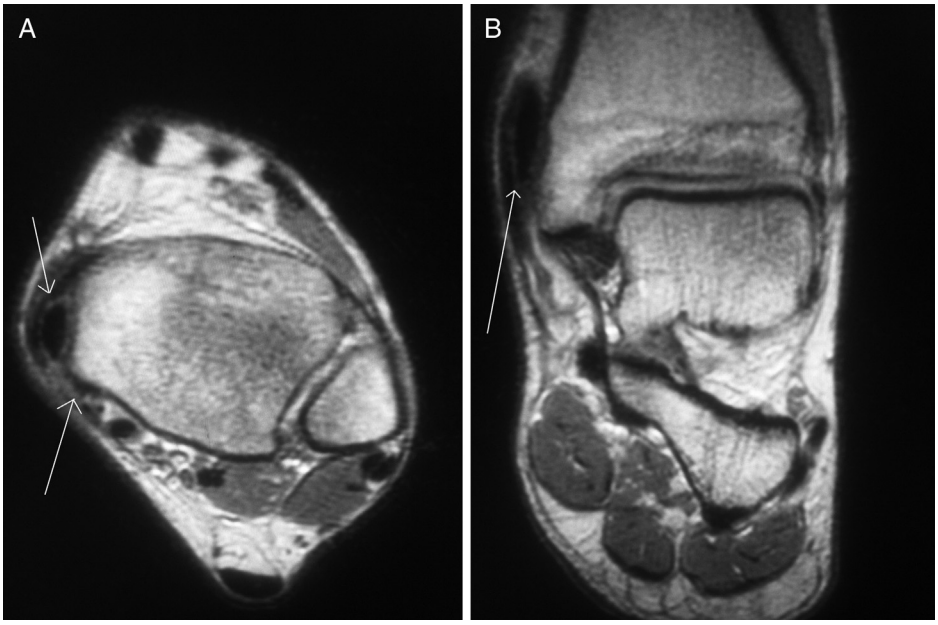

Fig. 1. (*A*) Magnetic resonance axial image demonstrating tendinopathy and dislocation of posterior tibial tendon. (*B*) Magnetic resonance coronal image demonstrating tendinopathy and dislocation of posterior tibial tendon.

sprain. The treatment had consisted of ice and a short duration of immobilization and non-weightbearing. Since then, he had experienced persistent swelling and dull, throbbing pain in the area, making it difficult to perform his daily activities and prohibiting him from snowboarding. The patient's medical history was unremarkable. The physical evaluation revealed moderate edema to the medial aspect of the left ankle. It was noted that the PTT was anteriorly dislocated, with a palpable void present in the retromalleolar fossa. The tendon was able to be relocated and dislocated with rearfoot manipulation. Attempted active inversion against resistance exhibited significant weakness, and difficulty was noted with a single leg heel rise, as well as imbalance. Plain radiographs were negative for osseous fracture, avulsion, or dislocation. MRI revealed thickening of the PTT with abnormal peritendinous fluid and dislocation of the tendon from the retromalleolar groove, which appeared flattened and hypoplastic (Fig. 1). The decision was made to proceed with surgical treatment.

Surgical Treatment and Postoperative Course

With the patient under general anesthesia, a 10-cm curvilinear incision was made in the retromalleolar region and deepened through the subcutaneous tissue to the level of the deep fascia and flexor retinaculum. It was apparent that the PTT was not in the normal anatomic position, instead lying anterior to the medial malleolus, but still within the retinaculum. The intact, yet attenuated, retinaculum was incised and elevated, exposing the dislocated PTT (Fig. 2). Tendinopathy was noted, and the diseased portion of the tendon was sharply excised. The tendon was elevated from its nonanatomic position, and an abrasion to the distal anterior tibia was identified. The retromalleolar groove was then evaluated and thought to have insufficient depth. Next, an osteoperiosteal flap was fashioned and raised posterior to the malleolus (Fig. 3). Using a rotary burr, the groove was deepened, contoured, and re-created for relocation of the PTT (Fig. 4). The lead surgeon recommended deepening the

Fig. 2. Intraoperative view of dislocated posterior tibial tendon lying anterior to medial malleolus.

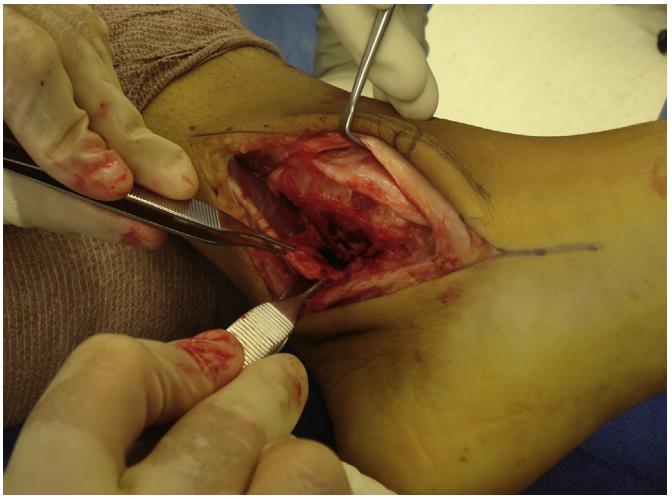

Fig. 3. Intraoperative view of osteoperiosteal flap.