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Conservative management of a PITFL fibular avulsion in the absence of syndesmotic instability: Case report and review of the literature

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Abstract
Ankle fractures are commonly associated with injuries to the ligamentous structures that maintain syndesmotic integrity. The posterior inferior tibiofibular ligament (PITFL) plays a critical role in stabilizing the distal tibiofibular joint. While avulsion fractures of the PITFL at its tibial insertion (Volkmann fragment) are well documented, avulsion at the fibular insertion is exceedingly rare, and there are no prior reports of such injuries being treated non-operatively.

We describe the case of a 36-year-old male who sustained a subtalar dislocation following a motorcycle accident. A CT scan revealed multiple non-displaced fractures, including the posterior process of the talus, sustentaculum tali, and calcaneocuboid joint, along with an avulsion fracture at the fibular insertion of the PITFL. Importantly, no syndesmotic instability was detected. The patient was treated conservatively with immobilization, followed by progressive mobilization and protected weight-bearing. At 12 months, he reported a VAS score of 4 and an AOFAS score of 82.

This case highlights a rare PITFL avulsion fracture at the fibular insertion, previously described in only one case managed surgically (Patel-Sharma fragment). Unlike prior reports, our patient demonstrated no syndesmotic instability and achieved favorable outcomes with conservative treatment.

To our knowledge, this represents the first reported case of a fibular-side PITFL avulsion fracture successfully managed without surgery. We suggest that in the absence of syndesmotic instability, such injuries may be effectively treated with a non-operative approach.

Keywords: Ankle fracture, fibular side avulsion, posterior inferior tibiofibular ligament (PITFL), conservative treatmen

Introduction
Ankle fractures are among the most common lower extremity injuries, accounting for nearly 10% of all fractures [1]. These injuries are frequently associated with damage to the ligamentous complex responsible for maintaining the integrity of the mortise between the tibia and fibula. Among these structures, the posterior inferior tibiofibular ligament (PITFL) plays the most significant role in syndesmotic stability, contributing up to 40%, [2] and also serves as the primary restraint against posterior talar translation [3].

Injuries to the PITFL may occur either through ligament rupture or via avulsion at its tibial insertion (Volkmann fracture) [4] or fibular insertion [5] (Patel-Sharma fragment) [6]. Failure to accurately identify and appropriately treat isolated or combined syndesmotic injuries may lead to chronic ankle instability, persistent pain, and post-traumatic osteoarthritis [7].

To our knowledge, this is the first reported case in which a PITFL avulsion associated has been managed conservatively.

Case Report
We present the case of a 36-year-old male patient who was initially treated at another facility following a motorcycle accident. He sustained a subtalar dislocation of the foot, which was reduced and immobilized with a splint (no imaging from the initial treatment is available).

The patient was referred to our center with a below-knee immobilization and a previously reduced dislocation. A CT scan performed at our institution revealed a non-displaced fracture of the posterior process of the talus, the sustentaculum tali, and the articular surface of the calcaneus at the calcaneocuboid joint (figure 1). Additionally, a non-displaced avulsion fracture of the PITFL insertion on the fibula was observed (figure 2 B.C). No evidence of instability was noted in the distal tibiofibula r syndesmosis (Figure 2 A). Based on these findings, a conservative treatment approach was adopted, with radiographic follow-

up conducted at 1, 2, 6, and 12 months post-injury.
The ankle was immobilized for 4 weeks, after which active and passive mobilization was initiated. Progressive protected weight-bearing with a Walker boot was permitted until week 8.
At 3 months post-injury, the patient was cleared to resume sporting activities and returned to work during the same month.
At the 12-month follow-up, the patient reported a Visual Analog Scale (VAS) pain score of 4 and achieved a score of 82 on the American Orthopaedic Foot & Ankle Society (AOFAS) scale.
The weight-bearing ankle radiograph obtained at the one-year follow-up demonstrates a healed fibular malleolar fracture, without evidence of syndesmotic instability (figure 3.B), and a plantigrade foot with no degenerative changes in the subtalar joint (figure 3 A).

Discussion

Subtalar dislocation is a high-energy injury that is frequently associated with fractures involving the processes of the talus and calcaneus, as well as the medial and lateral malleoli of the ankle [8-11]. Notably, the coexistence of an ankle fracture increases the complexity of acute management, may hinder successful reduction, and is associated with poorer long-term functional outcomes and a higher risk of post-traumatic osteoarthritis [8, 10, 11]
In their 2024 article, Yao *et al* [5]. Described various injuries affecting the stabilizing ligaments of the distal tibiofibular syndesmosis, particularly the anterior inferior tibiofibular ligament (AITFL) and the PITFL. For the first time, they reported the possibility of an avulsion fracture involving the fibular surface at the insertion of the PITFL [5].
Subsequently, Patel *et al* [6] referred to this type of injury involving the posteromedial tubercle of the fibula as the Patel-Sharma fragment. In their case, the lesion was associated with syndesmotic instability and anterior subluxation of the fibula. They performed open reduction and internal fixation of the fragment using a one-third tubular plate, supplemented with two trans-syndesmotic screws to stabilize the syndesmosis [6].
In contrast, our patient presented with a non-displaced fracture of the fibular posteromedial tubercle and no evidence of syndesmotic instability. Therefore, a conservative treatment approach was chosen, which, in our view, resulted in an excellent functional outcome.

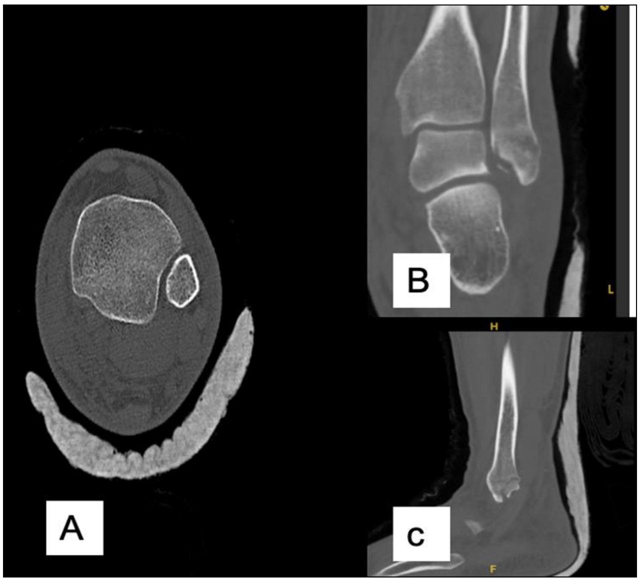

Fig 1: CT images of the hindfoot.

a) Non-displaced fracture of the sustentaculum tali and the articular surface of the calcaneus at the calcaneocuboid joint (red star).
b) Fracture of the posterior process of the talus (red arrow).

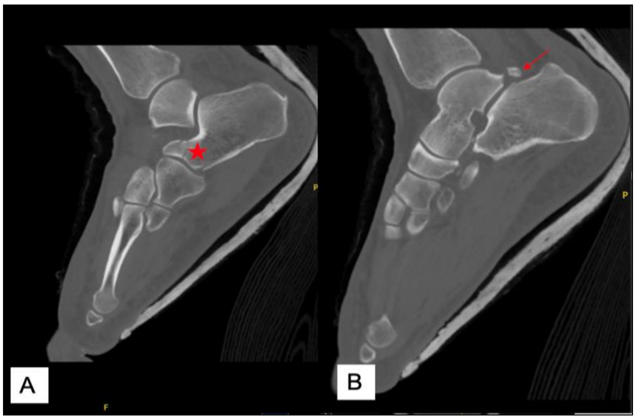

Fig 2: Ankle CT images.

a) No evidence of syndesmotic instability.
b) B and C. Non-displaced PITFL avulsion fracture involving the fibula.

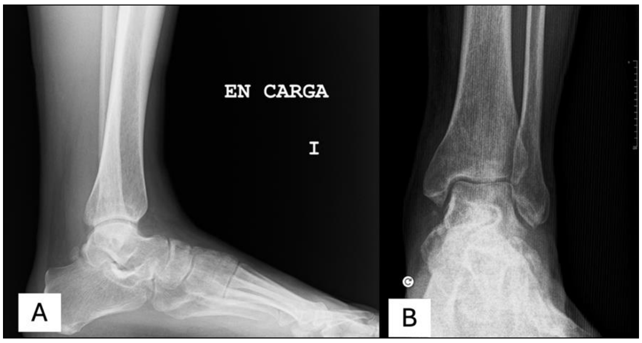

Fig 3: Weight-bearing ankle X-rays at one-year follow-up.

a) Lateral view showing a healed fibular fracture, plantigrade foot, and no degenerative changes in the subtalar joint.
b) Anteroposterior view showing absence of syndesmotic instability.

Conclusion

We present the second documented case in the literature of a PITFL avulsion fracture involving the fibula, and the first to be managed conservatively.

The morphological presentation of syndesmotic injuries can vary significantly between ankle fractures and therefore requires individualized assessment in each case.

We believe that this type of lesion, in the absence of syndesmotic instability, can be effectively managed with a conservative treatment approach.

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Conflicto of interest

Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement.

Informed Consent

Written consent was obtained for the publication of the data presented in this work.

Ethical Approval

The authors declare that the present case report complies with the ethical standards of the institutional and national research committees and with the principles outlined in the Declaration of Helsinki. Formal ethical approval was not required for this single-patient case report as no experimental procedures were performed, and all patient data were anonymized.

Informed Consent

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images. A copy of the signed consent form is available for review by the editorial office upon request.

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