

Analysis of PITFL Injuries in Unstable Ankle Fractures

Stephen J. Warner, MD, PhD; Matthew R. Garner, MD; Patrick C. Schottel, MD; Richard M. Hinds, MD; Dean G. Lorich, MD; Hospital for Special Surgery, New York, New York, USA

Background/Purpose: Reduction and stabilization of the syndesmosis in unstable ankle fractures is important for ankle mortise congruity and restoration of normal tibiotalar contact forces. Of the syndesmotic ligaments, the posterior inferior tibiofibular ligament (PITFL) provides the most strength for maintaining syndesmotic stability, and previous work has demonstrated the significance of restoring PITFL function when it remains intact to a posterior malleolus fracture. However, in cases where the PITFL is disrupted in the absence of a posterior malleolus fracture, little is known regarding the nature of this injury. The goal of this study is to describe the injury pattern to the PITFL based on MRI and intraoperative observation.

Methods: A prospective database of all operatively treated ankle fractures (OTA 44) by a single surgeon from 2010 through 2013 was used to identify patients who underwent operative fixation of supination–external rotation (SER) types III and IV ankle fractures according to the Lauge-Hansen classification. All patients included in the study had preoperative orthogonal ankle radiographs and MRI. Using a combination of preoperative imaging and intraoperative findings, we analyzed the nature of injuries to the PITFL.

Results: From our prospective database, 213 SER III and IV operatively treated ankle fractures (OTA 44) were identified. Of these, 185 had complete imaging and were included in the study. Analysis of the preoperative imaging and operative reports revealed 34% had posterior malleolus fractures. From the remaining 122 ankle fractures, the PITFL was delaminated from the posterior malleolus in the 97% of cases (Figure 1). A smaller proportion had intrasubstance ruptures (3%) to the PITFL.

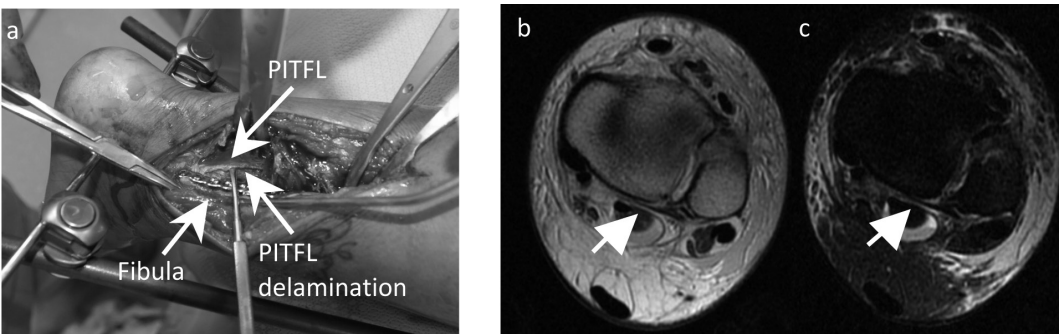


Figure 1. Intraoperative image (a) and axial proton density (b) and short-tau inversion recovery (STIR) (c) magnetic resonance images of PITFL delaminations from the posterior malleolus.

Conclusions: Accurate and stable syndesmotic reduction is a significant component of restoring the ankle mortise after unstable ankle fractures. In our large cohort of unstable

- The FDA has not cleared this drug and/or medical device for the use described in this presentation (i.e., the drug or medical device is being discussed for an “off label” use). For full information, refer to page 600.

ankle fractures without posterior malleolus fractures, we found that the majority of PITFL injuries occur as a delamination off the posterior malleolus. This predictable injury pattern of the PITFL may be used to guide new methods for stabilizing the syndesmosis in these patients.