

CT Assessment of Peroneal Tendon Displacement and Posteromedial Structure Entrapment in Pilon Fractures

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Background/Purpose: Pilon fractures are often associated with significant damage to the articular surface of the tibial plafond and surrounding soft tissue. The objective of this study was to analyze a cohort of patients that sustained pilon fractures and determine (1) the prevalence of peroneal tendon displacement and posteromedial soft-tissue interposition accompanying these high-energy injuries, (2) association of peroneal tendon displacement and posteromedial structure entrapment with OTA / AO fracture classification and concomitant fibular fractures, and (3) the rate of missed diagnosis of peroneal tendon displacement and posteromedial structure entrapment based on interpretation of CT. We hypothesized that the prevalence of peroneal tendon displacement and posteromedial soft-tissue entrapment increases with fracture severity and the presence of a concomitant fibular fracture, and that the diagnosis was frequently missed.

Methods: This was a retrospective radiographic review of pilon fractures treated between July 2008 and November 2014. Radiographs and CT images of 200 pilon fractures before definitive fixation were available for review. Fractures were classified as OTA / AO types 43-A, B, or C and concomitant fibula fractures were identified. Bone and soft-tissue windows of axial and reconstructed CT images were used to determine (1) peroneal tendon subluxation/dislocation or avulsion of the superior peroneal retinaculum, and (2) posteromedial soft-tissue interposition within the fracture site. Medical charts were reviewed for documentation of either injury in final radiology reports.

Results: Peroneal tendon displacement was present in 22/200 (11%) fractures reviewed. Posteromedial structure entrapment was present in 38/200 (19%) fractures reviewed, with the tibialis posterior tendon interposed most frequently in 33/38 (87%), and often even after provisional external fixation. The prevalence of peroneal tendon displacement and posteromedial soft-tissue interposition was highest in complete articular fractures (OTA / AO type 43-C) at 15% and 25%, respectively. In complete articular fractures with an ipsilateral fibular fracture, peroneal tendon displacement occurred in 11%. In complete articular fractures without an ipsilateral fibular fracture, peroneal tendon displacement occurred in 35%. Only 11/22 (50%) cases of peroneal tendon displacement and 19/38 (50%) cases of posteromedial soft-tissue interposition were documented in final radiology reports.

Conclusion: This study further demonstrates that CT imaging of pilon fractures can be instrumental in identifying injury to surrounding soft-tissue structures. Peroneal tendon displacement and posteromedial structure entrapment is most prevalent in severe injuries to the tibial plafond classified as OTA / AO type 43-C fractures. Our study suggests that when an ipsilateral fibula fracture is present, peroneal tendon displacement is less common. The presence of these injuries are commonly overlooked, which may result in unnecessary

morbidity, such as difficult or failed reduction and need for additional surgery. Radiologists and orthopaedic surgeons should be mindful of these concomitant injuries when evaluating and treating pilon fractures.

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.