

Rate of Syndesmotic Instability Following Anatomic Posterior Malleolar Fracture Open Reduction and Internal Fixation

Matthew A. Miller, MD; Clay Spitler, MD; Matt L. Graves, MD; William Replogle, PhD; Josie M. Hydrick, BS; LaRita C. Jones, PhD; **Patrick F. Bergin, MD**
University of Mississippi Medical Center, Jackson, Mississippi, USA

Purpose: This study sought to define the rate of distal tibiofibular syndesmotic instability following the anatomic reduction of the posterior malleolus when direct posterior stabilization of a trimalleolar ankle fracture (AO/OTA 44 B3 or C type fractures) was chosen. Conversely, we wanted to evaluate the rate of syndesmotic and posterior instability when a supine position and initially conservative management of the posterior elements was chosen.

Methods: We identified all adult posterior malleolar ankle fractures treated at our Level I trauma center from January 2012 to December 2015. Exclusion criteria included pilon fractures, trimalleolar fractures with Chaput fragments, and neurologic injury. Demographic information, fracture classification, initial operative position, medial clear space, and posterior malleolar fragment size were recorded for each fracture. We assessed the use and type of syndesmotic and posterior malleolar fixation used in these injuries.

Results: Data on 198 patients were analyzed. 151 patients (76.3%) were initially positioned supine, 41 of whom (27.2%) had syndesmotic instability requiring operative stabilization. Of the 110 supine patients who did not require syndesmotic stabilization, 32 (29.1%) required posterior malleolar stabilization for posterior instability. 47 patients (23.7%) were initially positioned prone. Following anatomic reduction and internal fixation of the posterior malleolus, syndesmotic stability was restored in 46 of 47 patients (97.9%). This 2.1% rate of instability is in stark contrast to the 13-fold higher syndesmotic instability rate seen in the supine group ($P < 0.001$).

Conclusion: Using traditional preoperative estimates of posterior stability may be inadequate. When patients were positioned supine based on small posterior malleolar fragment size, stabilization of the posterior fragment or syndesmotic fixation was required nearly 28% of the time. When initial posterior malleolar fixation was chosen, syndesmotic fixation was extremely rare. Findings suggest that it may be beneficial to anatomically reduce and stabilize the posterior malleolus at a higher rate to allow for adequate ankle stability, more reliable restoration of syndesmotic anatomy, and prevent surgical injury to the distal tibiofibular joint.