

Simultaneous Posterolateral and Posteromedial Approaches for Posterior Pilon Fractures: A Safe Technique for Effective Reduction and Fixation

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Purpose: The posterior pilon fracture variant involves an injury to the entire posterior tibial plafond. This injury pattern is unique compared to a typical posterior malleolar fracture because the coronal plane fracture line extends medially to involve the posterior colliculus of the medial malleolus. The purpose of this study was to determine short-term outcomes in a series of patients treated with combined posteromedial and posterolateral approaches. We hypothesized that this technique would have a low rate of wound complications, and result in accurate articular reductions. Additionally, we sought to understand the role of mechanism of injury on fracture characteristics, and hypothesized that patients who sustained fractures as a result of a high-energy mechanism would have a higher rate of posteromedial impaction and syndesmosis injury.

Methods: A retrospective review was designed using the trauma database at a single Level I academic trauma center. Patients treated operatively from 2000 to 2019 for a posterior pilon fracture using dual posteromedial and posterolateral approaches were identified. Outcome measures were identified, including: (1) rate of wound complications and the accuracy of the articular reduction, and (2) fracture characteristics including the incidence of articular impaction, comminution interfering with reduction, syndesmosis injury, and the type of fibula fracture. To determine the association between mechanism of injury and fracture characteristics, patients were grouped into low (ground level event) or high (fall from height or motorized vehicle) energy cohorts. The presence of a syndesmosis injury requiring fixation, articular impaction, comminution preventing a reduction, and fibular fracture patterns were compared between these groups.

Results: 33 patients with 3-month minimum follow-up were included in the study. The rate of wound problems was low (6%), and 94% of patients had an articular reduction with <1 mm of step or gap. There were high rates of articular comminution (83%) and posteromedial articular impaction (63%), and a 17% rate of syndesmosis injury requiring repair. There were 24 patients with low-energy mechanisms and 9 with high-energy mechanisms. There were no differences in the rates of syndesmosis injury requiring fixation, articular impaction, reduction-blocking comminution, or type of fibula fracture between these 2 groups.

Conclusion: Surgical fixation using simultaneous, combined posterolateral and posteromedial approaches for posterior pilon fractures had a low rate of wound complications and was an effective strategy for obtaining an accurate reduction. The rate of syndesmotic instability requiring fixation was lower than previous work reporting on fixation using a single approach. This may be a useful technique for surgeons who treat these injuries. Careful assessment of the preoperative imaging is required in patients with posterior pilon fracture, even in those with low-energy mechanisms.