

Avoiding the Osteotomy: Mapping of Posterior Talar Dome Access Through Posteromedial Versus Posterolateral Approaches: A Cadaveric Study

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Purpose: Posterior talar body fractures (AO/OTA 81.1.B/C) are rare injuries that can present an approach dilemma as surgical access to the talar dome has not been well described in the fracture setting. In treating these injuries, a preoperative decision must be made between a posterior, soft-tissue-based approach or a periarticular osteotomy, which is associated with morbidity and complications. This study aims to evaluate the accessible area of the talar dome via 2 standard posterior approaches (posteromedial [PM] and posterolateral [PL]) with and without distraction.

Methods: 12 through-knee male cadaveric legs (6 matched-pairs) were included. A standard PM or PL approach was performed using a randomized crossover design. 5 mm of distraction through the tibiotalar joint, confirmed fluoroscopically, was applied to the specimens with an external fixator device with the foot held in a neutral position. The accessible area of the talar dome was outlined by drilling with a 0.9-mm Kirschner wire with and without distraction. The tali specimens were explanted and imaged using a microCT scanner and PostView2.4 was used to calculate surface area on 3-dimensional reconstructions.

Results: The total surface area of the tali averaged 16.94 ± 2.47 cm² and there was no statistically significant difference between paired specimens ($P = 0.42$). The PM approach allowed access to 17% of the talar dome surface without distraction and 29.3% of the talar dome with distraction ($P < 0.001$). The PL approach provided access to 7.4% and 17.1% of the talar dome surface area with and without distraction ($P < 0.001$). The PM approach allowed greater access to the talar dome than did the PL approach both with and without distraction ($P < 0.05$).

Conclusion: These results provide a roadmap that can help determine talar dome access for treatment of talar body fractures. We found no advantage to a PL approach over a PM approach to access these challenging fractures. Using an external fixator for distraction can be used to improve talar dome visualization by at least 15%.