Open Reduction Internal Fixation of Posterior Malleolus Fractures via a Posteromedial Approach

Robert Zbeda, MD, Lon Weiner, MD, Stuart Katchis, MD, Steven Friedel, MD

Category: Ankle, Trauma

Keywords: Posterior Malleolus, Posteromedial Approach, Trimalleolar Fracture

Introduction/Purpose: Ankle fractures with a posterior malleolus component are complex injuries to manage. Due to the heterogeneous morphology of these fractures and lack of high-quality evidence, methods of surgical fixation are controversial and highly variable. The most commonly used surgical methods include indirect reduction via a percutaneous anterior approach or direct reduction via a posterolateral approach. For large posterior malleolus fractures with medial extension, direct reduction via a posteromedial approach is an alternative surgical option. The purpose of this study was to report on a large series of posterior malleolus fractures treated via a novel posteromedial approach. The study hypothesized that fixation of large posterior malleolus fractures with medial extension via a posteromedial approach results in anatomic reduction and stable plate fixation.

Methods: From 2008 to 2015, 23 of 244 (9.4%) consecutive operative ankle fractures were identified as posterior malleolus fractures treated using a posteromedial approach (Figure 1). All patients had pre-operative computed tomography scans to confirm the presence of a posterior malleolus fracture with medial extension (Figure 2-4). A posteromedial incision was made and fracture was reduced with the saphenous vein retracted anteriorly and the posterior tibial tendon retracted posteriorly. Patient charts were retrospectively reviewed for demographics, injury history, surgical details, follow-up time, and any post-operative complications. Post-operative radiographs were reviewed to ensure that anatomic reduction and stable fixation was maintained (Figure 5).

Results: 73.9% (17/23) of the patients were female and the average age at the time of surgery was 54.6 years (range, 26-86 years). There were no open fractures, but 8/23 (34.7%) patients required external fixation prior to open reduction internal fixation (ORIF) for soft tissue management. The average follow-up time was 11.0 months (range, 0.3 to 41.4 months). All patients healed completely on a clinical and radiographic basis. Anatomic reduction and stable plate fixation was obtained intra-operatively in all patients and maintained at maximal follow-up. Eight (34.7%) patients underwent removal of hardware. There was a 13.0% (3/23) post-operative complication rate: 1 patient had cellulitis, 1 patient had osteomyelitis involving the fibula, and 1 patient had symptomatic heterotopic ossification. All complications resolved with appropriate management.

Conclusion: ORIF of posterior malleolus fractures via a posteromedial approach achieved anatomic reduction, stable plate fixation, and complete healing in all patients. Posteromedial approach enables direct visualization and anatomic reduction of large posterior malleolus fractures. Fixation of the posteromedial tibial plafond is important because, unlike the posterolateral aspect, there are no ligamentous insertions that can provisionally reduce the fracture fragment by ligamentotaxis. In concurrence with previous literature, our study demonstrates that posteromedial approach is a reasonable alternative to other more commonly used methods for treating these fractures.

Foot & Ankle Orthopaedics, 2(3) DOI: 10.1177/2473011417S000427 ©The Author(s) 2017

This open-access article is published and distributed under the Creative Commons Attribution-NonCommercial 3.0 License [http://www.creativecommons.org/licenses/by-nc/3.0/] which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages [https://us.sagepub.com/en-us/nam/open-access-at-sage].