

Full Weight-Bearing after Percutaneous Fixation of Posterior Malleolar Fractures Associated with Spiral Distal-Third Tibial Shaft Fractures is Safe: A Comparative Cohort Study

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INTRODUCTION:

The purpose of this study is to determine if radiographic or clinical outcomes differ for immediate versus delayed weight-bearing in patients who underwent fixation of a tibial shaft fracture with a concomitant posterior malleolar fracture.

METHODS:

After IRB approval we performed a retrospective cohort study at our Level 1 trauma center over a two-year period (2020-2022). All patients with an surgically treated tibial shaft fracture were reviewed. For inclusion in the study, patients had intramedullary treatment of the tibial shaft fracture and independent screw fixation of the posterior malleolus. All patients with a tibial shaft fracture with concomitant posterior malleolar fractures were included. Pathologic fractures, pilon fractures, and patients under the age of 18 were excluded. Demographic data was extracted from the medical record. All patients were treated by a fellowship-trained orthopaedic traumatologist. All patients had stabilization of the posterior malleolar fragment prior to intramedullary nailing (19). With regard to postoperative weight-bearing, three surgeons allowed immediate weight-bearing in a CAM walking boot while one surgeon delayed weight-bearing for 8 weeks.

Patients were then stratified into one of two groups: immediate weight-bearing (WBAT) or delayed weight-bearing (NWB) (8 weeks). The main outcome variable was the displacement of the posterior malleolar fragment at final follow up. Secondary outcome variables included healing of the tibial shaft component, infection, or reoperation for any reason. All patients were followed to bony union.

Data analysis was performed. The means of each variable were compared using analysis of variance, and significance was set at a p -value of less than 0.05. A chi-squared test was used to evaluate categorical data.

RESULTS:

We identified 268 tibial shaft fractures with 159 fractures (59%) located in the distal third. Of the 159 distal third fractures, 55 (35%) of them were spiral, and 104 (65%) were not. Of the 55 spiral fractures, 44 (80%) of them had posterior malleolar involvement and there were no posterior malleolar fractures in the non-spiral group ($p < 0.001$). There were 22 patients in the NWB group and 22 patients in the WBAT group.

There were 10 males in the NWB (45%) group and 11 in the WBAT group (50%) ($p = 0.76$). The average age in the NWB was 43 while the average age in the WBAT group was 53 ($p = 0.11$).

All the tibial shaft fractures went on to healing. Additionally, all posterior malleolar fractures healed. There was no displacement of the posterior malleolar fracture in either group. There were 2 patients (9%) in the NWB group who underwent an additional procedure to remove symptomatic interlocking screws compared to one patient (4.5%) in the WBAT group ($p = 0.55$). There were no infections or additional procedures performed.

DISCUSSION AND CONCLUSION:

We have demonstrated that full weight-bearing for patients with a tibial shaft fracture and concomitant posterior malleolar fracture is safe. Based on the results of our study, the surgeon that restricted weight-bearing for this injury constellation now allows full, immediate, unrestricted weight-bearing.