

**Factors Affecting Outcomes of Hindfoot Fusion Nails for Acute Injury:
A Multicenter Study**

*Eugene Kim, MD, MBA; Paul Tornetta III, MD, PhD, FIOTA;
Orthopaedic Trauma Research Consortium Group*

Purpose: We sought to review a large cohort of patients treated with hindfoot fusion nails for acute ankle and pilon fractures to evaluate the effect of joint preparation and patient factors on outcomes and complications.

Methods: We performed a retrospective study of 189 patients (88 M, 101 F) median age 68 years treated for acute ankle (134) or pilon (55; 11A, 14B, 30C) fractures at 15 centers. We evaluated the influence of joint preparation as well as patient and injury risk factors on infectious and fracture complications, weightbearing, and return to preoperative ambulatory status.

Results: 85 patients (45%) had open fractures and 69 (37%) had diabetes (33 IDDM [insulin-dependent diabetes mellitus]; 36 NIDDM [non-IDDM], 54 neuropathic). 37 patients (20%) had debridement of cartilage (joint preparation) at the time of surgery. For the entire cohort, 93 (49%) were made weightbearing as tolerated (WBAT) after surgery; the average time to mobilize was 19 days (range, 0-219) and to full weightbearing was 57 days (0-537). Only 60% of patients returned to their preinjury weightbearing status and 40% were independent without assistive devices; 11% were non-ambulatory at last follow-up. Return to pre-injury weightbearing was not affected by joint preparation ($P = 0.27$). Joint preparation led to higher articular fusion rates (94% vs 30%; $P = 0.001$), fewer hardware removals (24% vs 44%, $P = 0.037$), but a higher fracture nonunion rate (24% vs 7%, $P = 0.005$) than no preparation. A total of 47 patients (25%) had infectious complications, 60 (32%) had a fracture-related complication, and 64 (34%) had additional procedures. Open fractures led to higher rates of fracture nonunion (16% vs 6%, $P = 0.039$) but no differences in superficial or deep infection. IDDM was associated with higher rates of superficial infection (35% vs 13%, $P = 0.003$), deep infection (29% vs 14%, $P = 0.039$), superficial wound breakdown (34% vs 14%, $P = 0.009$), deep wound breakdown (27% vs 8%, $P = 0.003$), and amputation (17% vs 5%, $P = 0.054$).

Conclusion: Hindfoot fusion nails for acute ankle and pilon injuries had high complication rates resulting in 63 patients (33%) having additional procedures. More complications occurred in IDDM patients. While 89% regained ambulation, only 60% returned to preoperative status.