Is Hindfoot Fusion an Effective Salvage for Failed Fractures About the Ankle?

Jack C. Adams, BA*; Luke A. Lopas, MD; Yohan Jang, DO; Mark Yakavonis, MD; Gregory J. Della Rocca, MD, PhD, MBA; Mubinah Khaleel, DO; Brett D. Crist, MD; Kyle Schweser, MD; Hassan R. Mir, MD, MBA, FIOTA; Mir Ibrahim Sajid, MD; Kenneth A. Egol, MD*

Purpose: This study investigates the efficacy of hindfoot fusion nails as a salvage procedure for failed surgically treated ankle or pilon fractures.

Methods: A multicenter retrospective chart review for patients over 18 years of age who underwent hindfoot arthrodesis with a retrograde intramedullary nail as treatment for failed initial fixation of ankle or pilon fractures was performed. Failure was defined as nonunion, fracture-related infection (FRI), neuropathic degeneration, or posttraumatic osteoarthritis (PTOA). Data anonymization protocols were followed post-study.

Results: 50 ankles underwent hindfoot nailing with or without articular surface preparation as a salvage procedure for failed fixation of ankle or pilon fractures. The average age at initial injury was 52.7 ± 12.1 years, increasing to 54.3 ± 13.8 years by the time of revision surgery. The majority of patients were male (63.9%), with a mean body mass index of 32.4 ± 9. The average ISS of the patients' initial injuries was 9.34 ± 7.2 with 65% resultant of high-energy injuries, 37.1% open fractures, and concomitant ipsilateral injuries in 37.1% of cases. The cohort had an average American Society of Anesthesiologists score of 2.74 ± 0.7. 16.7% of patients were diabetic and experiencing neuropathy. 8.3% of the cohort had peripheral vascular disease. The average time from primary fixation to failure was 519 ± 1142.6 days, and average time from failure to revision 50.87 ± 56.0 days. The leading indications for revision surgery were FRI (42.9%), nonunion (45.7%), and PTOA (31.4%), and the majority of patients had a combination of reasons. There were an average of 1.11 ± 1.2 hospital readmissions following revision. Mortality was minimal, with no 30-day deaths and one 1-year mortality. Outcomes showed a 94.4% fusion rate. 73.5% improved their pre-surgery ambulatory status, while 26.5% saw a decrease from independence to requiring a cane. Complications included 21.2% experiencing a deep infection and 25.0% requiring implant removal. 2.8% underwent revision fixation. Two patients opted for below-knee amputation following sustained FRI.

Conclusion: Hindfoot fusion nails are effective as a salvage procedure in cases of failed ankle or pilon fracture fixations.