

Closed Reduction and Percutaneous Fixation versus Open Reduction and Internal Fixation of Intra- Articular Calcaneal Fractures

*Nicholas Bolz, MD; Aws Hammad, MD; Robert E. Meehan, MD
Detroit Medical Center, Detroit, MI, United States*

Purpose: Both percutaneous fixation and open reduction and internal fixation are used for the surgical treatment of intra-articular calcaneal fractures. However, there is no general consensus as to which method is preferred. There has been an association with increased risk of wound complications when treating these fractures with open techniques, such as wound dehiscence and deep infections. Percutaneous techniques allow the surgeon to restore calcaneal anatomy in a minimally invasive fashion, therefore avoiding wound complications especially in the context of extensive soft-tissue damage. Our hypothesis is that the group treated by percutaneous fixation will have similar outcomes in addition to decreased incidence of wound complications.

Methods: We generated a list of patients who were treated surgically for a calcaneus fracture at a Level-I trauma center by the senior author from July 2003 through March 2013. Patients were then divided into 2 groups based on surgical treatment received: (1) group 1 consists of patients treated by closed reduction and percutaneous pinning (CRPP), and (2) group 2 consists of patients treated by open reduction and internal fixation (ORIF). Data analysis for each group included demographics, fracture classification, open versus closed fractures, complications, and reoperations. We included all adult patients treated over the course of 10 years (2003-2013) by CRPP or ORIF at a single Level-I trauma center by a single orthopaedic surgeon (fellowship trained in foot and ankle) with at least 1 month follow-up. We excluded pediatric patients. Patients with less than 1 month of follow-up were also excluded.

Results: There were a total of 57 patients who met the inclusion criteria. 32 patients underwent CRPP (average follow-up 22.17 months) and 25 patients underwent ORIF (average follow-up 17.5 months). Seven patients from the ORIF group developed a postoperative wound complication (all 7 required a reoperation for an irrigation and debridement) compared to only 1 patient from the CRPP group (who also required an irrigation and debridement). This difference was statistically significant ($P = 0.0073$). Eight patients in the CRPP group developed symptomatic subtalar arthritis requiring intervention (cortisone injection or subtalar fusion) compared to 5 patients in the ORIF group (P value = 0.655).

Conclusion: Both procedures may be considered for the surgical treatment of intra-articular calcaneal fractures; however, it appears that closed reduction and percutaneous fixation leads to less postoperative wound complications while also having a similar incidence of posttraumatic subtalar joint arthritis.