

Screws-Only Primary Subtalar Arthrodesis for Calcaneus Fractures

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Purpose: The initial management of displaced intra-articular calcaneus fractures (DIACFs) is an area of controversy in orthopaedics. The results of open reduction and internal fixation (ORIF) have been disappointing, especially when considering the Workers' Compensation (WC) population. Alternatively, ORIF with primary subtalar arthrodesis (PSTA) has gained increasing interest as an attempt to address the pain component in addition to the deformity of the injury. The purpose of this study is to review patient-centered and radiographic outcomes of ORIF plus PSTA using screws alone through a sinus tarsi approach.

Methods: A retrospective study of all patients from 2013 to 2019 who underwent ORIF + PSTA for a calcaneus fracture was conducted. The surgical technique consisted of reducing and lagging the posterior facet of the calcaneus to the talus with screws after removing the cartilage through a sinus tarsi approach. The extra-articular portion of the calcaneus was reduced and fixed using large headless screws into the talus and longitudinally into the anterior process of the calcaneus. Allograft was placed in the bone void and in the prepared sinus tarsi (for extra-articular fusion). No plates were applied. Delayed surgeries past 8 weeks were excluded. Demographic data, injury, and job information, along with relevant medical and radiographic data, were collected. In line with similar studies, results were delineated by WC status. Plain radiographs were used to assess healing based on 3 zones of fusion: posterior facet on lateral and axial views and sinus tarsi on lateral.

Results: 48 fractured calcanei underwent PSTA, 12 received WC, including 11 laborers. The groups did not differ significantly on demographic or injury characteristics. Among the 12 WC patients, 9 (75%) returned to work. Of the 36 not receiving WC, 11 were laborers (30.6%) and 21 returned to work (58.3%) ($P = 0.0003$). Median time to weight-bearing was 60 days (range, 26-151) and median time to final follow-up was 194 days (range, 26-1007). Patients on WC were more likely to have had an abnormal preoperative Bohler's angle ($P = 0.047$) but the groups were not significantly divided on Bohler or Gissane angles postoperatively. Three calcaneus fractures were documented as a Sanders II, 22 as Sanders III, and 23 as Sanders IV. 85.4% ($N = 41$) achieved ≥ 2 zones of fusion on radiographs by final follow-up and 95.8% ($N = 46$) had at least 1. Four patients had a complication and 3 required a return to the operating room, 2 due to infection and hardware removal and 1 for an equinus contracture.

Conclusion: DIACFs are complex traumatic injuries with advancing focus on patient-centered outcomes. Screws-only primary subtalar arthrodesis through a sinus tarsi approach shows promising results with high rates of return to work and fusion, even in the WC population.