

## **Minimal invasive reduction and ilizarov technique for the management of displaced عنوان البحث intraarticular calcaneal fractures**

### **الملخص الانجليزي:**

Poor skin status or comminution accompanying intraarticular calcaneal injury could be an obstacle to the classic open reduction and internal fixation. Ilizarov procedure with minimal skin approaches was proposed for indirect reduction and rigid fixation of displaced intraarticular calcaneal fractures, while decreasing hazards of traditional operations.

The study was conducted from April 2017 to February 2021 on 26 patients with displaced intraarticular calcaneal fractures either comminuted and/or associated with poor skin condition treated with minimal invasive reduction and Ilizarov fixation. Twenty two male and four female individuals, with a median age of 38.6 (range, 19-59) years were included. . According to Sanders CT sorting, 8 fractures were type II, 11 type III, and 7 type IV. The mean follow-up was 26 (range, 24-33) months. Radiological assessment involved x-rays and CT images for evaluation of malalignment, Böhler angle, and calcaneal dimensions (height and width). Meanwhile, functional evaluation was reported using The American Orthopedic Foot & Ankle Society (AOFAS) score. Power test, Chi-square test, statistical package for social science (SPSS), and Mann Whitney test (non-parametric test) were used for statistical analysis.

According to AOFAS scale for ankle and hindfoot, 8 excellent cases, 11 good, 5 fair, and 2 poor were observed. The average score was 81 (range, 49-92). Axial malalignment was less than 10 degrees in 22 cases. The mean calcaneal height and width could restore 92% and 115% of normal, respectively. The mean Böhler's angle was improved from  $10 \pm 7$  SD preoperatively to  $25 \pm 4$  SD degress postoperatively. Fractures union was achieved at a median of 9 (range, 7-13) weeks. Although superficial pin site infection (73.1%) was common, serious complications including complex regional pain syndrome (3.8%), persistent foot pain (7.6%), subtalar osteoarthritis (26.9%), and calcaneocuboid osteoarthritis (11.5%) were less common. Fortunately, all patients except one could return to their pre-injury work.

Good reduction, stable fixation, satisfactory radiographic and functional results could be attained through a minimum approach and Ilizarov fixation for managing intraarticular calcaneal fractures especially in patients with poor skin condition and/or comminuted fractures.