

MIS Outcomes: Post-operation follow-up in patients who received Minimally Invasive Surgery in Foot and Ankle

Ivy C. Lee, Justin Luk, Rohith K Ryali, Ronit Avadhuta, Aayush Chirayu Mehta, Soheil Ashkani Esfahani, Fernando C Raduan, Christopher Miller, Lorena Bejarano-Pineda

INTRODUCTION:

Calcaneal osteotomies are traditionally used to correct varus or valgus hindfoot deformities. While open calcaneal osteotomies have successfully achieved appropriate correction of the deformities, they are associated with complications such as sural nerve injury and wound complications. Minimally invasive surgery (MIS) has emerged as an alternative and has been associated with a lower rate of wound complications, post-surgical pain and lower hospitalization time. However, direct comparative data between MIS and open medializing/lateralizing osteotomies remains limited. This study aims to evaluate whether the surgical approach can influence patient outcomes and complication rates following calcaneal osteotomy.

METHODS:

A retrospective chart review of patients who underwent medializing or lateralizing calcaneal osteotomies at a tertiary hospital from January 2019 to June 2023, with a minimum of 12-month follow-up was performed. One hundred and ten eligible patients were identified, with demographics, comorbidities, surgical technique (MIS vs. Open), osteotomy type (Medializing vs. Lateralizing vs. Zadek), complication rates, additional procedures, and duration of follow-up collected from electronic health records. Patients were stratified by surgical technique and osteotomy type. Outcomes included incidence of postoperative complications, nonunion, additional procedures, and revision surgery. Fisher's exact test and chi-squared test were done for categorical comparisons, with significance set at $P < 0.05$.

RESULTS:

A total of 110 patients met eligibility criteria for inclusion. Medializing osteotomies were performed in 49 cases (45%), lateralizing in 28 (26%) cases, and Zadek in 4 (4%). Of medializing osteotomies, 33 were open and 14 were MIS; for lateralizing, 19 were open and 9 MIS. All Zadek osteotomies were MIS. Patients with diabetes were more likely to undergo MIS procedures ($P < 0.01$, Fisher's Exact). Complication rates were not statistically different based on the surgical approach (MIS vs open) or type of osteotomy ($P = 0.68$, Chi-square; $P = 0.14$, Fisher's Exact). Revision surgery was performed in 12 patients, with no difference between MIS / open groups. No significant differences were observed in hardware removal, nonunion, or medical complication rates by surgical approach (MIS vs open). There was no correlation between having a medical complication excluding a-fib and the modality of surgery ($P = 1.00$, Fisher's Exact).

DISCUSSION AND CONCLUSION:

The presence of diabetes increased the likelihood of having an MIS procedure. Despite a higher comorbidity burden among patients receiving MIS, both MIS and open calcaneal osteotomies demonstrated comparable complication and revision rates. These findings support MIS calcaneal osteotomy as a safe and effective alternative to open techniques offering benefits of reduced soft tissue related complications and faster operative recovery for patients with diabetes.