Comparison of Outcomes between Two Surgical Approaches for Intra-Articular Calcaneal Fractures: Minimally Invasive Sinus Tarsi versus Extensile Lateral Approach

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Summary:
Two common surgical approaches are used for displaced intra-articular calcaneal fractures such as the minimally invasive sinus tarsi and extensile lateral approach. The purpose of this study was to compare the outcomes between these two approaches for intra-articular calcaneal fractures. The final clinical and radiographic outcomes between the two approaches for displaced intra-articular calcaneal fractures were comparable and equally successful. The selective minimally invasive sinus tarsi approach appears to be an effective and reliable method for treating intra-articular calcaneal fractures.

Introduction:
Intra-articular calcaneal fractures are common, but optimal treatment remains challenging and controversial. Open reduction and internal fixation are currently considered the gold standard treatment for this fracture. Two common surgical approaches are used for displaced intra-articular calcaneal fractures such as the minimally invasive sinus tarsi and extensile lateral approach. The purpose of this study was to compare the outcomes between these two approaches for intra-articular calcaneal fractures.
Methods:
We retrospectively reviewed 98 cases in 93 patients from September 2004 to December 2010, who were treated with open reduction and internal fixation for displaced intra-articular calcaneal fractures and were followed minimal 48 months duration. The study group included 38 patients who underwent minimally invasive sinus tarsi approach and 60 who underwent the extensile lateral approaches. American Orthopedic Foot and Ankle Society (AOFAS) ankle-hindfoot scale scores, visual analog scale (VAS) scores, and the Foot Function Index (FFI) were used to evaluate the clinical outcomes. The preoperative, last follow-up changes in the Böhler angle, Gissane angle, calcaneal length, calcaneal height, and calcaneal width were analyzed radiographically.

Results:
Mean AOFAS score was 27.4 in the sinus tarsi group and 27.1 in the extensile lateral group preoperatively, and these improved to 88.6 and 86.8 at the final follow-up, respectively. Mean VAS score was 7.6 in the sinus tarsi group and 7.7 in the extensile lateral group preoperatively and these improved to 2.1 and 2.3 at the final follow-up visits. Mean FFI was 135.1 in the sinus tarsi group and 136.3 in the extensile lateral group preoperatively and these improved to 22.1 and 22.8 at the final follow-up. No significant differences in clinical outcomes were observed between the groups. Mean Böhler angle in the sinus tarsi and extensile lateral groups showed improvement, from 17.9 and 18.3 preoperatively, to 26.7 and 25.1 at the final follow-up, respectively. Mean Gissane angle in the sinus tarsi group and extensile lateral groups showed improvement, from 121.1 and 118.7 preoperatively, to 115.2 and 116.8 at the final follow-up, respectively. Mean calcaneal height, length, and width in the sinus tarsi and extensile lateral groups showed improvement, from 40.3, 76.3, 39.5 and 40.7, 75.1, 41.0 preoperatively, to 46.1, 77.4 6, 38.3 and 46.3, 76.1, 39.0 at the final follow-up, respectively. No significant differences in radiographic outcomes were observed between the groups. However, wound complication rate (13.3%) in the extensile lateral group was significantly higher than that (0%) in the sinus tarsi group.

Conclusion:
The final clinical and radiographic outcomes between the two approaches for displaced intra-articular calcaneal fractures were comparable and equally successful. However, the extensile lateral group had a significantly higher incidence of wound complications than that in the sinus tarsi group. The selective minimally invasive sinus tarsi approach appears to be an effective and reliable method for treating intra-articular calcaneal fractures.