Operative Treatment of Intraarticular Calcaneal Fractures in the Pediatric Population

Reference:

Scientific Literature Reviews

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Podiatric Relevance:
Pediatric calcaneal fractures are rare, compared to those in adults. They usually occur as a result of low energy injuries, are minimally or non-displaced and extra-articular, and are often not identified on initial radiographs. Displaced intra-articular fractures, much more common in adults, result from high-energy trauma. The standard of care for these fractures is open reduction and internal fixation (ORIF), but non-operative management is the generally accepted standard in children with similar injuries. The goal of this study was to analyze the outcomes of displaced intra-articular calcaneal fractures in children treated surgically.

Methods:
This was a retrospective case series study, including 14 displaced intra-articular calcaneal fractures in 13 patients (average age of 11.7 years), treated with ORIF during a five and ½ year period and reviewed over an average of 67 months postoperatively. Exclusion criteria included non-ambulatory children, open fractures and closed ankle physes. All surgery was performed at one institution, involving eight surgeons exercising similar surgical technique. Preoperative radiographs and computed tomographic (CT) scans were reviewed and each fracture was classified by the Essex-Lopresti and Sanders classification systems. The same imaging studies and classifications systems were performed and applied postoperatively. Functional outcomes were assessed according to the American Orthopaedic Foot and Ankle Society (AOFAS) hindfoot score.

Results:
Of the 14 fractures treated by ORIF, there were 7 tongue-type and 7 joint depression-type injuries (Essex-Lopresti), and 9 type II, 5 type III and no type IV injuries (Sanders). The average Bohler angle was 11.8 degrees preoperatively and 28.4 degrees postoperatively. Overall, postoperative outcomes were good when proper surgical technique was utilized. Postoperative complications were few and minor, and were treated successfully with conservative measures, one requiring hardware removal. The average AOFAS hindfoot score was 64 of 68.

Conclusions:
Children and adolescents who suffered high-energy calcaneal trauma demonstrated fracture patterns similar to adults. In this limited study, the authors reported successful outcomes when applying surgical treatment as would be done in adults. Prospective trials are encouraged to evaluate operative versus nonoperative treatment of these complex injuries.