

Is there a Benefit to Rigid Fixation in Calcaneal Lengthening Osteotomy in Painful Pediatric Idiopathic Flatfoot Deformity? Comparing Results of Kirschner Wire versus Plate Fixation

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INTRODUCTION:

Flexible flatfoot (FF) is a common pediatric condition that is mostly asymptomatic, and surgical intervention is only considered when painful FF is refractory to conservative treatment. Calcaneal lengthening osteotomy (CLO) is one of the most commonly used procedures to address painful FF. Traditionally, Kirschner wires were used for fixation, but there has been a recent increase in the use of plates. We compared the clinical and radiographic outcomes of these two fixation methods.

METHODS:

This single-center retrospective study included children aged 8-18 years with symptomatic FF that received CLO using K-wire or plate fixation. Primary outcomes include weight-bearing radiographic measurements and complications following surgery. Secondary outcomes included patient-reported outcomes. Statistical significance was held at 0.05.

RESULTS: Among 102 feet (65 patients), 42 feet (41.2%) underwent K-wire and 60 feet (58.8%) underwent plate fixation. No differences in casting duration ($p=0.525$) and time to radiographic healing ($p = 0.17$) were noted. Total complications were higher in the plate cohort (12 vs. 2, $p = 0.04$) due to a higher rate of reoperations (16.7%) for hardware-related pain (10 vs. 0; OR 17.74, 95% CI [1.01, 310.54], $p < 0.05$), and infection rates were similar. Both interventions significantly improved ($p \leq 0.001$) AP Talo-first metatarsal and calcaneal pitch angles. Irrespective of intervention, CLO significantly improved pain at 6 months and mobility scores at 12 months. Neither modality demonstrated superior pain or mobility scores at final follow up.

DISCUSSION AND CONCLUSION:

Both K-wire and plate fixations lead to similar radiographic and functional outcomes after CLO in painful, pediatric flatfeet. Compared to K-wire fixation, plates cause a 17.7-fold increased risk of reoperations for painful hardware, with 16.7% of plated cases requiring reoperation. Noting this, along with the higher costs associated with using plates, our study advocates for K-wire fixation for children undergoing CLO.

