Total Ankle Arthroplasty: Analysis of Arc of Motion and Functional Outcomes

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Category: Ankle,Ankle Arthritis

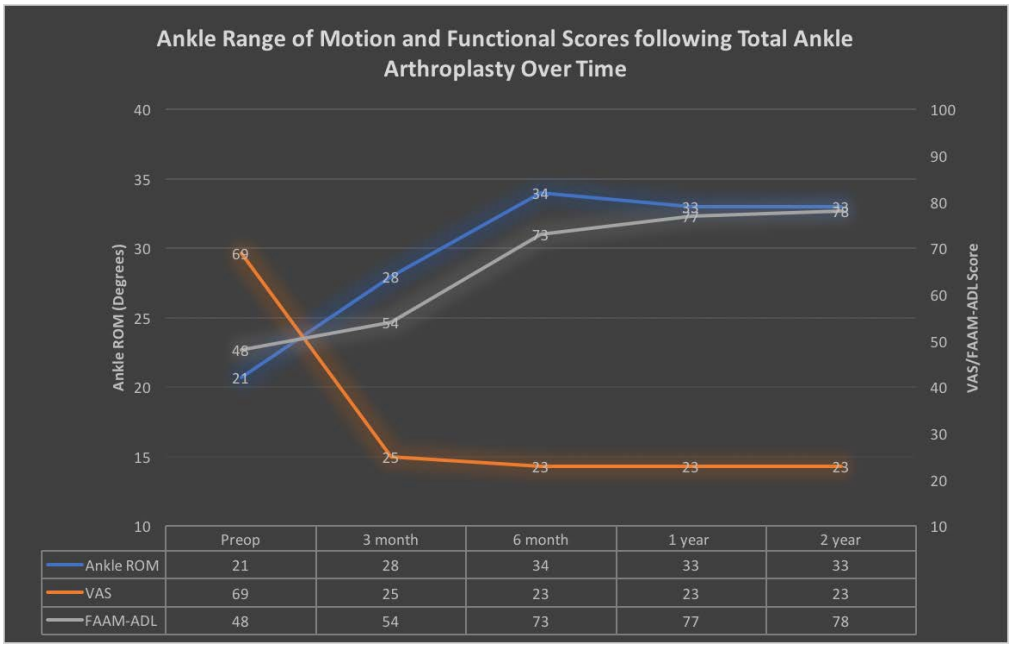
Keywords: ankle, arthroplasty, range, motion, replacement, dorsiflexion, plantarflexion, outcomes, arc, total,

Introduction/Purpose: Reports of ankle range of motion and how it affects patient outcomes following total ankle arthroplasty (TAA) have been mixed. Furthermore, recent studies have relied on clinical exam to obtain postoperative range of motion and have lacked preoperative functional scores. The purpose of our study was to analyze how preoperative range of motion and functional scores change with time following TAA using postoperative functional scores and radiographs for range of motion calculations.

Methods: A retrospective chart review was performed on 107 patients (109 ankles) that had undergone fixed-bearing implant TAA by a single surgeon between 2010 and 2015. Preoperative range of motion was gathered clinically in office by the senior author. Postoperative range of motion through the ankle joint was evaluated with dedicated weight-bearing maximum dorsiflexion and plantarflexion lateral radiographs at 3 and 6 months, 1 and 2 years. The range of motion was measured using the angle measurement tool on the picture archiving and communication system. Patients completed visual analogue scale (VAS) for pain and the Foot and Ankle Ability Measure (FAAM) questionnaire subcategorized into activities of daily (ADL) and sports subscale preoperatively and at postoperative intervals of 3 and 6 months, 1 and 2 years. The mean age was 65 years (range, 31-83 years). Mean BMI was 28.1 (range, 14.9-44.9). There were 53 males (50%).

Results: The mean total arc of ankle motion preoperatively was 20.7 degrees and improved significantly to 28.3, 34.3, 33.3, and 33.3 degrees at 3 and 6 months, 1 and 2 years, respectively ($P<0.001$) (Figure 1). Mean VAS pain and mean FAAM ADL preoperative scores improved significantly at each postoperative time point as seen in Figure 1 ($P<0.001$). Increased ankle range of motion was correlated with lower VAS preoperatively ($r=-0.38$, $P=0.007$), and at 1 year ($r=-0.36$, $P<0.001$), and 2 years ($r=-0.2$, $P=0.033$) postoperatively. Increased ankle range of motion was significantly correlated with higher FAAM-ADL at 3 months ($r=0.48$, $P=0.012$), 1 year ($r=0.24$, $P<0.034$), and 2 years ($r=0.37$, $P<0.001$) postoperatively.

Conclusion: Patients undergoing fixed-bearing TAA had continued and sustained improvement from preoperative total arc of motion, pain, and function at each postoperative visit, up to 2 years. Ankle range of motion was noted to peak at 6 months, while pain and FAAM-ADL continued to improve up to 2 years postoperatively. Patients with greater ankle range of motion correlated with less pain and improved function at 1 and 2 years postoperatively. Though pain and function may continue to improve even as far out as 2 years postoperatively, it is not likely that range of motion will continue to increase.



Foot & Ankle Orthopaedics, 3(2)
DOI: 10.1177/2473011418S00015