

## Comparison of treatment outcomes of Arthrodesis and Two Generations of Ankle Replacement Implants

Bruce Sangeorzan, MD, William Ledoux, PhD, Marisa Rose Benich, BSc, Michael Orendurff, PhD, Sigvard Hansen, MD, James Davitt, MD, John Anderson, MD, Donald Bohay, MD, FACS, J. Chris Coetzee, MD, Michael Brage, MD, Michael Houghton, MD

**Category:** Ankle, Ankle Arthritis, Arthroscopy, Trauma

**Keywords:** Ankle arthritis, ankle replacement, ankle arthrodesis, comparative effectiveness, patient reported outcomes, arthrodesis vs. arthroplasty

**Introduction/Purpose:** We tested clinical equipoise in ankle arthrodesis and ankle arthroplasty during a time of transition from older to newer generation implants using a prospective cohort.

**Methods:** We performed a prospective cohort study comparing outcomes in 273 consecutive patients treated for ankle arthritis by arthrodesis or ankle arthroplasty between 2005 and 2011. Adult Patients with end-stage ankle arthritis, who were ambulatory and willing and able to respond to surveys were included. Patients were excluded from the study if they had another significant lower limb problem that might affect ambulation. At baseline and at 6, 12, 24, and 36 months follow up visit, participants completed a pain and satisfaction survey, a Musculoskeletal Function Assessment (MFA), and a Short Form-36 (SF-36) survey. Surgery was performed by surgeons trained in both foot and ankle reconstruction and hip and knee arthroplasty. The participants were primarily enrolled from a tertiary teaching hospital but also at three sites in different states that included both teaching hospitals and private practice settings.

**Results:** Linear mixed effects regression adjusted for baseline differences (age, BMI, and surgery type.) There were no significant baseline differences in MFA or SF-36 by surgery type. There was significant mean improvement after surgery regardless of procedure ( $p < 0.001$ ). The greatest improvement occurred at 6 month follow-up; Mean  $\pm$  SE, (%) improvement was  $12.6 \pm 0.7$ , (32%) for MFA,  $22.0 \pm 1.4$ , (58%) for Physical Function (PF);  $32.4 \pm 1.6$ , (96%) for Bodily Pain (BP),  $4.0 \pm 0.2$ , (60%) for pain score. Average improvement was significantly better with arthroplasty in MFA ( $3.6 \pm 1.6$ ,  $p = 0.023$ ) and in PF ( $7.5 \pm 2.9$ ,  $p = 0.0098$ ). The difference between arthrodesis and arthroplasty was greater for patients receiving the newer Salto Talaris implant; average improvement for MFA ( $3.9 \pm 1.4$ ,  $p = 0.031$ ), PF ( $8.8 \pm 3.3$ ,  $p = 0.0074$ ), BP ( $7.3 \pm 3.6$ ,  $p = 0.045$ ), and pain score ( $0.8 \pm 0.4$ ,  $p = 0.038$ ).

### Conclusion: Conclusions

Both ankle replacement and ankle arthrodesis are highly effective treatments for ESAA. When treated by surgeons with expertise in both foot reconstruction and hip and knee arthroplasty, patients reported improved comfort and function with both treatments. Average improvement was significantly better in those with arthroplasty in MFA and in SF-36 PF scale ( $7.5 \pm 2.9$ ,  $p = 0.0098$ ). That difference was greater when earlier generation implants were removed from the analysis. Younger patients had greater functional improvements than older patients. Patients with low BMI had better improvement than those with high BMI.

---

Foot & Ankle Orthopaedics, 2(3)  
DOI: 10.1177/2473011417S000352  
©The Author(s) 2017