

Revision Total Ankle Arthroplasty Outcomes in a Large Single-Center Series: Evaluation of Coronal Plane Deformity Correction and Patient-Reported Measures

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INTRODUCTION: As total ankle arthroplasty (TAA) rises in popularity nationwide, the incidence of major complications and need for revision TAA will continue to increase. A better understanding of the ability to durably correct deformity and improve patient-reported outcomes (PROs) in the TAA revision setting is paramount for surgeons facing the impending wave of failed TAA. Thus, the purpose of this study was to present the largest single-center case series of revision TAA to date and to evaluate improvement in PROs and maintenance of correction of coronal plane deformity in patients undergoing this procedure.

METHODS: This was a single-center, retrospective review of 87 revision TAAs performed between 2007 and 2022. Reoperations for cyst formations only or without metallic component exchange were excluded. There were two most common implants used for revision TAA - one with n=65 and the other n=14. Mean follow up was 2.8 ± 2.9 years. Data on patient preoperative characteristics, concurrent procedures, and postoperative complications were collected. The primary outcome measures were time to major complication, reoperation, and infection. Secondary outcomes included PROs and correction of coronal plane deformity measured from both the tibial plafond and talar articulating surface from pre- to postoperatively. Cox regression analyses were performed to compute survivorship.

RESULTS: The most common concurrent procedures performed concomitantly with revision TAA were gastrocnemius recession (n=31, 35.6%), subtalar arthrodesis (n=18, 20.7%), and talonavicular arthrodesis (n=5, 5.7%). Mean preoperative coronal plane deformity measured off both the tibial plafond and talar articular surface improved after revision TAA. One- and 5-year survivorship from major complication, reoperation, and infection is shown in Table 2. Fourteen patients underwent subsequent revision, including TAA (n= 6, 6.9%), arthrodesis (n= 4, 4.6%), below-the-knee amputation (n= 2, 2.3%), or implantation of an antibiotic spacer (n= 2, 2.3%). At one-year postoperatively, mean VAS pain score, SF36, and AOFAS Hindfoot score was 18.2 ± 16.0, 73.0 ± 13.3, and 68.8 ±9.3, respectively, representing an improvement in PROs after revision TAA.

DISCUSSION AND CONCLUSION: In the largest single-center series of patients undergoing single or double component exchange revision TAA, we demonstrate durable improvements in coronal plane deformity measured off both the tibial plafond and talar articular surface. We also noted 63.0% survivorship with regard to reoperation and improvements in average PROs across the cohort. Overall, revision TAA is a successful procedure, but is associated with higher failure rates at 5 years than primary TAA.

Table 1. Patient Demographics

Demographics	Total (N= 87)
Follow-up (yrs), Mean (SD)	2.77 (2.92)
Male, n (%)	41 (47.1)
Caucasian Race, n (%)	83 (95.4)
Age at Primary Surgery, Mean (SD)	57.94 (12.35)
Age at Revision Surgery, Mean (SD)	64.33 (10.17)
BMI (kg/m ²), Mean (SD)	30.76 (5.83)
Current Smoker, n (%)	1 (1.2)
Never Smoker, n (%)	48 (55.8)
Former Smoker, n (%)	37 (43.0)
Rheumatoid Arthritis, n (%)	7 (8.0)
Diabetes, n (%)	13 (14.9)

Table 2. Survivorship 1- and 5-Years Following Revision Total Ankle Arthroplasty

Survivorship	Year	Number at Risk	Number of Events	Survival [95%CI]
Any Complication	1	50	17	78.2 [69.4-88.0]
	5	10	10	40.3 [27.5-59.1]
Major Complication	1	54	7	91.0 [84.9-97.6]
	5	10	6	62.3 [46.2-83.9]
Reoperation	1	54	6	92.2 [86.3-98.4]
	5	10	6	63.0 [46.8-84.9]
Infection	1	58	2	97.7 [94.6-100.0]
	5	14	2	86.1 [73.5-100.0]