Increased Readmission Rate and Proportion of Smokers, but not Diabetics, in Revision TAA Patients compared to Primary TAA Patients

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INTRODUCTION: Total ankle arthroplasty (TAA) is a motion sparing procedure utilized as an alternative to ankle fusion. 10-year failure rates can approach up to 30 percent, with common failure mechanisms including periprosthetic fracture, prosthetic joint infection, aseptic loosening, or component subsidence. Due to the high failure rate of these prostheses, understanding risk factors for revision, as well as outcomes of revision operations is of utmost importance to the foot and ankle surgeon to best counsel patients as well as to prepare for complications. There is a paucity of previous studies investigating these factors in a revision population. The purpose of the present study is to identify risk factors and demographic features as well as assess the hospital readmission rate of revision TAA patients compared to those undergoing primary TAA.

METHODS: Institutional review board approval was obtained. A database of all patients from 1/1/2007 to 1/1/2024 with a CPT and ICD codes indicating a TAA and readmission to the emergency department within 1 year of their procedure was created from the electronic medical record. Demographic and clinical data were collected for the study sample including age, sex, race, ethnicity, insurance, age at time of surgery, body mass index (BMI), smoking status and patient comorbidities. In addition, readmission data and TAA component company and sizing were recorded. Descriptive statistics were conducted, and Kruskal-Wallis and Fischer Exact statistics were used for analysis between the primary TAA cohort and the patients who underwent a revision TAA.

RESULTS: Sixty-six patients were included in the revision TAA cohort, and 303 in the primary TAA cohort. Twenty-three (34.8%) patients in the revision cohort compared to 21(6.9%) in the primary cohort were readmitted to the hospital during the follow up period (p<0.0001). There were no statistically significant differences in implant type, race, ethnicity, sex, BMI, insurance type, or diabetes between the two cohorts. There were 43.9% and 16.7% of patients in revision cohort who were former and current smokers respectively, compared to 38.3% and 7.6% in the primary TAA cohort (p=0.03). Median revision TAA patients' age of first surgery was 61 compared to 64 in the primary cohort (p=0.04).

DISCUSSION AND CONCLUSION: In our study, 34.8% of revision TAA patients were readmitted to the hospital compared to 6.9% of primary TAA patients. Revision TAA patients were younger at the time of their first surgery and more likely to be smokers. However, they had a similar proportion of diabetes and median BMI, suggesting that these are not significantly contributing risk factors. This corroborates previous studies that did not find higher revision rates in diabetics, though contradicts previous studies that have found obesity to be a risk factor for revision. Foot and ankle surgeons may use the data presented to better counsel patients on outcomes as well as select candidates for primary and revision TAA.

	Primary TAA (N=303)	Revision (N#66)	Total (N=369)	P-value
Sex. n (%)	(11-000)	(11-00)	(1-000)	0.4985
Eomalo	122 (42 02)	22/49 59()	105 (44 75()	
Malo	170 (56 1%)	34 (61 6N)	204 (55 255)	
Page n (%)	110 (00.174)	04 (01.070)	204 (00.070)	0.05201
Risch as African American	E /1 70/1	E /7 69/ \	10 (2 78)	0.0020
Other	0 (1.7 %)	2 (4 6%)	12 (2.2%)	
Tan or More Resea	0 (3.0%)	1 (1 5%)	10 (2 7%)	
White	280 (02 49/)	67 (96 49/)	227 (01 28()	
Ethnicity p (%)	200 (82.476)	57 (00.476)	337 (81.376)	0.55101
Edinicity, II (76)	7 (0 (0))	0.00.000	40 (0.0%)	0.0010
Hispanic, Latino, or Spanish Origin	7 (2.4%)	3 (4.0%)	10 (2.6%)	
Multiple	3 /1 0%)	0.00.0%)	3 (0.8%)	
Not Hispapia Lation or Spanish Origin	281/06 280	62 (05.4%)	242 (06 15)	
nov mapano, caulo, or apanish origin	201 (30.2%)	or (03.470)	Sec (50.139)	
Unavailable	1 (0.3%)	0 (0.0%)	1 (0.3%)	
Missing	11	1	12	
Age at time of Surgery				0.03872
N	301	66	367	
Median (IOR)	64.0 (56.0. 70.0)	61.0 (54.0. 67.0)	63.0 (56.0. 70.0)	
insurance, n (%)				0.32061
Medicaid	35 (11.6%)	5 (7.6%)	40 (10.8%)	
Medicare	114 (37.6%)	20 (30 3%)	134 (36 355)	
Other	5 (1.7%)	2 (3.0%)	7 (1.9%)	
Private	149 (49 2%)	39 (59 1%)	188 (50.9%)	
BMI				0.55102
N	205	66	281	
Median (IOR)	21 2/27 8 28 4)	32 4 /20 1 26 2)	21 8 (28.0. 26.4)	
Smoking Status, p.(%)	01.0 (21.0, 00.4)	ua.+ (au.1, uu.a)	01.0 (20.0, 00.4)	0.0251
Current	22 (7.6%)	11 (16 7%)	24 (9.2%)	0.0201
Corrent	23 (7.0%)	11 (10.7%)	34 (0.276)	
Pormer	110 (30.3%)	29 (43.9%)	140 (39.3%)	
Rulmonani Comorbiditios o (%)	104 (04.1%)	20 (39.4%)	190 (51.5%)	0.7579
Pullionary comorbiances, in (35)	000 (05 00)	00 (00 00)	050 (04.05()	0.7570
NO	200 (90.0%)	62 (93.9%)	300 (84.8%)	
Tes	15 (5.0%)	4 (0.1%)	18 (0.176)	4 000001
Diabetes menitus, ii (76)	004 (00 40)	C7 (00 400)	040 (00 00)	1.0000
NO	201 (66.1%)	57 (66.4%)	310 (00.2%)	
Tes	42 (13.9%)	9 (13.6%)	51 (13.6%)	4 00001
Rneumatologic Comorbidities, n (%)				1.00001
No	284 (93.7%)	62 (93.9%)	346 (93.8%)	
Yes	19 (6.3%)	4 (6.1%)	23 (6.2%)	
Renal Comorbidities, n (%)				0.7101
No	293 (96.7%)	63 (95.5%)	356 (96.5%)	
Yes	10 (3.3%)	3 (4.5%)	13 (3.5%)	
Readmission, n (%)				<.00011
No	282 (93.1%)	43 (65.2%)	325 (88.1%)	
Yes	21 (6.9%)	23 (34.8%)	44 (11.9%)	