

# Association of Rheumatoid Arthritis and Immunomodulatory Therapy with Postoperative Complications After Total Ankle Arthroplasty

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**INTRODUCTION:** Prior studies have reported variable outcomes for rheumatoid arthritis (RA) patients undergoing total ankle arthroplasty (TAA), but many have been limited by small sample sizes, shorter follow-up periods, and a lack of consideration for immunomodulatory therapy (IMT). Thus, the purpose of this study was to evaluate 90-day and 5-year complications in RA patients undergoing TAA, including the influence of IMT use, compared to controls.

**METHODS:** A large administrative claims database was utilized to identify RA patients undergoing TAA (n=762) and non-RA controls undergoing TAA (n=9,415). All patients had a minimum of five years of follow-up. Logistic regression analysis, adjusted for age, gender, Charlson comorbidity index (CCI), and its specific comorbidity components, was utilized to evaluate the association between RA and post-TAA complications. Complications within 90 days and 5 years of TAA were compared between groups. Subgroup analyses were performed evaluating those with IMT use, including both traditional disease modifying antirheumatic drugs (DMARDs) and biologics. A Bonferroni correction was applied, and statistical significance was set to p<0.003.

**RESULTS:** RA patients had a significantly higher rate of wound dehiscence compared to controls (5.8% vs 2.6%; OR: 1.86; 95% CI: 1.30-2.62, p<0.001). Rates of all other medical complications, emergency department (ED) visits, and readmission within 90 days were comparable between groups. Additionally, there were no significant differences in the rates of revision surgery, periprosthetic joint infection (PJI), aseptic loosening, or periprosthetic fracture within five years between patients with RA and controls. In the subgroup analysis, patients with RA on IMT within 90 days of surgery demonstrated a higher rate of wound dehiscence compared to controls (8.0% vs 2.6%; OR: 2.78; 95% CI: 1.64-4.49; p<0.001). There were no significant differences in rates of other 90-day medical complications or 5-year surgical complications between these patients and controls. Among patients with RA not on IMT, there were no significant differences in the rates of 90-day medical complications or 5-year surgical complications compared to controls.

**DISCUSSION AND CONCLUSION:** Patients with RA undergoing TAA exhibited an increased risk of postoperative wound dehiscence, particularly among those receiving IMT. However, rates of other short-term medical complications and long-term surgical outcomes were comparable to patients without RA. These findings suggest that while RA patients, especially those on immunosuppressive medications, may require closer perioperative wound monitoring, their overall outcomes after TAA remain similar to those without RA.

Table 1. Overall 90-Day Medical and 5-Year Surgical Complications Compared Between Groups

Complication	Control (n=9415)	RA (n=762)	Odds Ratio (95% CI)	P-value
<b>90-Day Complications</b>				
Myocardial Infarction	8 (0.1%)	1 (0.1%)	1.48 (0.07-9.65)	0.73
Pneumonia	67 (0.7%)	10 (1.3%)	1.25 (0.58-2.41)	0.54
Pulmonary Embolism	47 (0.5%)	6 (0.8%)	1.14 (0.42-2.59)	0.77
DVT	84 (0.9%)	10 (1.3%)	1.21 (0.57-2.30)	0.59
UTI	184 (2.0%)	34 (4.5%)	1.44 (0.96-2.11)	0.068
Wound Dehiscence	244 (2.6%)	44 (5.8%)	<b>1.86 (1.30-2.62)</b>	<b>&lt;0.001</b>
Sepsis	17 (0.2%)	5 (0.7%)	3.18 (1.00-8.64)	0.033
AKI	53 (0.6%)	8 (1.0%)	1.24 (0.53-2.59)	0.59
Surgical Site Infection	88 (0.9%)	15 (2.0%)	1.54 (0.83-2.68)	0.14
ED Visit	864 (9.2%)	88 (11.5%)	1.00 (0.78-1.29)	0.94
Readmission	285 (3.0%)	31 (4.1%)	1.01 (0.66-1.47)	0.98
<b>5-Year Complications</b>				
Revision	212 (2.3%)	24 (3.1%)	1.41 (0.88-2.17)	0.14
Periprosthetic Joint Infection	275 (2.9%)	35 (4.6%)	1.42 (0.96-2.04)	0.065
Aseptic Loosening	596 (6.3%)	68 (8.9%)	1.45 (1.09-1.90)	0.010
Fracture	40 (0.4%)	3 (0.4%)	0.89 (0.21-2.57)	0.86

Table 3. 90-Day Medical and 5-Year Surgical Complications Compared Between Those on IMT or not on IMT and Controls.

Complication	Control (n=9415)	RA on IMT (n=251)	Odds Ratio (95% CI)	P-value	RA not on IMT (n=511)	Odds Ratio (95% CI)	P-value
<b>90-Day Complications</b>							
Myocardial Infarction	8 (0.1%)	0 (0.0%)	NA	NA	1 (0.2%)	1.83 (0.09-12.19)	0.59
Pneumonia	67 (0.7%)	0 (0.0%)	NA	NA	10 (2.0%)	1.89 (0.89-3.67)	0.074
Pulmonary Embolism	47 (0.5%)	3 (1.2%)	2.02 (0.47-5.90)	0.26	3 (0.6%)	0.81 (0.19-2.32)	0.74
DVT	84 (0.9%)	3 (1.2%)	1.16 (0.28-3.25)	0.81	7 (1.4%)	1.21 (0.50-2.52)	0.64
UTI	184 (2.0%)	11 (4.4%)	1.33 (0.66-2.42)	0.39	23 (4.5%)	1.46 (0.90-2.27)	0.11
Wound Dehiscence	244 (2.6%)	20 (8.0%)	<b>2.78 (1.64-4.49)</b>	<b>&lt;0.001</b>	24 (4.7%)	1.43 (0.89-2.18)	0.12
Sepsis	17 (0.2%)	2 (0.8%)	3.83 (0.58-14.87)	0.088	3 (0.6%)	2.77 (0.62-8.24)	0.12
AKI	53 (0.6%)	4 (1.6%)	2.02 (0.58-5.32)	0.20	4 (0.8%)	0.89 (0.26-2.27)	0.83
Surgical Site Infection	88 (0.9%)	7 (2.8%)	2.27 (1.00-5.15)	0.048	8 (1.6%)	1.19 (0.52-2.38)	0.65
ED Visit	864 (9.2%)	26 (10.4%)	0.87 (0.55-1.31)	0.53	62 (12.1%)	1.07 (0.79-1.41)	0.66
Readmission	285 (3.0%)	10 (4.0%)	0.98 (0.47-1.82)	0.96	21 (4.1%)	1.00 (0.61-1.56)	0.99
<b>5-Year Complications</b>							
Revision	212 (2.3%)	11 (4.4%)	2.03 (1.01-3.70)	0.031	13 (2.5%)	1.14 (0.61-1.97)	0.65
Periprosthetic Joint Infection	275 (2.9%)	12 (4.8%)	1.61 (0.83-2.86)	0.13	23 (4.5%)	1.34 (0.84-2.05)	0.19
Aseptic Loosening	596 (6.3%)	26 (10.4%)	1.74 (1.11-2.62)	0.011	42 (8.2%)	1.31 (0.93-1.82)	0.11
Fracture	40 (0.4%)	2 (0.8%)	2.05 (0.47-8.94)	0.34	1 (0.2%)	0.41 (0.02-1.95)	0.38