

Chronic Steroid Use Does Not Increase Risk of Superficial Surgical Site Infection or Wound Dehiscence Following Total Ankle Arthroplasty

Alexander R. Garcia, BS¹, Kenny Ling, MD², Evan Olsen, BS¹, David Komatsu, PhD², Megan Paulus, MD²

¹Renaissance School of Medicine at Stony Brook University, Stony Brook, NY, USA, ²Department of Orthopaedics and Rehabilitation, Stony Brook University, Stony Brook, NY, USA.

Alexander.garcia@stonybrookmedicine.edu

Disclosures: Alexander R. Garcia (N), Kenny Ling (N), Evan Olsen (N), David Komatsu (N), Megan Paulus (Arthrex, Redpoint Medical)

INTRODUCTION: Total ankle arthroplasty (TAA) is an effective treatment for end-stage ankle arthritis. Recent surgical and technologic advances have led to a significant increase in surgical volume of TAA. While a majority of ankle arthritis is post-traumatic in nature, other causes include autoimmune or inflammatory conditions. Medical management of these conditions frequently requires chronic corticosteroid administration, which is a well-established risk factor for complications following surgery. The purpose of this study was to investigate the association between chronic preoperative steroid use and postoperative complications following TAA.

METHODS: The American College of Surgeons National Surgical Quality Improvement (NSQIP) database was queried for all patients who underwent TAA between 2015-2020. Patient demographics, comorbidities, surgical characteristics, and 30-day postoperative complication data were collected. Bivariate and multivariate logistic regression were used to identify postoperative complications associated with chronic preoperative steroid use.

RESULTS SECTION: 1,606 patients were included in this study: 1,533 (95.5%) were included in the non-steroid cohort and 73 (4.5%) were included in the chronic steroid cohort. Chronic steroid use was significantly associated with female sex ($p<0.001$) and ASA ≥ 3 ($p<0.001$). Chronic steroid use was not associated with superficial SSI ($p=0.634$) or wound dehiscence ($p=0.999$). The postoperative complication that was significantly associated with chronic steroid use was sepsis ($p=0.031$). After adjusting for female sex and ASA grade, chronic steroid use was found to be independently associated with sepsis ($p=0.013$).

DISCUSSION: Preoperative chronic steroid use is not associated with superficial SSI or wound dehiscence within 30 days following TAA. As TAA continues to become a more attractive alternative to ankle arthrodesis, a better understanding of preoperative risk factors can aid in widening indications and knowing what patients are truly at risk for complications. This investigation was limited in respect to the power of the study. Although the use of TAA has been increasing, it is still relatively uncommon with respect to other joint arthroplasties, resulting in a relatively smaller sample size. Regardless of the limitations, this study adds to the data available for ankle arthrodesis complications in chronic steroids users.

SIGNIFICANCE/CLINICAL RELEVANCE: This investigation adds to the data of preoperative risk factors for TAA which is an increasingly used procedure. The data supports utilizing TAA in chronic steroid users without significantly increased risk of superficial SSI or wound dehiscence.

Table 1. Patient demographics/comorbidities for patients with and without chronic steroid use. Bold p-values indicate statistical significance with $p<0.05$.

Characteristic	Non-steroid		Chronic steroid		p-value
	Number	Percent	Number	Percent	
Total	1533	100.0%	73	100.0%	
Age					0.802
18-39	55	3.6%	3	4.1%	
40-64	715	46.6%	38	52.1%	
65-74	533	34.8%	22	30.1%	
≥ 75	230	15.0%	10	13.7%	
Body mass index (kg/m ²)					0.356
<18.5	2	0.1%	0	0.0%	
18.5-29.9	703	45.9%	42	57.5%	
30.0-34.9	451	29.4%	17	23.3%	
35.0-39.9	249	16.2%	11	15.1%	
≥ 40	128	8.3%	3	4.1%	
Gender					<0.001
Female	674	44.0%	49	67.1%	
Male	859	56.0%	24	32.9%	
Functional health status					0.063
Independent	1523	99.3%	71	97.3%	
Dependent	10	0.7%	2	2.7%	
ASA classification					<0.001
1-2	926	60.4%	27	37.0%	
≥ 3	607	39.6%	46	63.0%	
Diabetes mellitus					0.283
No	1355	88.4%	63	86.3%	
Non-insulin dependent	141	9.2%	6	8.2%	
Insulin dependent	37	2.4%	4	5.3%	
Current smoking status					0.387
No	1405	91.7%	69	94.5%	
Yes	128	8.3%	4	5.3%	
COPD					0.418
No	1494	97.5%	70	95.9%	
Yes	39	2.5%	3	4.1%	
Congestive heart failure					0.999
No	1526	99.5%	73	100.0%	
Yes	7	0.5%	0	0.0%	
Hypertension					0.777
No	719	46.9%	33	45.2%	
Yes	814	53.1%	40	54.8%	
Bleeding disorders					0.418
No	1494	97.5%	70	95.9%	
Yes	39	2.5%	3	4.1%	
Operative duration (min)					0.657
<112	360	23.5%	19	26.0%	
112-180	819	53.4%	35	47.9%	
>180	354	23.1%	19	26.0%	

ASA, American Society of Anesthesiologists; COPD, chronic obstructive pulmonary disease

Table 2. Bivariate analysis of 30-day postoperative complications in patients with and without chronic steroid use. Bold p-value indicates statistical significance with $p<0.05$.

Postoperative Complication	Non-steroid (n=1,533)		Chronic steroid (n=73)		p-value
	Number	Percent	Number	Percent	
Septic shock	1	0.07%	0	0.00%	0.998
Sepsis	1	0.07%	1	1.37%	0.031
Urinary tract infection	6	0.39%	0	0.00%	0.999
Deep vein thrombosis	6	0.39%	0	0.00%	0.999
Superficial Incisional SSI	13	0.85%	1	1.37%	0.643
Bleeding transfusions	1	0.07%	0	0.00%	1.000
Unplanned intubation	3	0.20%	0	0.00%	0.999
Wound dehiscence	6	0.39%	0	0.00%	0.999
Myocardial infarction	1	0.07%	0	0.00%	1.000
Organ/space SSI	6	0.39%	0	0.00%	0.999
Pulmonary embolism	4	0.26%	0	0.00%	0.999
Deep incisional SSI	0	0.00%	0	0.00%	0.999
Pneumonia	2	0.13%	0	0.00%	1.000
Stroke	3	0.20%	0	0.00%	0.999
Ventilator > 48 hours	1	0.07%	0	0.00%	1.000
Cardiac arrest	0	0.00%	0	0.00%	0.999
Nonhome discharge	115	7.50%	4	5.48%	0.521
Readmission	22	1.44%	2	2.74%	0.378
Reoperation	12	0.78%	0	0.00%	0.999

SSI, surgical site infection

Table 3. Multivariate analysis of 30-day postoperative complications in patients with chronic steroid use, adjusted for significantly associated patient demographics/comorbidities.

Postoperative Complication	Odds Ratio	95% CI	p-value
Sepsis	38.46	2.14-690.20	0.013

CI, confidence interval