

Tranexamic Use is Associated with Lower Rates of Bleeding Complications but not Transfusions in Revision Total Hip Arthroplasty for Periprosthetic Joint Infection: Is Underdosing to Blame?

Sahil S. Telang BS¹, Julian Wier MD¹, Pranit Kumaran BS¹, Steven H. Liu MD¹, Jacob Becerra MD¹, Jay R. Lieberman MD¹, Nathanael D. Heckmann MD¹
¹Department of Orthopaedic Surgery, Keck School of Medicine of the University of Southern California, Los Angeles, California.
 Email of Presenting Author: sahitel@usc.edu

Disclosures: Sahil S. Telang (N), Julian Wier (N), Pranit Kumaran (N), Steven H. Liu (N), Jacob Becerra (N), Jay R. Lieberman (1-DePuy: A Johnson & Johnson Company, 3B-DePuy: A Johnson & Johnson Company, 4-BD Surgiphor, Hip Innovations Technologies, 7-Saunders/Mosby-Elsevier, 9-AAOS, Hip Society, Musculoskeletal Transplant Foundation, Western Orthopaedic Association), Nathanael D. Heckmann (1-Corin U.S.A., 3B-Intellijoint Surgical, MicroPort Orthopedics, Corin U.S.A., Zimmer, 4-Intellijoint Surgical, 9-AAOS, AJRR, AAHKS, Knee Society)

INTRODUCTION: While tranexamic acid (TXA) is widely used in primary joint arthroplasty, it has not been studied extensively during revision total hip arthroplasty (THA) for periprosthetic joint infection (PJI). This study aimed to evaluate the impact of TXA on postoperative bleeding, wound complications, and venous thromboembolism in patients undergoing first-stage revision THA for PJI.

METHODS: The Premier Healthcare Database was queried for adult patients (≥18 years) between 2016 and 2023. Using International Classification of Disease, Tenth Revision, Current Procedural Terminology codes, and hospital charge codes for antibiotics and spacers, patients undergoing stage-one revision arthroplasty for PJI following THA were identified. Patients who received TXA were identified (TXA[+]) vs. TXA[-]. Propensity score matching was used to balance cohorts. To account for residual confounding, multivariable logistic regression models were then used to assess our primary outcomes of postoperative transfusion, wound complications, deep vein thrombosis (DVT), and pulmonary embolism (PE).

RESULTS SECTION: 7,914 patients were 1:1 matched based on TXA exposure with good balance. Cohorts were similarly aged (66 vs 65 years). Within the TXA(+) cohort, 1,951 (49.71%) patients were female and 2,006 (50.69%) were male, while in the TXA(-) cohort, 1,990 (50.29%) were female and 1,967 (49.71%) were male. The average Charlson comorbidity index was similar for both cohorts (3.4 vs. 3.3). Similar rates of aspirin or low-molecular-weight heparin (79.9 vs. 78.8%) use were observed. Patients within the TXA cohort had an average TXA dose of 2.13 grams (g) ± 3.13g. TXA-treated patients had lower rates of postoperative wound complications (14.7 vs 16.8%, p=0.01; adjusted odds ratio [aOR]=0.88, 95% confidence interval [CI]=0.77-0.99). Similar rates of postoperative transfusion (15.8 vs. 14.7%, p=0.17; aOR=1.12, 95% CI=0.89-1.27), DVT (2.63 vs. 2.68%, p=0.89; aOR=0.94, 95% CI=0.71-1.25), and PE (1.0 vs. 1.0%, p=0.91; aOR=1.04, 95% CI=0.66-1.63) were observed in both cohorts.

DISCUSSION: Among patients undergoing revision THA for PJI, TXA use was associated with reduced rates of wound complications, without an increased risk of VTE. However, our findings suggest that current dosing regimens may not fully optimize TXA dosing strategies in this high-risk cohort, with potential for increased dosage administration.

SIGNIFICANCE/CLINICAL RELEVANCE: Given historically high transfusion rates for patients undergoing revision THA for PJI, tranexamic acid may serve as a useful adjunct in reducing the need for transfusion. However, its efficacy and safety profile have not been specifically described for this patient population.

IMAGES AND TABLES:

Table 1: Univariate and mixed-effects logistic regression for study outcomes between matched cohorts.

	TXA+ N=3,957		TXA- N=3,957		P-Value	Multivariable Regression			
	Number	Percent	Number	Percent		Adjusted OR (aOR)	95% CI Lower Bound	95% CI Upper Bound	P-Value
Postoperative Venous Thromboembolism	131	3.31%	135	3.41%	0.803	0.95	0.74	1.22	0.698
Postoperative Wound Complication	583	14.73%	663	16.76%	0.014	0.88	0.77	0.99	0.037
Postoperative Transfusion	624	15.77%	580	14.66%	0.168	1.12	0.98	1.27	0.091
Postoperative Bleeding Complications	1,967	49.71%	2,069	52.29%	0.022	0.89	0.81	0.98	0.015
Deep Vein Thrombosis	104	2.63%	106	2.68%	0.889	0.94	0.71	1.25	0.672
Pulmonary Embolism	40	1.01%	39	0.99%	0.91	1.04	0.66	1.63	0.876