Tranexamic Acid Is Safe in Total Joint Arthroplasty Patients with Active Cancer

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[1]Adult Reconstruction

INTRODUCTION:
While tranexamic acid (TXA) has been an effective agent for minimizing blood loss and postoperative transfusion rates following total joint arthroplasty (TJA), most studies evaluating TXA exclude patients with active cancer due to potential adverse effects. The aim of this study was to compare venous thromboembolism (VTE) rates in TJA patients receiving TXA with and without active cancer.
METHODS: A retrospective review was conducted at a single tertiary academic medical center to identify patients who underwent primary, elective total hip arthroplasty (THA) or total knee arthroplasty (TKA) between September 2017 and September 2024. Cancer diagnoses were identified using ICD-9/10 codes and manually reviewed for validity, timing, staging, and type. Patients were included if they received IV TXA during their TJA. Exclusion criteria included patients under 18 years old, those who did not receive IV TXA, and those undergoing simultaneous bilateral TJA, hemiarthroplasty, or unicompartmental knee arthroplasty. The primary outcomes were 90-day MI and VTE rates, with patients grouped by active cancer status.
RESULTS: Among 209 the (0.7%) TJA patients with active cancer and 19,174 without, all of whom received IV TXA, there were no differences in 90-day VTE, PE, or myocardial infarction rates between the groups. Active cancer patients were more likely to receive direct oral anticoagulants (23.7%vs.8.2%,P < 0.001), while aspirin monotherapy was more common in the non-cancer group (83.0%vs.61.5%,P = 0.006). No 90-day VTE events occurred in the active cancer group, while the control cohort had 95 total events. This difference was not statistically significant (P = 0.409).
DISCUSSION AND CONCLUSION: This large retrospective cohort study of active cancer patients versus non-cancer patients undergoing primary TJA with TXA showed that there were no differences in VTE, PE, or MI rates in the 90-days postoperatively. As such, TXA can safely be used in this patient population.

Tables

	Active Cancer (n=209)	No Active Cancer (n=29,174)	*P*-value
Mean Age, [SD] (range)	69.7 [10.6] (24-91)	66.0 [10.3] (18-98)	**<0.001**
Sex, n (%)			0.001
Female	106 (50.7)	18,555 (63.0)	
Male	103 (49.3)	10,819 (37.0)	
Race, n (%)			**<0.001**
White	159 (76.1)	18,567 (63.4)	
Black	33 (15.8)	4,788 (16.4)	
Asian	3 (1.4)	971 (3.3)	
Other/Unavailable	14 (6.7)	4,942 (16.9)	
Smoking Status, n (%)			**0.008**
Current	7 (3.3)	1,706 (6.1)	
Former	97 (45.5)	16,468 (51.8)	
Never	107 (31.2)	17,014 (58.1)	
ASA Score, n (%)			**<0.001**
1	1 (0.5)	1,239 (4.2)	
2	85 (40.7)	17,019 (58.2)	
3	115 (55.0)	10678 (36.5)	
4	8 (3.8)	328 (1.1)	
Mean BMI [SD] (range)	30.2 [6.3] (15-51)	31.0 [6.3] (14-74)	0.181
Mean CCI [SD] (range)	7.71 [3.9] (1-17)	3.5 [2.3] (0-20)	**<0.001**
Surgical Operation Type			**0.014**
Total Hip Arthroplasty	113 (54.1)	13,334 (45.6)	
Total Knee Arthroplasty	96 (45.9)	15,934 (54.4)	
Indication for Surgery, n (%)			0.312
Primary Osteoarthritis	192 (91.9)	924 (93.4)	
Secondary Osteoarthritis	3 (1.4)	4 (0.4)	
Fracture	6 (2.9)	31 (3.1)	
Osteonecrosis	8 (3.8)	30 (3.0)	
Anesthesia Type, n (%)			**0.044**
General	34 (16.3)	3,011 (10.3)	
Regional	175 (83.7)	26,256 (89.7)	

Table 1. Demographic composition of patients with and without active cancer at time of TJA. ASA, American Society of Anesthesiologist; BMI, Body Mass Index; CCI, Charlson Comorbidity Index. SD, Standard Deviation.

Cancer Type, n	Stage 0	Stage I	Stage II	Stage III	Stage IV	Unknown/ Not Available	Totals, n (%)
Brain	0	0	0	2	2	0	**4 (1.9)**
Breast	6	12	2	6	8	4	**38 (18.2)**
Colon	0	0	3	1	0	0	**4 (1.9)**
Endometrial	0	7	0	0	5	0	**12 (5.7)**
Female GU	0	2	0	0	2	1	**5 (2.4)**
GI	0	3	6	2	5	4	**20 (9.6)**
Head/Neck	0	0	0	0	1	3	**4 (1.9)**
Kidney	0	0	0	0	3	0	**3 (1.4)**
Leukemia	2	0	0	0	0	10	**12 (5.7)**
Liver	0	0	1	0	1	1	**3 (1.4)**
Lung	0	5	1	0	3	1	**10 (4.8)**
Lymphoma	0	3	0	0	1	3	**7 (3.3)**
Melanoma	0	0	2	0	1	0	**3 (1.4)**
Multiple Myeloma	0	0	1	0	0	1	**2 (1.0)**
Prostate	0	5	13	9	20	17	**64 (30.6)**
Skin	0	3	5	0	0	4	**12 (5.7)**
Thyroid	0	0	1	0	1	4	**6 (2.9)**
Totals, n %	**8 (3.8)**	**40 (18.1)**	**35 (16.7)**	**20 (9.6)**	**53 (25.4)**	**53 (29.4)**	**209 (100)**

Table 2. Cancer types stratified by cancer stage. GI, gastrointestinal; GU, genitourinary.

Discharge Anticoagulation Regimen Prescribed, n (%)	Active Cancer (n=135*)	No Cancer (n=17,401*)	*P*-value
Aspirin Monotherapy	83 (61.5%)	14,453 (83.0%)	**0.006**
DOAC Monotherapy	32 (23.7%)	1,433 (8.2%)	**<0.001**
P2y12-inhibitor Monotherapy	0 (0.0%)	11 (0.1%)	0.772
Heparin Monotherapy	7 (5.2%)	725 (4.2%)	**<0.001**
Aspirin + DOAC	8 (5.9%)	477 (2.7%)	0.569
Aspirin + Non-DOAC Adjunctive	3 (2.2%)	194 (1.1%)	0.227

*Number of subjects from original cohort for whom anticoagulation data was available. DOAC, dual oral anticoagulant.

Table 3. Distribution of anticoagulation regimens prescribed on discharge to patients following total joint arthroplasty.

	Active Cancer (n=209)	No Cancer (n=29,174)	*P*-value
Total 90-Day VTE Events, n (%)	0 (0.0)	95 (0.3)	0.409
Deep Vein Thrombosis	0 (0.0)	49 (0.2)	0.554
Pulmonary Embolism	0 (0.0)	46 (0.2)	0.556
90-Day Myocardial Infarction, n (%)	0 (0.0)	4 (0.01)	0.886
Operative Time in Minutes, [SD] (range)	112.5 [28.7] (63-254)	108.5 [29.4] (25-840)	0.050
Length of Stay in Hours, [SD] (range)	48.6 [44.9] (7-307)	43.8 [39.2] (4-1308)	0.080

Table 4. Clinical outcomes stratified by active cancer status.

SD, Standard Deviation. VTE, Venous Thromboembolism.