

Intravenous Tranexamic Acid Use in Breast Reconstruction: A Retrospective Study At a High-Volume Breast Center

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Background: Post-surgical blood loss increases the risk of mortality and often necessitates blood transfusion, raising healthcare costs. Tranexamic Acid (TXA), an antifibrinolytic agent, has been shown to reduce bleeding in trauma and orthopedic surgeries without significantly increasing thromboembolic risk. However, data on its safety in oncologic breast reconstruction remains limited.

Research Aim: This retrospective study evaluates the 30-day postoperative complications and outcomes of breast cancer patients undergoing autologous or implant-based breast reconstruction who have received intravenous (IV) TXA.

Methods:
Protocol: All patients in the IV TXA group received a loading dose at time of induction of 1-gram (1g) IV TXA. This was administered within 30-minutes of intubation, and was not relative to incision time. No additional IV TXA was dosed for any patients, therefore only a total of 1g of TXA was used in the perioperative period.

Data Collection: A retrospective review of 316 patients who underwent autologous or implant-based breast reconstruction was conducted. Patients were grouped based on whether they received perioperative IV TXA. Postoperative complications within 30 days were recorded, including hematoma, seroma, infection, thromboembolic events, minor complications, and reoperation.

Results: Of the 316 patients, 60 (16.7%) experienced complications. Two patients developed pulmonary embolisms—one in each group—both with significant comorbidities. Minor complications occurred in 20 (9.2%) cases, including hypotension, seizures, and wound issues. Hematomas were reported in 18 (5.7%) cases, seromas in 10 (3.2%), and infections in 19 (6.0%) (**Table 1**). Average drain duration was 17.6 days with no significant difference between groups. Binomial regression identified a prior history of blood thinner use as the only significant predictor of complications (OR = 2.49, *p* = 0.0523).

		Overall	Control (No TXA)	IV TXA Only	p-value *
Number		316	262	54	
Age	< 40	38	33	5	
	41-60	153	126	27	
	>61	125	103	22	
	Mean Age ± SD	55.37 ± 12.9	55.14 ± 13.0	56.45 ±12.1	0.4981
BMI	<18.5	3	2	1	
	18.5-25	76	67	9	
	25-30	93	81	12	
	30-40	119	93	26	
	>40	25	19	6	
	Mean BMI ± SD	30.13 ± 7.1	29.81 ± 7.0	31.58 ± 7.2	0.0981
Has Diabetes, n		47 (14.9)	35 (13.4)	12 (22.2)	0.0956
Mean A1C ± SD		7.03 ± 1.3	6.91 ±1.3	7.32 ± 1.2	0.3646
Tobacco Use, n (%)		65 (20.1)	54 (20.6)	11 (20.4)	0.9683
Blood Thinner Use, n (%)		28 (8.9)	23 (8.7)	5 (9.3)	0.0128
OCP Use, n (%)		8 (2.5)	6 (2.3)	2 (3.7)	0.5471
Preoperative Chemotherapy		92 (29.1)	80 (30.1)	12 (22.2)	
Breast Cancer Laterality	Bilateral	17	17	0	
	Left	140	120	20	
	Right	147	113	34	
	Unknown	12			

Discussion: Based on a retrospective review of patient data at a single institution, there was no significant difference in complications associated with IV TXA in the setting of oncologic breast reconstruction when compared to a similar control cohort receiving no TXA. To further investigate the role of IV TXA in decreasing the incidence of post-operative hematoma, a well-powered prospective study with a dedicated intraoperative protocol is necessary. This may prove difficult in this specific study population due to the prevalence of diversifying factors such as the use of post-operative chemotherapeutic agents, or other patient characteristics that inherently affect the coagulopathic physiology in oncologic breast reconstruction. Even so, this study provides an important steppingstone in demonstrating the relative safety of IV TXA use in the oncologic patient population.

Procedure	Implant-Based	164	152	12	
	TE-Based	33	24	9	
	Autologous Tissue Based	35	34	1	
	Oncoplastic Reduction	82	50	32	
	Other	2	2	0	
Complications	Overall, excluding minor, n (%)	60 (19.0)	47 (17.9)	13 (24.1)	0.8355
	Hematoma (%)	18 (5.7)	16 (6.1)	2 (3.7)	0.4878
	Seroma (%)	10 (3.2)	7 (2.7)	3 (5.6)	0.2703
	Infection (%)	19 (6.0)	16 (6.1)	3 (5.6)	0.8767
	Explantation (%)	6 (1.9)	5 (1.9)	1 (1.9)	0.9779
	Reoperation (%)	5 (1.5)	2 (0.7)	3 (5.5)	0.0102
	DVT (%)	0	0	0	
	PE (%)	2 (0.6)	1 (0.4)	1 (1.9)	0.2148
	Other Minor (%)	29 (9.2)	24 (9.2)	5 (9.3)	0.9817
	Mean Total Drain Time ± SD	17.60 ± 10.2	17.59 ± 10.1	17.63 ± 10.8	0.9872

*p-values are from t-testing between the control and test groups.

Table 1. Demographics of breast cancer patients in the dataset including age, BMI, and location of breast cancer. Distribution of the types of breast reconstruction and any resulting complications were also quantified. Other procedures include oncoplastic reduction, flat mastectomy closure, and revision mastopexy. Overall complications are reported per patient rather than per complication. P-Values are calculated using two-sided t testing or Pearson’s test of independence.