Tranexamic Acid increases the Risk of Thrombotic Complications following Sarcoma Resection

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INTRODUCTION:

Tranexamic acid (TXA) is an antifibrinolytic drug that has been shown to reduce blood loss and the need for transfusion following surgery. Over the past several years, the use of TXA during orthopedic procedures has gained widespread acceptance, with multiple clinical studies demonstrating no increase in thrombotic complications.

While TXA has been shown to be safe and effective for orthopedic procedures, its use in sarcoma surgery is less established. Cancer-associated thrombosis is a major cause of morbidity and mortality in sarcoma patients. It is unknown if intraoperative TXA use will increase the risk of developing a thrombotic complication in this population.

This study aimed to compare the risk of postoperative thrombotic complications in patients who received TXA during sarcoma resection to patients who did not receive TXA. We hypothesized that sarcoma patients who received TXA during surgery would not have an increased risk of perioperative thrombotic complications.

METHODS:

After obtaining institutional review board approval, we retrospectively reviewed the medical records of 1,104 patients who underwent resection of a soft tissue or bone sarcoma at our institution between 2010 – 2021. Demographic data, tumoral and operative characteristics, venous prophylaxis regimen, and postoperative complications were reviewed. Postoperative complications included: wound complications, deep venous thrombosis (DVT), pulmonary embolism (PE), myocardial infarction (MI), cerebrovascular accident (CVA), and 90-day mortality.

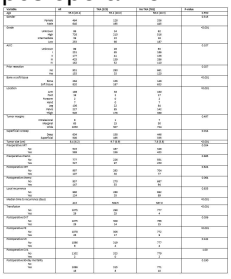
RESULTS:

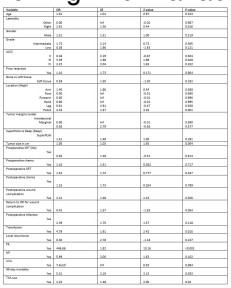
TXA was used more commonly for bone tumors, tumors located in the pelvis, and larger tumors. Patients who received TXA during surgery were associated with a statistically significant increase in developing a postoperative DVT (P = 0.036) and PE (P < 0.001) but had no associated increase in CVA (P = 1.00) or 90-day mortality (P = 0.19) (**Table I**).

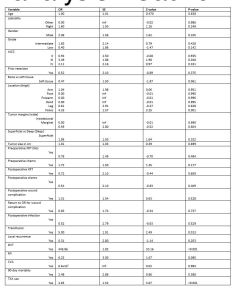
Univariate predictors of DVT and PE are listed in **Tables II** and **III**, respectively. Multivariable analysis demonstrated that a larger tumor size (OR 1.11, P = 0.005) and a diagnosis of a PE (OR 729, P < 0.001) were independently associated with the development of a postoperative DVT (**Table IV**). A postoperative DVT (OR 765.10, P < 0.001) and TXA use (OR 10.68, P = 0.003) were independently associated with the development of a postoperative PE (**Table V**).

DISCUSSION AND CONCLUSION:

While this study has several unavoidable limitations, the results demonstrate a higher risk of thrombotic complications, including DVT and PE, following TXA use in sarcoma surgery. TXA was independently associated with a risk of postoperative PE following multivariable analysis. Caution is warranted with TXA use in this patient population.







Variable	OR	SE	Z-value	P-value
Tumor Size	1.11	1.04	2.82	0.005
PE	729.08	2.07	9.04	<0.001

Variable	OR	SE	Z-value	P-value
DVT	765.10	2.24	8.26	<0.001
TXA use	10.68	2.22	2.97	0.003