

Intravenous Tranexamic Acid Decreases Transfusion Requirements And Does Not Increase Incidence Of Thromboembolic Events In Sarcoma Surgery

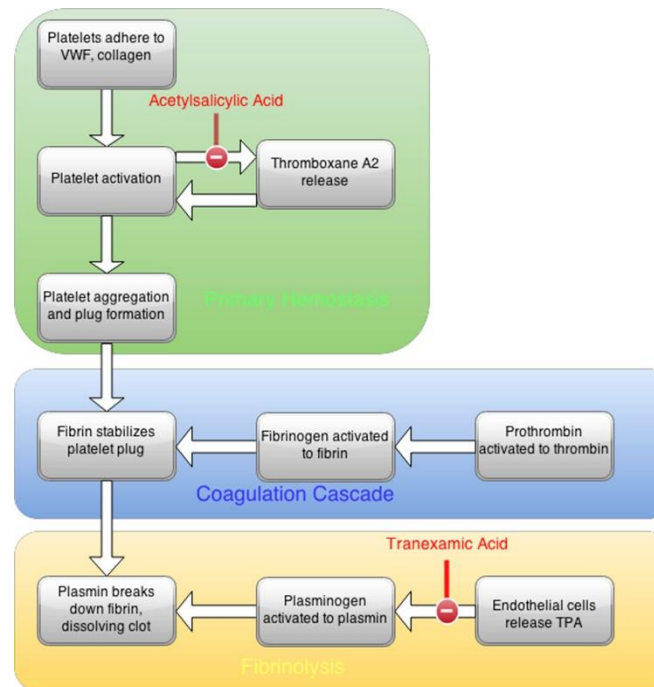
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Background:

- ▶ Tranexamic acid (TXA) is a commonly used antifibrinolytic medication that stabilizes clots and has been shown in numerous studies of various orthopedic surgeries, including total hip and knee arthroplasty, to safely reduce intraoperative blood loss and transfusion requirements. Sarcoma resections are associated with high blood loss, but there has been some reservation in using TXA in patients with a cancer diagnosis due to the potential increased risk of thromboembolic events. A recent study shows no increased thromboembolic events and decreased blood loss and transfusion rates with topical TXA in oncologic patients undergoing endoprosthetic reconstruction. Few studies have assessed the safety and efficacy of intravenous (IV) TXA in oncologic patients.

Questions/Purpose:

- 1) Is IV TXA safe to use in patients with a diagnosis of primary sarcoma requiring resection in terms of risk of thromboembolic events?
- 2) Does IV TXA reduce intraoperative blood loss and transfusion requirements as well as postoperative transfusion requirements in patients undergoing sarcoma resection?



▶ Patient and Methods:

We retrospectively reviewed patients who underwent sarcoma resection with or without reconstruction by a single surgeon. Starting in 2012, the corresponding author began using one gram IV TXA within 30 minutes of the time of initial incision for all soft tissue and bone sarcoma wide resections anticipated to exceed 200cc blood loss. For some cases, a second gram of TXA was given at the time of closure at the discretion of the treating surgeon. We analyzed all patients with a primary sarcoma diagnosis who underwent surgical resection from 2006-2011 and compared to those from 2012-2019 who received IV TXA. Two-sample *t*-test was used to compare mean estimated blood loss and average volume of intra- and post-operative blood transfusions between the TXA and non-TXA groups. Chi squared analysis was used to compare the incidence of deep venous thrombosis (DVT) or pulmonary embolism (PE) between groups. DVT and PE incidence were measured as any positive lower extremity ultrasound or CT angiogram recorded within 90 days post-surgery, respectively.

▶ Results:

After excluding patients with metastatic disease and benign soft tissue or bone tumors undergoing resection, we analyzed 49 patients undergoing sarcoma resection who received IV TXA and 45 patients who did not. The two groups did not differ significantly with regards to age, gender, BMI, American Society of Anesthesiologists (ASA) physical status classification system scores, distribution of sarcoma type, anatomic location, or addition of endoprosthetic reconstruction or not. In the TXA group, there were 0 post-operative venous thromboembolic events (VTE) and in the non-TXA group there were 2 (4.55%). There was a significant decrease in average estimated blood loss by 363cc ($p=0.04$) and intraoperative transfusion volume of 352cc ($p=0.007$) in the TXA compared to the non-TXA group. On average there was a 177cc decrease in postoperative blood transfusion requirements in the TXA compared to the non-TXA group, however this was not statistically significant ($p=0.05$).

▶ Conclusions:

As in other areas of orthopedic surgery, TXA is effective at decreasing intraoperative blood loss and transfusion requirements in orthopedic oncology patients without exposing patients to additional VTE risk. This study provides early evidence to support the safety and efficacy of IV TXA in this patient population.