Does Tranexamic Acid Reduce Intraoperative Blood Loss, Intraoperative Transfusion Rate, or Postoperative Transfusion Rate in Acetabular Fracture Surgery?

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Purpose: Tranexamic acid (TXA) is being widely used in total joint arthroplasty and has been shown to decrease blood loss and transfusion rate without increased risk of thromboembolic events. As a result of the findings in total joint arthroplasty, we started using TXA during pelvic and acetabular fracture surgery. Our hypothesis is that administration of intravenous TXA will reduce intraoperative blood loss, intraoperative transfused units, and postoperative transfused units of blood in acetabular fracture surgery without an increase in deep vein thrombosis (DVT) or thromboembolic events.

Methods: We did a retrospective review of patients under the care of a single orthopaedic traumatologist from 2010-2015. We reviewed a cohort of patients who received TXA and compared them to a matched cohort that did not. Data were collected on intraoperative blood loss, and units of blood product administered preoperative, intraoperative, and postoperative. In addition, administration of blood from cell saver was also recorded when used. We recorded preoperative/postoperative hematocrit. The approach used for surgery and the length of surgery were recorded, and the amount of blood loss per minute of surgery was calculated. It was important to calculate the rate of blood loss per minute of surgery because longer surgery increases blood loss. And finally we collected data on thromboembolic events such as DVT, pulmonary embolism (PE), and stroke. When we had parametric data a *t* test was used and when it was nonparametric we used a Wilcoxon score, which is based on median.

Results: We separated the patients into two groups based on the approach used at the time of surgery. Those patients were then split into a group that did and did not receive TXA. When comparing the group of patients that underwent a Kocher approach (no TXA n = 34, TXA n=19) there was no statistically significant difference using *t* test in intraoperative blood loss ($P = 0.47$), rate blood loss per min/surgery ($P = 0.71$), or length of surgery ($P = 0.81$). We did not have enough patients require cell saver, blood transfusion either intraoperative or postoperative to calculate significance. When looking at patients who had an anterior approach to the acetabulum there were 18 patients who did not receive TXA and 14 that did receive TXA. There was no statistically significant difference in the amount of cell saver transfused ($P = 0.32$) or length of surgery ($P = 0.52$). Intraoperative blood loss ($P = 0.13$) started to approach statistical significance. Rate of blood loss per min/surgery ($P = 0.02$) and intraoperative blood transfusion rate ($P = 0.05$) were statistically significant. We did not have enough patients receive a postoperative blood transfusion to calculate significance. There were no thromboembolic complications such as DVT, PE, or stroke in patients who underwent a Kocher approach. There were 2 patients who developed a DVT and 1 who

Anterior Approach to Acetabulum

Variable	GROUP = TXA (N=12)	GROUP = no TXA (N=18)	P-Value
Cell Saver (ml) (Mean ± SD (N))	280.3 ± 145.4 (N=12)	448.6 ± 529.7 (N=18)	0.20°
Intraoperative blood loss (Mean ± SD (N))	900.0 ± 400.6 (N=12)	1347.2 ± 937.1 (N=18)	0.08°
Intraoperative blood transfusion (Mean ± SD (N))	1.1 ± 1.2 (N=12)	2.3 ± 2.2(N=18)	0.06°
Length of Surgery (min) (Mean ± SD (N))	280.3 ± 82.0 (N=12)	249.8 ± 101.9 (N=18)	0.37°
Postoperative blood transfusion (Mean ± SD (N))	0.2 ± 0.6 (N=12)	0.3 ± 0.7 (N=18)	0.63°
Rate blood loss per min/sx (Mean ± SD (N))	3.3 ± 1.6 (N=12)	5.4 ± 1.5 (N=18)	0.02°

Kocher Approach to Acetabulum

Variable	GROUP = TXA (N=21)	GROUP = no TXA (N=35)	P-Value
Cell Saver (ml) (Mean ± SD (N))	49.3 ± 140.3 (N=21)	67.9 ± 156.5 (N=35)	0.66°
Intraoperative blood loss (Mean ± SD (N))	533.3 ± 308.0 (N=21)	554.3 ± 460.9 (N=35)	0.85°
Intraoperative blood transfusion (Mean ± SD (N))	0.4 ± 0.7 (N=21)	0.6 ± 1.0 (N=35)	0.47°
Length of Surgery (min) (Mean ± SD (N))	213.3 ± 104.6 (N=21)	194.3 ± 61.7 (N=35)	0.39°
Postoperative blood transfusion (Mean ± SD (N))	0.1 ± 0.4 (N=21)	0.5 ± 1.1 (N=35)	0.15°
Rate blood loss per min/sx (Mean ± SD (N))	2.6 ± 1.1 (N=21)	2.7 ± 1.6 (N=35)	0.81°

developed a PE who underwent an anterior approach but did not receive TXA. There was 1 patient who received TXA and underwent an anterior approach who developed a DVT.

Conclusion: At this time it does not appear that the use of TXA decreases the rate of blood loss during acetabular surgery with the use of a Kocher approach. However, when using an anterior approach to the acetabulum there was a statistically significant decrease rate of blood loss per minute of surgery and intraoperative blood transfusion. There was a trend toward decreased intraoperative blood loss. There was no statistically significant increase in rate of thromboembolic events in patients who received TXA compared to those who did not. As a result, it appears to be safe to use TXA during acetabular fracture surgery. At this time, we recommend the use of TXA in patients undergoing an anterior approach to the acetabulum for fracture surgery. It does not appear to be beneficial to use TXA during the Kocher approach for acetabular surgery.

See pages 49 - 106 for financial disclosure information.