

# The Potential of Tranexamic Acid Use for Wide Awake Local Anesthesia No Tourniquet

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**Summary:** Tranexamic acid (TXA) is a drug commonly used to decrease intraoperative bleeding. Its use in various types of surgery is well defined; however, its use in plastic surgery and even more so, hand surgery is not as well researched. Concurrently, the use of wide-awake local anesthesia no tourniquet (WALANT) procedures has increased in popularity. As the use of WALANT increases, it comes to question whether TXA could be used as an alternative to epinephrine during WALANT procedures. This case involves a 33-year-old woman status-post motor vehicle collision. On examination, the patient sustained transection of the flexor digitorum profundus on both her left middle and ring fingers along with absent sensation to her left middle finger. Due to the surgical preference for vascular monitoring, TXA was used alternatively to epinephrine to control intraoperative bleeding during the tendon repairs. It was observed that TXA allowed for controlled bleeding, preservation of the surgical visual field, successful tendon repair, and postoperative success. The successful use of TXA in this case prompts further investigation as to whether TXA could be used as an alternative to epinephrine in WALANT procedures. (*Plast Reconstr Surg Glob Open* 2022;10:e4630; doi: [10.1097/GOX.0000000000004630](https://doi.org/10.1097/GOX.0000000000004630); Published online 27 October 2022.)

**T**ranexamic acid (TXA) is an antifibrinolytic drug commonly used for hemostasis. It acts via competitive inhibition of the lysine receptor on plasminogen, preventing the formation of plasmin that allows for the stabilization of fibrin.<sup>1,2</sup> Although its use is indicated for heavy menstrual bleeding and for the treatment of hemophilia,<sup>3</sup> it is a commonly used drug during surgical operations to reduce perioperative blood loss. TXA has been commonly used in various surgical fields, such as orthopedics, trauma, and obstetrics.<sup>4</sup> While the use of TXA is prominent in other fields, its use in plastic surgery is limited, aside from its prominence in craniofacial procedures. In a review conducted by Rohrich and Cho<sup>5</sup> in 2018, it was demonstrated that TXA can potentially allow for decreased bleeding and positive postsurgical outcomes in plastic surgical procedures and that local use of TXA can allow for adequate hemostatic control comparable to intravenous use.<sup>6</sup> Although there is some evidence

regarding the use of TXA as a hemostatic agent in plastic surgery, its use in hand surgery has not widely been described.

Concurrently, in terms of hand surgery, there is an increased performance of wide-awake local anesthesia no tourniquet (WALANT) procedures. It has been studied that the use of WALANT procedures has allowed for an increase in positive surgical outcomes as well as an increase in patient satisfaction.<sup>7,8</sup> Generally, WALANT is performed with significant use of epinephrine. This has been shown to be safe; however, in situations such as this one, surgical preference for vascular monitoring may be preferred. This case study describes a case in which TXA was used instead of epinephrine for WALANT in this very situation.

This case involves a 33-year-old woman status-post motor vehicle accident. On her middle finger, she sustained flexor digitorum profundus transection with no sensation at all. On the ring finger, she had flexor digitorum profundus transection with lack of sensation on the radial half of the finger. On pulse oximetry, her left ring and middle fingers reached an oxygen saturation of 95%.

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Similarly, the capillary refill of both the left middle and ring fingers remained normal with bleeding to pinprick.

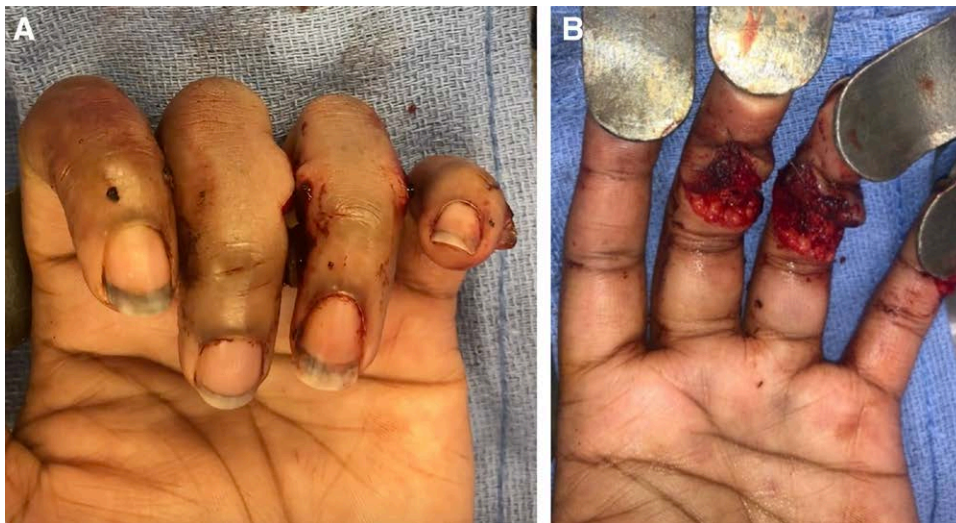
Given the lack of sensation on the middle finger, there was concern that both digital arteries were also transected and perfusion to the finger was through the large skin bridge. Therefore, vascular monitoring was surgically preferred, and epinephrine was not used. No tourniquet and local anesthesia was still desired to test the tendon repair. First, 500 mg of TXA was supplied subcutaneously, and once Brunner flaps were elevated, a 4×4 gauze soaked in 1 g of TXA was topically applied. TXA effectively allowed for adequate visualization of the surgical field by decreasing bleeding.

At the end of the procedure, range of motion of the digits of the left hand was observed, and there was no gapping of the tendon repair (Fig. 1A,B). (See Video [online], which shows the intraoperative wide awake exam

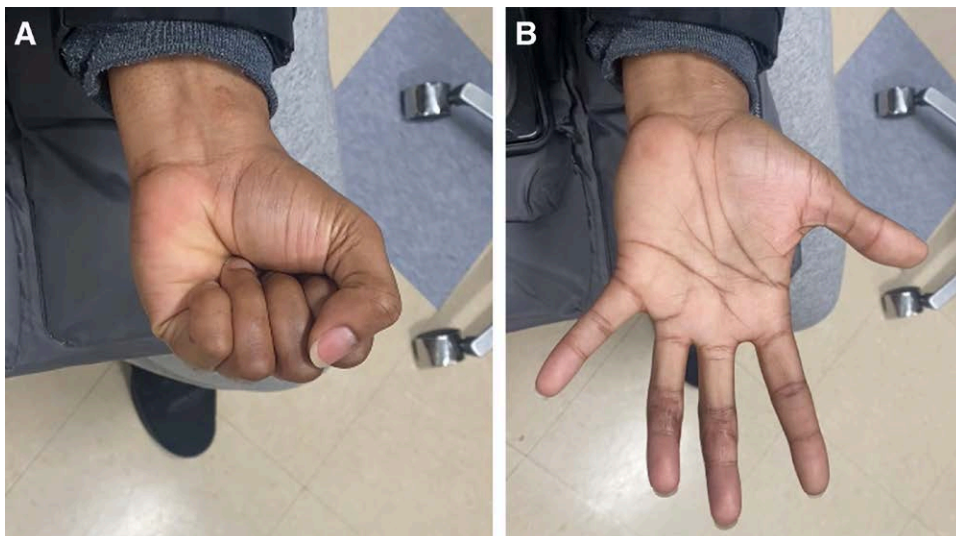
after tendon and nerve repair using TXA rather than epinephrine for WALANT. Nine month postoperative range of motion is also shown.) Blood loss was estimated to be 5 cm<sup>3</sup>.

The patient did have delayed wound healing of the Brunner flaps that healed by secondary intention. At 9 months postoperatively, the patient had full flexion and extension of the distal interphalangeal (DIP) and proximal interphalangeal (PIP) joints in her left hand with well-healed surgical wounds (Fig. 2A,B). (See Video [online].)

In this case, the use of TXA allowed for adequate visualization of the surgical field and for excellent patient recovery with the regaining of proper motor function. Although TXA allowed for a successful surgical outcome in this case, it is necessary to understand its current use in the literature as well as its adverse effects. In a review conducted by Aussen et al<sup>6</sup> in 2022, it was determined that



**Fig. 1.** This patient had injury of both digital neurovascular bundles on the middle and ring fingers along with the flexor tendon. TXA was utilized to allow for WALANT so the tendon repairs could be tested. Visualization of the range of motion of the digits of the left hand intraoperatively including flexion (A) and extension (B).



**Fig. 2.** This is the patient from Figure 1 postoperatively showing good motion after surgery. Visualization of the range of motion of the left hand 9 months postoperatively including (A) and extension (B).

the use of topical TXA in surgical procedures, such as mammoplasty, mastectomy, and adenoidectomy, allowed for significant reductions in surgical bleeding. However, it is stated that there is no current superior dosage or means of administration when using TXA for surgical patients.<sup>6</sup> Similarly, in a review conducted by Elena<sup>9</sup> in 2021, it was determined that the use of TXA is beneficial in reducing intraoperative and postoperative blood loss and that TXA was effective when used both topically and systemically. Alternatively, it has been observed that the use of TXA has been linked to seizure development<sup>9</sup> and that contact with the central nervous system should be avoided.<sup>6</sup> In regard to the dosage of TXA, there are currently not enough data in published literature to support a correct dosage of the drug for use. Determining the correct dose for optimal drug success would be a topic for future studies. The success of TXA use in this case prompts further investigation into its use as a hemostatic agent in plastic surgery and, more specifically, as an alternative to epinephrine in WALANT procedures where vascular monitoring of the digit is preferred.

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