

# Achieving the Optimal Epinephrine Effect in Wide Awake Hand Surgery Using Local Anesthesia Without a Tourniquet



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## Introduction

- ▶ The majority of hand procedures can be performed with excellent hemostasis using wide awake local anesthesia & no tourniquet (WALANT) surgery <sup>1</sup>.
- ▶ The optimal epinephrine effect is achieved by waiting significantly longer than the traditionally quoted 7 minutes for maximal vasoconstriction, after lidocaine + epinephrine injection <sup>2</sup>.

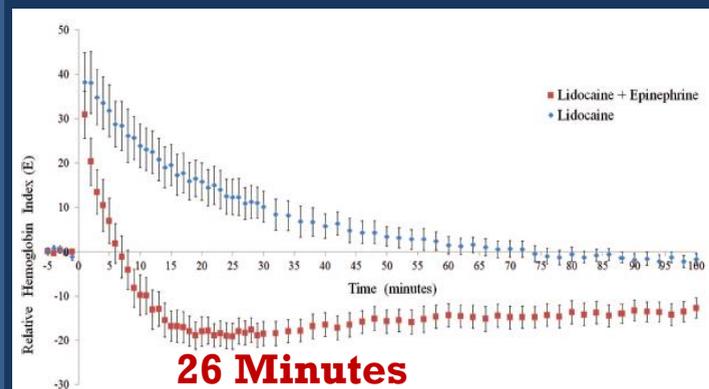


Fig. 1. Mean relative hemoglobin index (unitless) (y axis) versus time (in minutes) (x axis). Time = 0 is the injection of plain lidocaine (blue) and lidocaine plus epinephrine (red). Time < 0 represents baseline measurements. Error bars = SEM. The lowest point on the lidocaine plus epinephrine curve was -19.1, occurring at 25 minutes.

## Methodology

- ▶ Prospective
- ▶ 15 standardized skin incisions over the carpal tunnel
- ▶ 8cc injection of 1% Lidocaine +1:100,000 epinephrine
- ▶ Comparative study: Time delay before incision 7 vs. ~30 minutes
- ▶ Blood loss measured using sterile micropipettes



## Results

Mean Blood loss (ml/cm incision):

**7 Minutes between injection and incision:**

0.17 ± 0.08 ml/cm (95% C.I.)

**30 minutes between injection and incision:**

0.06 ± 0.03 ml/cm (95% C.I.)

Means were found to be statistically significant using a student T test (P=0.03)

## Discussions

- ▶ This is the first study to measure micro quantities of intraoperative bleeding to assess the effects of local anesthetic and epinephrine on vasoconstriction.
- ▶ We measured a near 3-fold reduction in the quantity of bleeding in carpal tunnel incisions when we waited 30 minutes instead of 7 minutes between injection of lidocaine/epinephrine and the incision..
- ▶ This study adds level II evidence to previous level I evidence<sup>2</sup> that waiting 30 minutes provides better hemostasis than waiting 7 minutes. Ideally, patients should be injected before they come into the operating room to provide better tourniquet free hemostasis with WALANT surgery<sup>3 4</sup>.

## References

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- 2) Mckee D, Lalonde D, Thoma A, Glennie D, Hayward J. Optimal time delay between epinephrine injection and incision to minimize bleeding. Plast Reconstr Surg. 2013;131:811-814.
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- 4) Lalonde D, Martin A. Tumescent local anesthesia for hand surgery: improved results, cost, effectiveness, and wide-awake patient satisfaction. Arch Plast Surg. 2014;41:312-316.