Minimize Bleeding With Time Delay Between Epinephrine Injection And Incision

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Purpose:
The purpose of this study was to see how much time it takes to obtain the lowest cutaneous hemoglobin concentration after lidocaine with epinephrine injection. This will give us a better idea of how long is the ideal waiting time between epinephrine injection and incision in the skin to minimize bleeding.

Methods:
This was a prospective randomized triple-blinded study (level I evidence) where 12 volunteers were injected simultaneously in each arm with either 1% lidocaine with epinephrine (study group) or 1% lidocaine plain (control group) and the underlying skin and soft tissue’s relative hemoglobin concentration was measured over time using spectroscopy. Tissue reflectance spectroscopy is a validated reproducible technique for measuring total hemoglobin concentrations in soft tissue.

Results:
In the epinephrine group, the mean time where lowest cutaneous hemoglobin was obtained was 25.9 minutes with a 95% confidence interval of 25.9 ± 5.1. This was significantly longer than the historical literature values of 7 to 10 minutes for maximum vasoconstriction after injection. Mean relative hemoglobin index values at every time measurement after 1 minute post injection were significantly different between the lidocaine + epinephrine group and the lidocaine group, using a two-tail paired t-test (p<0.01) (figure 1).

![Figure 1: Mean relative hemoglobin Index (unitless) [y-axis] vs. time (minutes)[x-axis]. Time = 0 is the injection of lidocaine plain (blue) and lidocaine + epinephrine (red).](image)

Conclusions:
Waiting 25 minutes after injection of local anesthetic with epinephrine before making a skin incision will result in less intraoperative bleeding than waiting only 7-10 minutes. Plastic surgeons already utilizing this...
concept may inject local anesthetic, leave the injected patient temporarily to perform another task on a different patient, and later return after roughly 25 minutes to begin the procedure on the first patient.

References:
