

A One-Step Catheter Over Needle System Compared to a Single Shot Nerve Block for Shoulder Surgery

Aaron Smoroda, MS4

Mentor: Nathan Clendenen, MD, MS

Jacob Loyd, MD, †* Aaron Smoroda, BS*, † Nathan Clendenen, MD, MS, † John Armstrong, MD, † Adrian Hendrickse, BM FRCA, † Matthew Lyman, MD, †, Kyle Marshall, MD, † Roland Flores, MD, † Adit Ginde, MD, MPH, † Olivia Romano, MD †

ABSTRACT

Background and objectives

Catheters for peripheral nerve blockade can offer advantages over a single shot technique such as prolonged analgesia, but placing catheters may require additional time which can limit routine implementation before surgery. A one-step catheter over needle system potentially reduces catheter placement procedural time and therefore could expand access to continuous peripheral nerve blockade.

Methods

We performed a study of 40 sequential patients receiving a single shot peripheral nerve block for elective shoulder surgery with either a one-step catheter over needle system (n = 20) or a traditional single shot block needle (n = 20). The primary outcome of the study was the total procedure time. Secondary outcomes included the incidence of complications and the effect of learning.

Results

We observed a statistically significant, but clinically insignificant, increase in procedure time with the catheter group compared to the single shot block needle group (2.1 minutes versus 1.4 minutes, $p = <0.001$). Using a linear mixed model, we noted a significant association between block type and placement time, which was increased in the catheter group by 35 seconds, 95% CI [15 – 56]. We did not observe a significant learning effect when controlling for procedure sequence. All the blocks provided adequate analgesia and there were no complications associated with peripheral nerve blockade in either group.

Conclusions

A one-step catheter over needle system results in a statistically significant increase in nerve block procedure time, which is unlikely to be clinically consequential, compared to a nerve block using a traditional single shot block needle.