

Ultrasound guidance and success rates of axillary brachial plexus block - II

To the Editor:

We read with great interest Chan *et al.*'s¹ study comparing ultrasound with nerve stimulation for axillary plexus block. Despite increased use of ultrasound in regional anesthesia, randomized trials comparing this approach with modern nerve stimulation techniques are relatively few.² However, in our opinion this study missed an opportunity to fully investigate the role of ultrasound for axillary block.

Unfortunately, ultrasound in Chan *et al.*'s¹ study did not utilize current nerve stimulation modalities for axillary block.³⁻⁵ The authors reported a success rate of 62.9% for median, ulnar and radial sensory block, which is relatively low compared with currently published data (> 92% success rates) and our clinical experience.⁶ Despite this discrepancy, the authors conclude that ultrasound "significantly improves the success rate." We also note a slight error in Table II for "Successful surgical anesthesia without supplementation".¹ For the ultrasound group, we believe the reported percentage should have been 92.2% rather than 95% (59 of 64, not 62 patients). This changes the *P* value (but not overall significance) from 0.07 to 0.26.

Studies demonstrating success rates of 91-97% have accepted a distal response as the only endpoint for radial nerve stimulation. Coventry *et al.*³ performed triple stimulation axillary block (25 mL lidocaine 1.5% with epinephrine), reporting 100% sensory blockade of median, ulnar and radial nerves to pinprick at 30 min. Sia *et al.*⁴ performed triple stimulation axillary block (36 mL lidocaine 2% and bupivacaine 0.5%). He reported success rates of 93% for median and ulnar sensory block (cold at 30 min) and 95% for the radial nerve. Chan *et al.*¹ accepted triceps rather than distal responses as an appropriate endpoint in 85% of patients despite Sia⁵ demonstrating a significant difference in sensory radial nerve blockade when comparing a proximal (triceps) with a distal (wrist/fingers) endpoint (81% vs 95%). The accompanying editorial alluded to the low success rate, but the findings were explained by "rigid definitive endpoints of complete pinprick", and despite stating that the proximal response "may have been detrimental", concluded "clearly, ultrasound visibility of the nerve will enhance success".²

If we are to use ultrasound guidance for axillary block in everyday practice, we must first compare the technique with the presently-accepted standard

of seeking distal radial responses in triple stimulation axillary blocks.

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Reply:

We sincerely thank Drs. Mannion and Capdevila and also Drs. Aguirre, Blumenthal and Borgeat for their interest in our article,¹ and take this opportunity to clarify some of the issues which they raised.

The major concern is related to the apparently low success rate of axillary block associated with triple endpoint nerve stimulation (62.9% in group NS) as compared to 80.7% and 82.8% with ultrasound + nerve stimulation (group USNS) and ultrasound alone (group US), respectively.¹ As stated in the manuscript, our definition of block success was complete sensory anesthesia to pinprick in all three target nerves (radial, ulnar and median) at 30 min. This strict definition is more rigorous than commonly-used endpoints e.g., successful surgical anesthesia or loss of cold sensation.

As stated by Aguirre *et al.*, Stan² reported "successful surgical anesthesia" in 88.8% of patients receiving trans-arterial axillary blocks. When this definition is