

Commentary

Ultrasound-guided truncal/ plane blocks: Are they safe in anticoagulated patients?

Ultrasound (US) has gained great popularity in the recent times. Its avenues have grown from a radiological diagnostic modality to an interventional one embraced by surgeons, anesthesiologists, critical care and emergency physicians alike. A wide variety of nerve and plexus blocks are being administered under US guidance. With gain of expertise, many new fascial plane blocks like transversus abdominis, rectus sheath, quadratus lumborum, serratus plane block, PECS block, retrolaminar and erector spinae plane block (ESPB) have been introduced. Fascial plane blocks are technically easier to perform under US guidance.

In this issue Arun, *et al.* report the case of a 52-year old female on anticoagulant and antiplatelet therapy with deranged prothrombin time and international normalized ratio who received bilateral US-guided ESPB for postoperative pain after extended cholecystectomy for carcinoma gall bladder. Catheter for continuous local anesthetic infusion for 48 h

was also inserted and there were no reported perioperative complications.^[1] I congratulate them for the successful management of this patient.

The case management raises some very pertinent questions. What is the incidence of vascular injuries/hematoma formation after administration of US-guided blocks? Do we have sufficient data on safety of US-guided blocks to support their use in patients on anticoagulant therapy? Are there any international guidelines regarding the same? This commentary focuses on searching for evidence to answer these queries.

Clinical trials on anticoagulated patients receiving peripheral or plexus nerve blocks are lacking but cases of bleeding complications after deep and superficial nerve blocks and peripheral nerve catheters have been reported.^[2,3] The exact figures on the frequency of complications are not available. There is an undefined risk of developing a hematoma and hence peripheral nerve blocks into deep and non-compressible sites are fraught with risks. Enough evidence is available to support that in patients on anticoagulant therapy, morbidity due to hematoma formation is more frequent and serious than neurological complications. For deep plexus or deep peripheral blocks in patients on anticoagulation and antithrombotic

medication, American Society of Regional Anesthesia and Pain Medicine (ASRA) guidelines recommend that similar precautions as applicable for neuraxial blocks should be followed. A new recommendation in the latest ASRA guidelines states "...the decision regarding performance of the block, catheter insertion and maintenance should be based upon the site compressibility, vascularity and consequences of bleeding."^[4]

The utility and safety of US over traditional techniques for administering truncal blocks is also not substantiated with enough randomized controlled trials. Ultrasound guidance may increase the success rate of these blocks and is expected to reduce intraperitoneal needle placement or hollow viscous injury but there is no level I/II evidence to prove this.^[5] As per the American Institute of Ultrasound in Medicine, the risk of developing complications under US guidance cannot be eliminated.^[6] In fact, the complication rates are similar to those reported using traditional nerve localization tools. Proficiency of the operator performing the US-guided block is a big determining factor for the success of the block and number and seriousness of complications. Advancement of needle without visualizing its tip has been stated as one of the most common errors during US-guided blocks which may end up in intravascular/intraneural placement.^[7] US alone using the grey scale may be incapable of identifying, and thus avoiding injury to, vascular structures. According to the results of a simulation training study on US-guided hip joint injection, it was found that the incidence of accidental arterial puncture may be as high as 22% with the use of US guidance alone. Hence to prevent vascular injury, the authors advised incorporation of Doppler imaging in addition to US to identify vessels during needling in high risk patients especially those with bleeding tendency or on anticoagulant therapy.^[8]

Let us now have a look at the anatomy, the technique and safety concerns with ESPB, the block in question, in patients on anticoagulant therapy. The ESPB is a relatively recent block first described in 2016. Its clinical applications and indications are still under investigation. Pneumothorax has been stated as one of the major complications but it is expected that more side effects and complications will be revealed once the block is used widely in clinical practice.^[9,10] A pooled review of 242 cases of ESPB states that it is a superficial block and so the risk of dural puncture and hematoma along the spinal cord is low.^[11] Adhikary *et al.* have reported a series of five patients who underwent thoracotomy for placement of left ventricular assist device. They administered ESPB and placed catheter for post-thoracotomy pain relief in these patients and did not encounter any complication related to the block or

catheter placement.^[12] The site of ESPB administration is deep in the erector spinae muscle and superficial to the tips of the thoracic transverse processes, distant from the pleura and major blood vessels.

In the absence of safety trials on a large number of patients, it is prudent to avoid these blocks in anticoagulated patients. If at all they are performed under US guidance, needling should be done by an expert with careful needle tip visualization. Doppler imaging should be incorporated to improve the safety profile. Indwelling catheters should not be inserted routinely. The ASRA guidelines regarding the timing of block administration and removal of catheter with respect to the anticoagulant dose timings should be adhered to. Patients should be watched closely for the complications and instant interventions should be undertaken if there is a suspicion of hematoma formation.

Rashmi Salhotra

Department of Anaesthesiology, University College of Medical Sciences and Guru Teg Bahadur Hospital, Dilshad Garden, Delhi, India

Address for correspondence: Dr. Rashmi Salhotra,
A-2/268, Second Floor, Paschim Vihar, New Delhi - 110 063, India.
E-mail: rashmichabra@yahoo.com


References

1. Arun N, Singh S. Is ESP block an answer for upper abdominal surgeries where epidural analgesia can't be used? *J Anaesthesiol Clin Pharmacol* 2020;36:117-8.
2. Klein SM, D'Ercole F, Greengrass RA, Warner DS. Enoxaparin associated with psoas hematoma and lumbar plexopathy after lumbar plexus block. *Anesthesiology* 1997;87:1576-9.
3. Welle RS, Gerancher JC, Crews JC, Wade KL. Extensive retroperitoneal hematoma without neurologic deficit in two patients who underwent lumbar plexus block and were later anticoagulated. *Anesthesiology* 2003;98:581-5.
4. Horlocker TT, Vandermeulen E, Kopp SL, Gogarten W, Leffert LR, Benzon HT. Regional anesthesia in the patient receiving antithrombotic or thrombolytic therapy. American society of regional anesthesia and pain medicine evidence-based guidelines (Fourth edition). *Reg Anesth Pain Med* 2018;43:263-309.
5. Neal JM, Brull R, Chan VW, Grant SA, Horn JL, Liu SS, *et al.* The ASRA evidence-based medicine assessment of ultrasound-guided regional anesthesia and pain medicine. Executive summary. *Reg Anesth Pain Med* 2010;35:S1-9.
6. AIUM Practice Parameter for the use of ultrasound to guide vascular access procedures. *J Ultrasound Med* 2019;38:E4-18.
7. Sites BD, Spence BC, Gallagher JD, Wiley CW, Bertrand ML, Blike GT. Characterizing novice behavior associated with learning ultrasound-guided peripheral regional anesthesia. *Reg Anesth Pain Med* 2007;32:107-15.
8. Zhang M, Pessina MA, Higgs JB, Kissin EY. A vascular obstacle in ultrasound-guided hip joint injection. *J Med Ultrasound* 2018;26:77-80.
9. Missair A, Flavin K, Paula F, Benedetti de Marrero E, Benitez Lopez J, Matadial C. Leaning Tower of Pisa? Avoiding a major neurologic

complication with the erector spinae plane block. *Reg Anesth Pain Med* 2019;44:1713-4.

10. El-Boghdadly K, Pawa A. The erector spinae plane block: Plane and simple. *Anaesthesia* 2017;72:434-8.
11. Tsui BC, Fonseca A, Munshey F, McFadyen G, Caruso TJ. The erector spinae plane (ESP) block: A pooled review of 242 cases. *J Clin Anesth* 2019;53:29-34.
12. Adhikary SD, Prasad A, Soleimani B, Chin KJ. Continuous erector spinae plane block as an effective analgesic option in anticoagulated patients after left ventricular assist device implantation: A case series. *J Cardiothorac Vasc Anesth* 2019;33:1063-7.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online	
Quick Response Code:	Website: www.joacp.org
	DOI: 10.4103/joacp.JOACP_306_19

How to cite this article: Salhotra R. Ultrasound-guided truncal/plane blocks: Are they safe in anticoagulated patients? *J Anaesthesiol Clin Pharmacol* 2020;36:118-20.

Submitted: 15-Sep-2019 **Accepted:** 15-Sep-2019 **Published:** 18-Feb-2020

© 2020 Journal of Anaesthesiology Clinical Pharmacology | Published by Wolters Kluwer - Medknow