



## Potential mechanism for bilateral sensory effects after unilateral erector spinae plane blockade in patients undergoing laparoscopic cholecystectomy

Başak Altıparmak, MD · Melike Korkmaz Toker, MD · Ali İhsan Uysal, MD

Received: 4 June 2019/Revised: 5 June 2019/Accepted: 5 June 2019/Published online: 25 June 2019  
© Canadian Anesthesiologists' Society 2019

### To the Editor,

We read with great interest the recent correspondence in the *Journal* regarding if a unilateral erector spinae plane block (ESPB) can result in bilateral sensory blockade.<sup>1</sup> In that letter, Tulgar *et al.* presented a patient who experienced bilateral sensory blockade by a unilateral ESPB injection at the T9 level. That case highlighted a similar observation we have made in our own patients undergoing laparoscopic cholecystectomy (LC). We have been regularly performing bilateral ESPB as part of a multimodal analgesia plan in LC for almost two years. Following induction of anesthesia, our patients are placed in lateral position and 20 mL of 0.25% bupivacaine is injected as an ESPB on each side at the T7 level. Although we have reported favourable results with bilateral ESPB,<sup>2</sup> sometimes we prefer to perform only a right-sided block because of time constraints. In these cases, 30–40 mL 0.25% bupivacaine is injected unilaterally. Some of our patients who received unilateral ESPB reported similar postoperative pain scores to the patients who received bilateral ESPB. Moreover, postoperative opioid consumptions are frequently similar between these two groups.

**Editor's Note** The authors of the article: Can J Anesth 2019; DOI: <https://doi.org/10.1007/s12630-019-01402-y>, respectfully declined an invitation to submit a reply to the above letter.

B. Altıparmak, MD (✉) ·  
Department of Anesthesiology and Reanimation, Muğla Sıtkı  
Koçman University, Menteşe/Muğla, Turkey  
e-mail: basak\_ugurlu@yahoo.com

M. Korkmaz Toker, MD · A. İ. Uysal, MD  
Department of Anesthesiology and Reanimation, Muğla Sıtkı  
Koçman University Training and Research Hospital, Menteşe/  
Muğla, Turkey

We speculate two reasons for this unexpected bilateral effect of ESPB. Firstly, as we performed the block interventions prior to the skin incision, the subsequent pneumoperitoneum may be enhancing the spread of local anesthetic solution into the epidural space by increasing the intraabdominal pressure. This is supported by Desmet *et al.*<sup>3</sup> who evaluated the effect of pneumoperitoneum on the spread of local anesthetic solution in a cadaver model. They performed an ultrasound-guided transversus abdominis plane block before and after insufflation of the abdomen. Although the authors did not find a statistical difference in the dyed surface area between groups, the percentage of stained segmental nerves was higher after insufflation. A similar mechanism might influence the spread of local anesthetic solution in our patients following unilateral ESPB injection. Secondly, patients are traditionally placed in the reverse Trendelenburg position (15–20°) with the operating table slightly tilted leftwards during surgery. The gravitational impact of these positional changes may have an effect on the extent of local anesthetic spread. Previously, the spread of local anesthetic solution was shown to be affected by patient position during epidural blockade. Indeed, Hong *et al.*<sup>4</sup> performed epidural catheterization in the prone position and following catheter placement, the patients were placed either in the lateral decubitus or prone positions for three minutes. Those in the lateral decubitus position had a more extensive distribution of contrast material both in the cranial and caudad directions. The left-sided tilt may have similarly enhanced the contralateral effect of ESPB in our patients.

The speculative factors that we have highlighted above should also be considered in light of other mechanisms recently described by Schwartzmann *et al.*<sup>5</sup> Those authors reported in their magnetic resonance imaging study that a

contralateral sensory block was possible through the local anesthetic solution extending into the epidural via transforaminal spread. That potential imaging mechanism is now supported by the dermatome mapping evidence by Tulgar *et al.*<sup>1</sup> We suggest that future ESPB studies consider the potential effects of patient positioning, intraabdominal pressure, and the volume of injected solution on the extent of sensory blockade.

**Conflicts of interest** None declared.

**Editorial responsibility** This submission was handled by Dr. Hilary P. Grocott, Editor-in-Chief, *Canadian Journal of Anesthesia*.

## References

1. Tulgar S, Selvi O, Ahiskalioglu A, Ozer Z. Can unilateral erector spinae plane block result in bilateral sensory blockade? *Can J Anesth* 2019; DOI:<https://doi.org/10.1007/s12630-019-01402-y>.
2. Altıparmak B, Korkmaz Toker M, Uysal AI, Kuşçu Y, Gümiüş Demirbilek S. Ultrasound-guided erector spinae plane block versus oblique subcostal transversus abdominis plane block for postoperative analgesia of adult patients undergoing laparoscopic cholecystectomy: randomized, controlled trial. *J Clin Anesth* 2019; 57: 31-6.
3. Desmet M, Helsloot D, Vereecke E, Missant C, van de Velde M. Pneumoperitoneum does not influence spread of local anesthetics in midaxillary approach transversus abdominis plane block: a descriptive cadaver study. *Reg Anesth Pain Med* 2015; 40: 349-54.
4. Hong JH, Jung SW, Park JH. Posture influences the extent of spread of contrast medium during thoracic epidurography: a prospective randomized trial. *Pain Physician* 2017; 20: 501-8.
5. Schwartzmann A, Peng P, Maciel MA, Forero M. Mechanism of the erector spinae plane block: insights from a magnetic resonance imaging study. *Can J Anesth* 2018; 65: 1165-6.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.