Superior costotransverse ligament is the main actor in permeability between the layers? Target-specific modification of erector spinae plane block

To the editor,

There is controversy regarding mechanisms of action of the erector spinae plane block (ESPB). Both cadaveric and clinical imaging studies have shown local anesthesia spread between transverse processes and erector spinae muscles in craniocaudal direction with limited spread anteriorly. It has been shown that local anesthetics can spread to the paravertebral area by extending through the intertransverse ligament.¹

Accordingly, increasing the volume of local anesthetic resulted in better clinical effects.² In a cadaver study by Nielsen et al,³ it was shown that gaps were formed

Figure 1 Injection points of the modified ESPB (TP: transverse processes; P: pleura; red arrow: first injection; blue arrow: second injection). ESPB, erector spinae plane block.

between the superior costotransverse ligament (SCTL) in the thoracic paravertebral area which contained the dorsal rami of the spinal nerves.³ In addition, Nielsen *et al* demonstrated the passage of injection between the lateral costotransverse ligament and SCTL. On the contrary because of limited spread Ivanusic *et al*⁴ stated that that ESPB could not be an alternative to paravertebral block.

In our clinic, to increase the effectiveness of ESPB, we started using a double injection technique. 10 ml of local anesthesia is injected like a traditional ESPB between transverse process and muscle layers. Then, we advance the needle over the intertransverse ligament and inject 15 mL local anesthesia above the SCTL in the area between the two transverse processes (figure 1).

In our modification, although local anesthesia was given above the SCTL, it was seen that the downward orientation of the pleura indicating paravertebral spread. We have seen better clinical results since we started this modification of ESPB.

Sami Kaan Coşarcan , ¹ **Alper Tunga Doğan**,¹ **Ömür Erçelen**,¹ **Yavuz Gürkan**²

¹Anesthesiology, American Hospital, Istanbul, Turkey

²Anesthesiology and Reanimation, Koc University School of Medicine, Istanbul, Turkey

Correspondence to Dr Sami Kaan Coşarcan, Anesthesiology, American Hospital, Istanbul 34365, Turkey; skcosarcan@gmail.com

Contributors All authors contributed.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; internally peer reviewed.

OPEN ACCESS

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, an indication of whether changes were made, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

© American Society of Regional Anesthesia & Pain Medicine 2020. Re-use permitted under CC BY-NC. No commercial re-use. Published by BMJ.

Check for updates

To cite Coşarcan SK, Doğan AT, Erçelen Ö, *et al*. *Reg Anesth Pain Med* 2020;**45**:674–675.

Received 26 September 2019

Revised 24 November 2019

Accepted 27 November 2019

Published Online First 18 December 2019

Reg Anesth Pain Med 2020;**45**:674–675.

doi:10.1136/rapm-2019-101031

ORCID iD

Sami Kaan Coşarcan <http://orcid.org/0000-0003-1506-6435>

REFERENCES

- 1 Adhikary SD, Bernard S, Lopez H, *et al*. Erector spinae plane block versus Retrolaminar block: a magnetic resonance imaging and anatomical study. *Reg Anesth Pain Med* 2018;**43**:756–62.
- 2 Bang S, Chung K, Chung J, *et al*. The erector spinae plane block for effective analgesia after lung lobectomy. *Medicine* 2019;**98**:e16262.
- 3 Nielsen MV, Moriggl B, Hoermann R, *et al*. Are single injection erector spinae plan block and multiple injection costotransverse block equivalent to thoracic paravertebral block? *The Acta Anaesthesiologica Scandinavica* 2019;**00**:1–8.
- 4 Ivanusic J, Konishi Y, Barrington MJ. A cadaveric study investigating the mechanism of action of erector spinae blockade. *Reg Anesth Pain Med* 2018;**43**:567–71.