

Lumbar erector spinae plane block: a miracle or self-persuasion?

Dear editor

Erector spinae plane block (ESPB) was initially described at the thoracic level in 2016, with further indications subsequently reported at different vertebral levels.^{1,2} Lumbar ESPB (L-ESPB) has been used for many indications such as chronic low back pain, spinal surgery, herpes and lower extremity surgery.³⁻⁶ While radiological imaging has demonstrated that local anesthetic (LA) diffuses ventral to the transverse process (TP), anatomical studies report minimal such spread.^{6,7} What is the anatomical explanation for this discrepancy and how does it influence clinical practice?

In this Letter to the Editor, we wish to emphasize the importance of the middle thoracolumbar fascia (TLF) and the position of the needle tip in relation to the latter (figure 1). The middle TLF consists of three sublayers and attaches to the lateral edges of TPs.^{8,9} The anterior

TLF, on the other hand, passes between the psoas and the quadratus lumborum muscles, and attaches to the inner/anterior surface of TPs. However, none of these fascias extend to the lumbar vertebral body. Intertransverse ligaments and intertransverse muscles also constitute important anatomical barriers that can impact migration of LA molecules. For instance, in the thoracic region, one denotes the presence of superficial and deep intertransverse ligaments, intertransverse tissue complex and costotransverse ligament (the last two of which may not be present in the lumbar region).

In light of these different anatomical obstacles, we opine that the practitioner should advance the needle tip as deep as possible. Different hypothetical needle tip scenarios for L-ESPB are summarized in table 1 and illustrated in figure 2. Based on our experience, we recommend targeting the corner of the TP in a sagittal scan, and to insonate more than one TP in a longitudinal scan in order to confirm the LA distribution at more than one level during the injection process. These steps may promote LA diffusion ventral

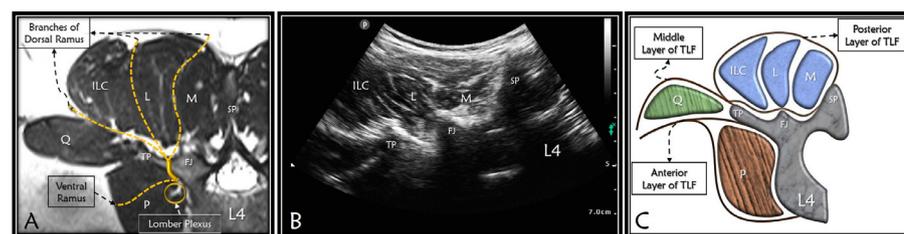


Figure 1 (A) L4 axial MRI of anatomical structures. (B) Transverse sonographic image of lumbar erector spinae plane. (C) Basic illustration of anatomical structures at the level of L4. FJ, facet joint; ILC, iliocostalis; L, longissimus; M, multifidus; P, psoas; Q, quadratus lumborum; SP, spinous process; TP, transverse process.

Table 1 Different needle scenarios for L-ESP				
Scenario	Needle tip position	Volume of local anesthetic	Predicted effect	Usage areas
Figure 2A,B	Dorsal to the TP between the ESM and the deep fascia of the ESM	Low volume	Sheath block—branches of dorsal ramus	Spinal surgery and chronic back pain
Figure 2C,D	Dorsal to the TP between the ESM and the deep fascia of the ESM	High volume	Sheath block—branches of dorsal ramus and partial transition to the anterior of the TP	Spinal surgery and chronic back pain
Figure 2E,F	Contiguous to the TP and ventral to the ESM muscle and deep fascia	Medium/high volume	Moderate transition to the anterior of the TP/possible lumbar plexus effect	Lower abdominal surgery Hip/proximal femur surgery/analgesia
Figure 2G,H	Deep to the intertransverse ligament and middle thoracolumbar fascia at the corner of the TP	Medium/high volume	High transition to the anterior of the TP/ lumbar plexus effect	Hip/proximal femur surgery/anesthesia

ESM, erector spinae muscles; TP, transverse process.

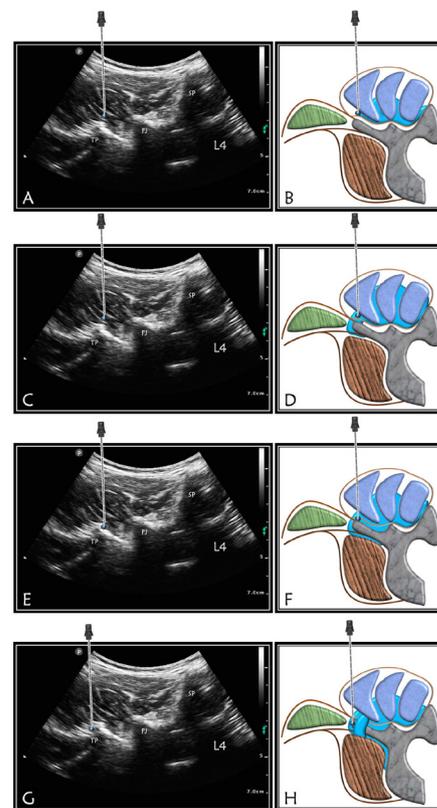


Figure 2 Ultrasound and illustration images of different needle scenarios for lumbar erector spinae plane. (A,B) Needle tip is positioned dorsal to the TP between the ESM and the deep fascia of the ESM with low volume. (C,D) Needle tip is positioned dorsal to the TP between the ESM and the deep fascia of the ESM with high volume. (E,F) Needle tip is advanced contiguous to the TP, ventral to the ESM muscle and deep fascia, with medium/high volume local anesthetic. (G,H) Needle tip is positioned deep to the intertransverse ligament and middle thoracolumbar fascia at the corner of the TP with mid-high volume. FJ, facet joint; SP, spinous process; TP, transverse process.

to TPs thereby resulting in lumbar plexus blockade.^{10,11} One should also remember that benefits of L-ESPB could partially stem from LA diffusion to the intervertebral foramen or the epidural space. Furthermore, LA spread could display similar patterns to those of posterior or transmuscular quadratus lumborum blocks.¹² Consequently, during the injection process, multiple sonographic views should be used to document LA spread ventral to the TP, between the psoas and quadratus lumborum muscles and between the erector spinae and quadratus lumborum muscles.

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