

Ultrasound-aided thoracic epidural catheter insertion: Description of a feasible technique

Dear Editor,

Epidural analgesia (EA) remains the gold standard for pain management after major thoracic and upper abdominal surgeries.^[1] Thoracic epidural catheterization (TEC) is an anatomically challenging technique.^[1] The benefit of ultrasound in difficult neuraxial blocks in the lumbar region is established.^[2] However, ultrasonographic visualization of the thoracic epidural space is hampered by the steep angulation of the thoracic spinous processes.^[3] We describe our application of ultrasound to identify the interlaminar space to aid TEC in two patients in whom we encountered difficulty in TEC using conventional landmark technique.

Our first patient was a 23-year-old male, weighing 70 kg, planned for right orchidectomy with retroperitoneal lymph node dissection under general anesthesia (GA) with EA. The second patient was a 58-year-old male, weighing 64 kg, diabetic and hypertensive, who was scheduled for a radical nephrectomy under GA and EA. In both cases, TEC placement with a 16 G Tuohy needle was attempted with full aseptic precautions at the T9-T10 and T8-T9 level respectively, using loss of resistance to air technique by the paramedian approach in right lateral position under sedation. Following unsuccessful attempts by the trainee and consultant anesthesiologists, ultrasound guidance was called for.

We used the linear array transducer (13-6 MHz, M-Turbo_ Ultrasound system; SonoSite, Bothell, WA, USA) to identify the interlaminar space and mark the skin puncture point at the upper border of lamina, 1–1.5 cm lateral to the midline, as shown in Figure 1. The Tuohy needle was inserted perpendicular to the skin to make contact with the lamina, followed by its medial and cephalad progression to pass through the interlaminar space into the epidural space.

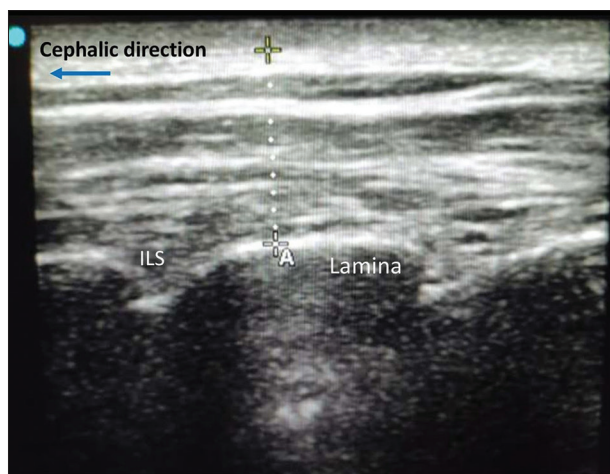


Figure 1: Parasagittal oblique view of thoracic spine at T8-T9 level obtained using ultrasound. ILS- interlaminar space. The dotted line marks the trajectory of the needle when inserted at the marked point. This ensures that the superior border of inferior laminae is reached and one can then easily walk over the lamina to enter the interlaminar space

Epidural catheter was inserted at the first attempt and its position was confirmed by demonstration of a dermatomal hypo-esthetic band.

The conventional blind epidural catheterization technique by midline approach with the spinous process tip as a landmark used for lumbar epidural catheterization is not possible in the thoracic region due to the steep angulation of thoracic spinous processes.^[1] Therefore, the paramedian interlaminar approach using the walk-over-the-lamina technique is often practiced.^[1] As the degree of angulation varies from high to low thoracic segments, the relationship of the tip of the spinous process to the paramedian interlaminar space (which is the gateway to the epidural space) also changes, making it less reliable as a landmark. Moreover, unlike the lumbar spine, the posterior dural complex is not a useful landmark in visualizing the thoracic spine due to the angulated spinous processes in this region.^[4] Therefore identification and use of interlaminar space and lamina as a landmark is an attractive option.

In conclusion, our technique of using ultrasound pre-scan to identify the lamina and the interlaminar space aids TEC, where the conventional technique is unsuccessful, and has a sound anatomical basis, is safe, easy to learn, and may be useful when faced with a difficult TEC.

Declaration of patient consent

We have obtained consent forms from patients for use of information, photography (not revealing patient identity) and patient details for medical writing.

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Conflicts of interest

There are no conflicts of interest.

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