



Letter to Editor

An unusual misplacement of epidural catheter in thoracic cavity: Role of meniscus test?

Vishnu Panwar^{1*} 

¹Dept. of Onco-Anaesthesia and Palliative Medicine, All India Institute of Medical Sciences, Delhi, India

Received: 26-07-2024; Accepted: 18-01-2025; Available Online: 2025

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), 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.

For reprints contact: reprint@ipinnovative.com

Epidural anaesthesia is a cornerstone of perioperative pain management, but even with standard confirmation techniques, unusual complications can arise. "We encountered a case of a misplaced epidural catheter in a 50-year-old female posted for Ivor-Lewis esophagectomy for carcinoma oesophagus. The thoracic epidural was put in T7-8 interspace with an 18G Touhy needle through a paramedian approach in the left lateral position after two failed attempts. An epidural catheter was threaded smoothly and fixed at 11 cm after confirmation of correct placement with loss of air resistance (LORA) technique with no aspiration of blood and CSF and a negative epidural test dose (3 ml 2% lignocaine with adrenaline). The patient didn't experience any cough, pain, or breathlessness. The anaesthesia was induced as the general protocol, and the surgery was started. Surgeons noticed the epidural catheter in the right intrapleural cavity (**Figure 1**). The pleural cavity showed no hematoma, so the surgery was allowed to proceed. At the end of the procedure, the catheter was removed.

Various tests are available to exclude subarachnoid and intravenous catheter placement. Meniscus test also indicates catheter placement in the epidural space, but none of the clinical tests can confirm the diagnosis of intrapleural placement. The meniscus test is based on differential pressure in the epidural space concerning the hydrostatic pressure created by the column of liquid in the catheter. The interpretation of the meniscus test may be misleading because

thoracic and abdominal pressures are also reflected in epidural pressure (-1 to -7 cm of H₂O in spontaneous breathing).¹ Moreover, the intrapleural pressure varies during spontaneous respiration (-4 to -8 cm of H₂O), during positive pressure ventilation (15-30 cm of H₂O) and cough (50-100 cm of H₂O).^{2,3} We didn't perform the meniscus test as it is not a routinely performed test.



Figure 1: A misplaced epidural catheter. The tip of the epidural catheter can be seen in the right thoracic cavity

Very few case reports have been published till now about intrapleural misplacement of epidural catheter, Sanaa Khan published a review article of 20 case reports.⁴ To ensure successful epidural placement, certain precautions are

*Corresponding author: Vishnu Panwar
Email: vishnupanwar6767@gmail.com

recommended. Multiple needle punctures at the same interspace should be avoided, and the catheter should be withdrawn immediately if resistance or extra force is encountered during threading. It is advisable to perform the procedure on an unsedated patient to observe potential symptoms such as cough or pain, which may indicate intrapleural misplacement. Also, after injecting local anaesthetic, bilateral sensory blockade should confirm epidural placement, while a unilateral block should prompt suspicion of intrapleural placement.

In conclusion, no clinical test, including the meniscus test, is definitive in confirming correct epidural placement. Performing the procedure in a conscious patient remains the safest approach, as it allows for early detection of signs and symptoms of intrapleural catheter misplacement.

1. Conflict of Interest

None.

References

1. Usubiaga JE, Moya F, Usubiaga LE. Effect of thoracic and abdominal pressure changes on the epidural space pressure. *Br J Anaesth.* 1967;39(8):612–8
2. Han SS, Lim YJ, Jeon Y, Min KB, Ahn WS, Lee SC. Effect of airway pressure on lumbar epidural pressure during positive pressure ventilation. *Korean J Anesthesiol.* 2011;61(2):138–42.
3. Yamazaki S, Ogawa J, Shohzu A, Yamazaki Y. Intrapleural cough pressure in patients after thoracotomy. *J Thorac Cardiovasc Surg.* 1980;80(4):600–4.
4. Khan S, Ahmed WN, Aleem A, Rehman S. Inadvertent Placement of Thoracic Epidural Catheter in Pleural Cavity: A Case Report and Review of Published Literature. *Cureus.* 2023;15(4):e37642.

Cite this article: Panwar V. An unusual misplacement of epidural catheter in thoracic cavity: Role of meniscus test?". *Indian J Clin Anaesth.* 2025;12(3):554–555.