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Ultrasound Images of the Epidural Space through the Acoustic Window of the Infant

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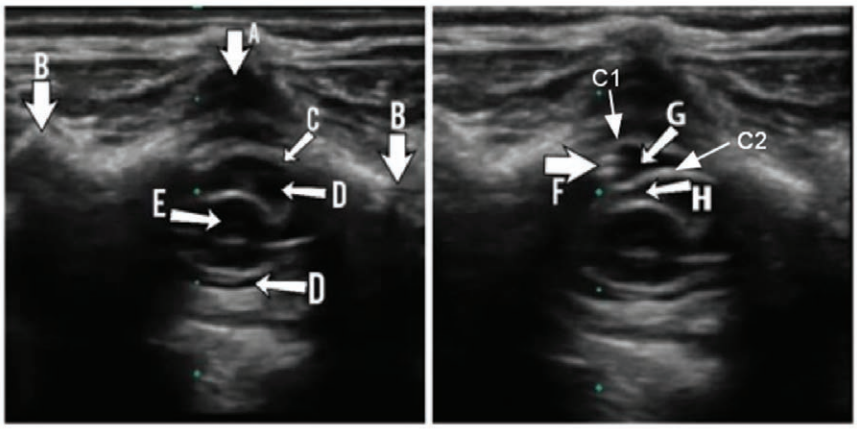

EPIDURAL analgesia, a core competency of anesthesiology, is traditionally accomplished using surface landmarks and blind needle insertion into a potential space between the ligamentum flavum and dura. While vertebral ossification prevents detailed ultrasound images of the epidural space in adults, the absence of ossification of the infant spine provides excellent acoustic windows and an opportunity for visualization.[1]

We present images of a 5-day-old, 3.2-kg infant having a tracheoesophageal fistula repair *via* thoracotomy. The epidural catheter was placed into the caudal canal using ultrasound imaging and advanced to T5. The spine was imaged transversely with a high-frequency linear transducer before and after injection of local anesthetic. The figure shows the spinous (A) and transverse (B) processes, the cerebrospinal fluid (D), the spinal cord (E), and the creation of the epidural space (G) between the ligamentum flavum (C1) and dura (C2) deforming the subarachnoid space with displacement of cerebrospinal fluid (H). This can be seen in the Supplemental Digital Content 1, video 1, http://links.lww.com/ALN/B339. The catheter tip (F) is visible.

Epidural catheter placement is common for major thoracoabdominal surgeries, but detailed ultrasound images are unique to younger infants.[2] At the age of 9 months, vertebral ossification becomes more robust, impedes transmission of ultrasound waves, and causes shadowing of underlying structures resulting in increasingly narrow acoustic windows. Imaging is further challenged in larger patients since sound-wave degradation is directly proportional to the amount of tissue penetrated. Real-time ultrasound images may improve the efficacy and safety of blind epidural catheter insertion, but crisp imaging is limited to young infants. These unique views may assist with overall understanding of neuraxial dynamics.

Competing Interests

The authors declare no competing interests.

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