

Introduction

- Epidural analgesia in neonates undergoing abdominal surgery provides opioid sparing benefits and robust pain control.
- Precise epidural placement is critical, and neonates are particularly challenging candidates.
- The use of ultrasound-guided or -assisted (USGA) epidural catheter placement allows placement confirmation without significant risks.
- In neonates, whose cartilaginous spinal structures are unossified, ultrasound also allows unimpeded viewing of the neuraxis, making it an ideal modality to facilitate epidural catheter placement.

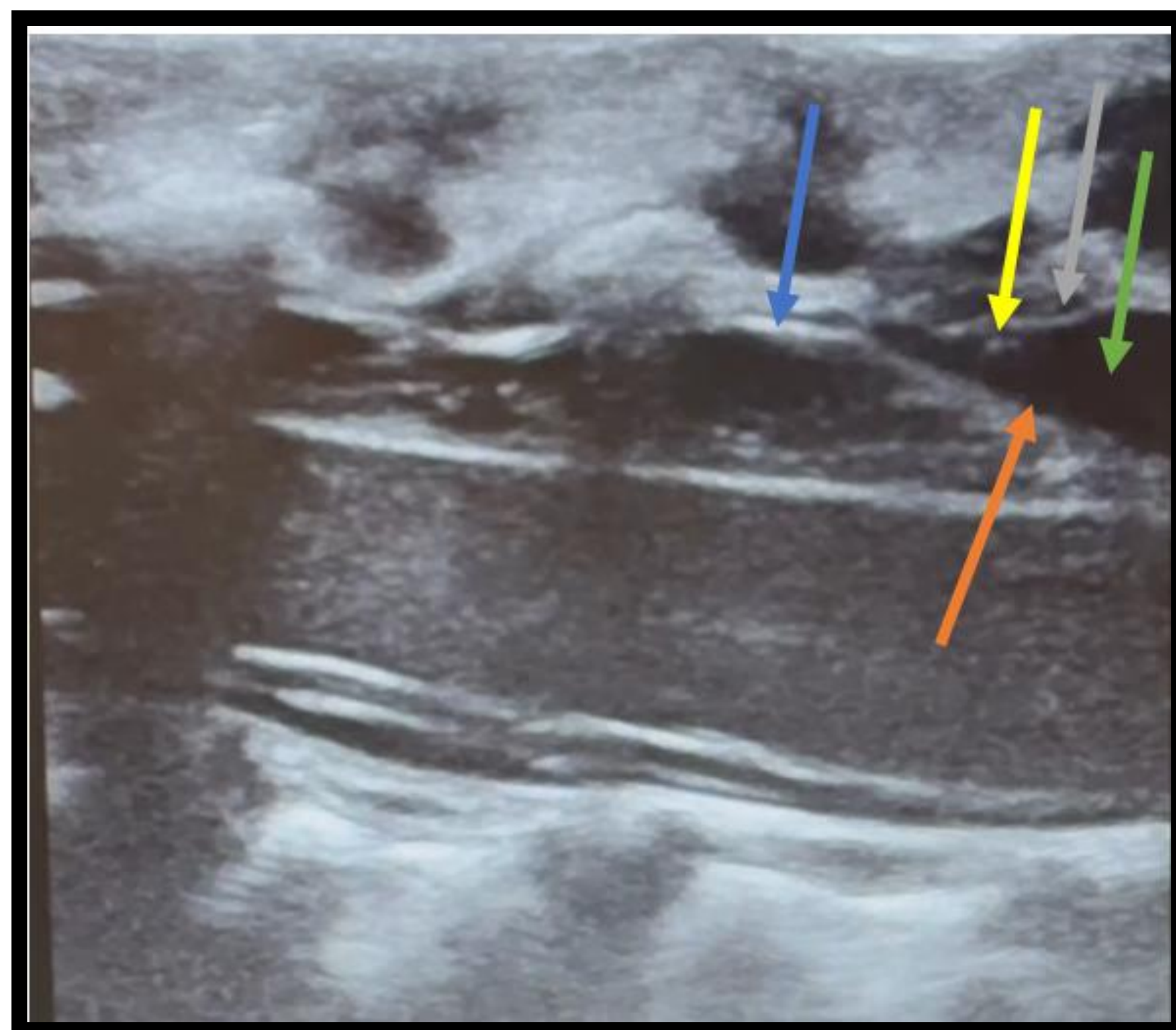


Figure 1: Separation ligamentum flavum, dura, and dilation of epidural space. [Blue arrow = posterior complex; yellow arrow = catheter tip; orange arrow = posterior dura; grey arrow = ligamentum flavum; green arrow = LA in epidural space]

Case Report

- A 2.36 kg, 3-day-old term neonate with Trisomy 21 and duodenal atresia presents for open repair.
- After induction and intubation, the patient was placed left lateral decubitus for caudal epidural catheter placement. Distance from desired thoracic level and insertion site was measured.
- An 18-gauge IV catheter was inserted and loss of resistance was noted, the needle was removed and the IV catheter left in place.
- A dose of local anesthetic was injected while midline sagittal ultrasound imaging was performed to assess epidural catheter location.
- The epidural catheter was easily advanced through the IV catheter until tissue deflection was noted at the desired level.
- The case proceeded uneventfully, and an epidural infusion of 1% Chloroprocaine was initiated.
- Analgesia remained excellent with the epidural catheter alone on POD#1-3.

Challenges: Small patient size (<3 kg neonate)
Catheter placement technique difficult
Limited maximum local anesthetic dose

References

1. Maitra S, Baidya DK, Pawar DK, Arora MK, Khanna P. Epidural anesthesia and analgesia in the neonate: a review of current evidences. J Anesth. Oct 2014;28(5):768-79. doi:10.1007/s00540-014-1796-8
2. Ponde VC, Bedekar VV, Desai AP, Puranik KA. Does ultrasound guidance add accuracy to continuous caudal-epidural catheter placements in neonates and infants? Paediatr Anaesth. Oct 2017;27(10):1010-1014. doi:10.1111/pan.13212

Discussion

- Placing epidural catheters in neonates is challenging, yet optimized, opioid-sparing analgesia is important for avoiding deleterious effects of poor pain control and supporting early return of bowel function.
- Confirmation of catheter tip location with USGA is efficient, avoids radiation exposure, requires little additional skill or training, and is very helpful for optimizing catheter-based analgesia in a vulnerable patient population.

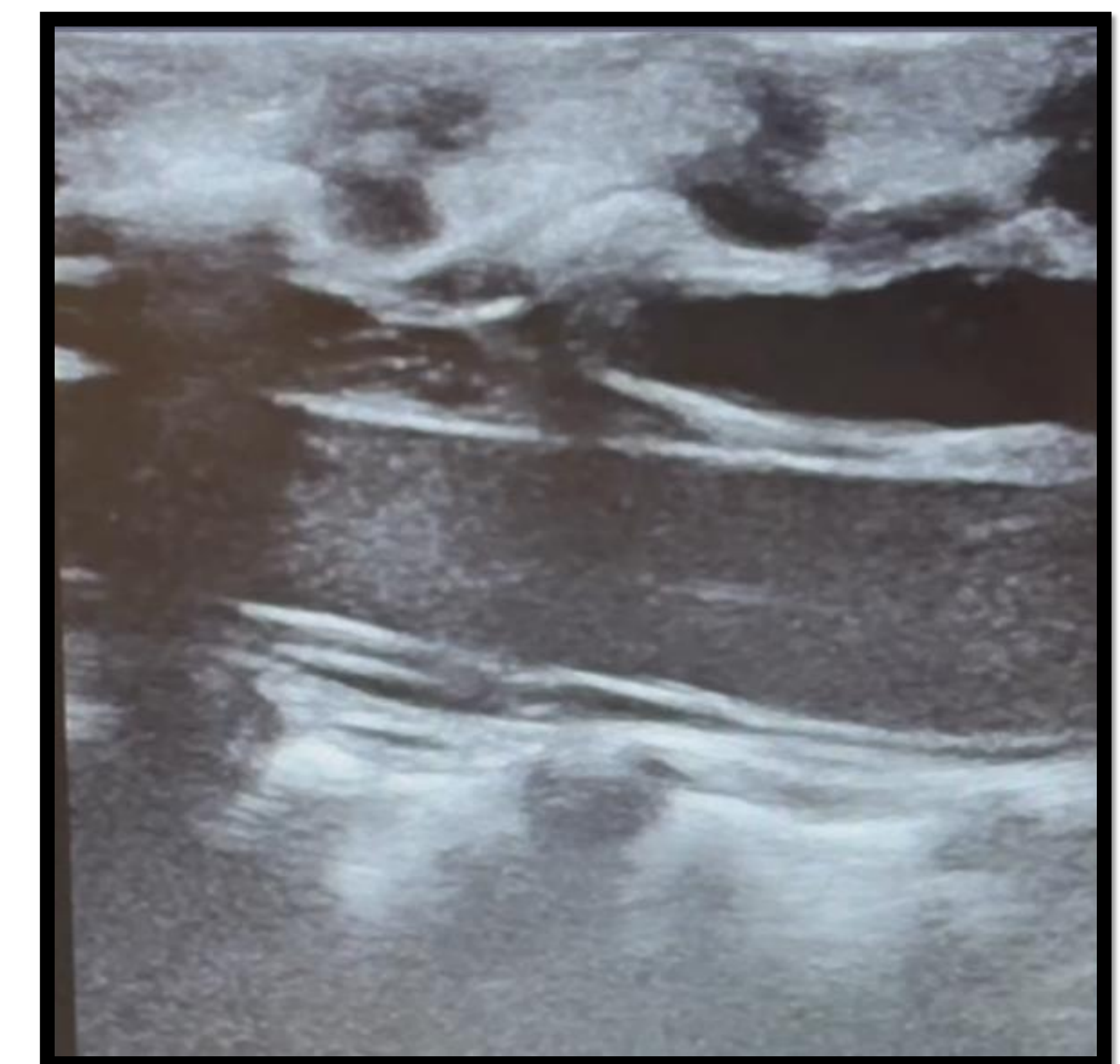


Figure 2: Further dilation of the thoracic epidural space from spread of LA with "unzippering" of posterior complex components.