

Ultrasound-Guided Assessment of ESP Catheter Position in Adults Undergoing Cardiac Surgery: A Prospective Observational Study

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Catheter-based erector spinae plane (ESP) analgesia is a popular opioid-sparing technique for adults undergoing cardiac surgery. Retrospective evidence suggests ESP catheters may migrate out of the ESP plane at an alarming rate.

Methods:

- Prospective, IRB-approved, single-center cohort study.
- Adults, undergoing cardiac surgery.
- Planned indwelling ESP catheter placement
- Written informed consent.

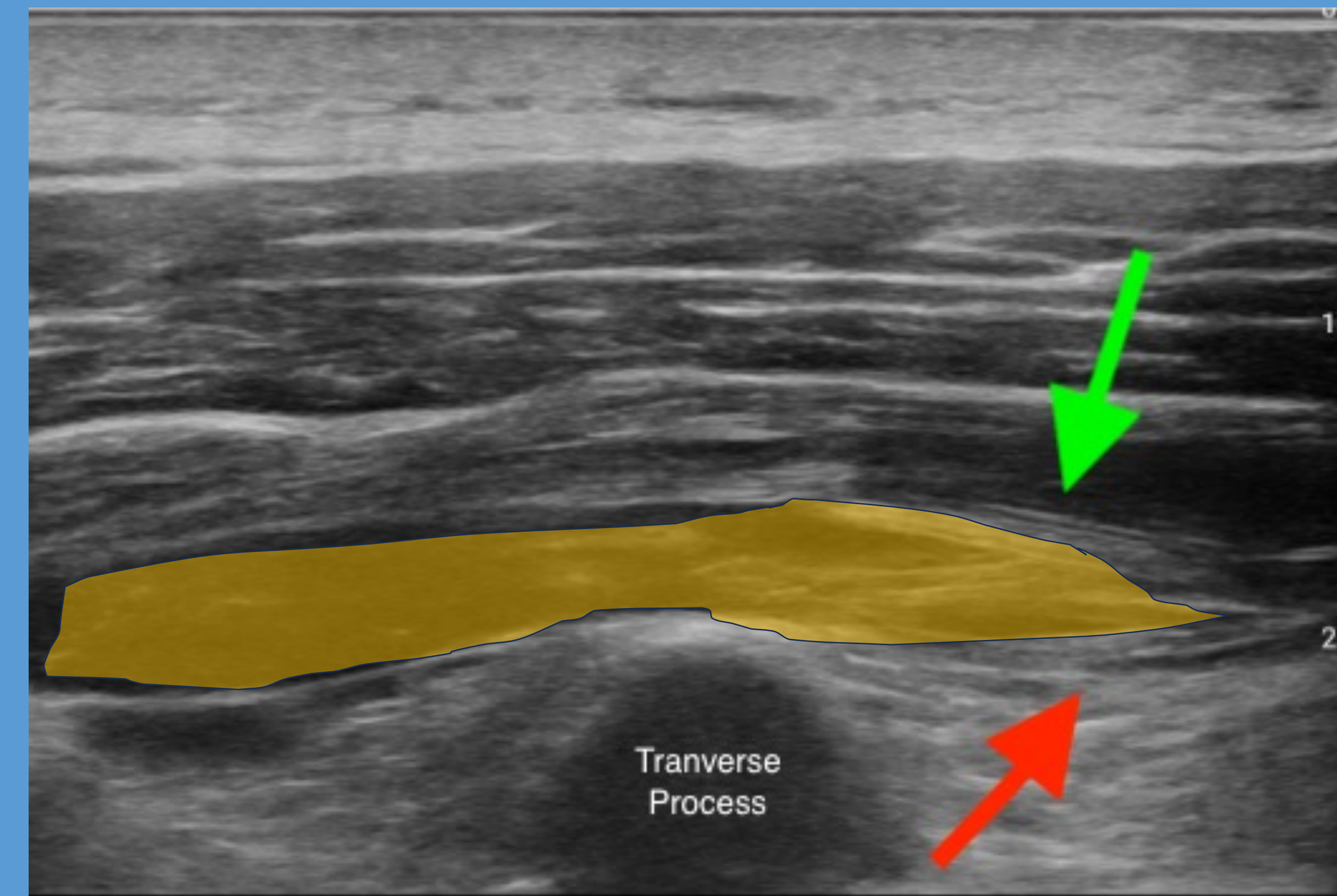
Outcomes:

Feasibility of ultrasound to evaluate catheter position
Rate of ESP migration.
Ease of placement.

Statistical considerations:

- Hypothesis: **Over-the-needle ESP catheters have a 60 ±10% migration rate.**
- N= 93 visualized catheters.

Most over-the-needle catheter systems migrate outside the ESP plane early after open-heart surgery



Left: ESP catheter (indicated by green arrow) entering and expanding the ESP plane (indicated by red arrow)

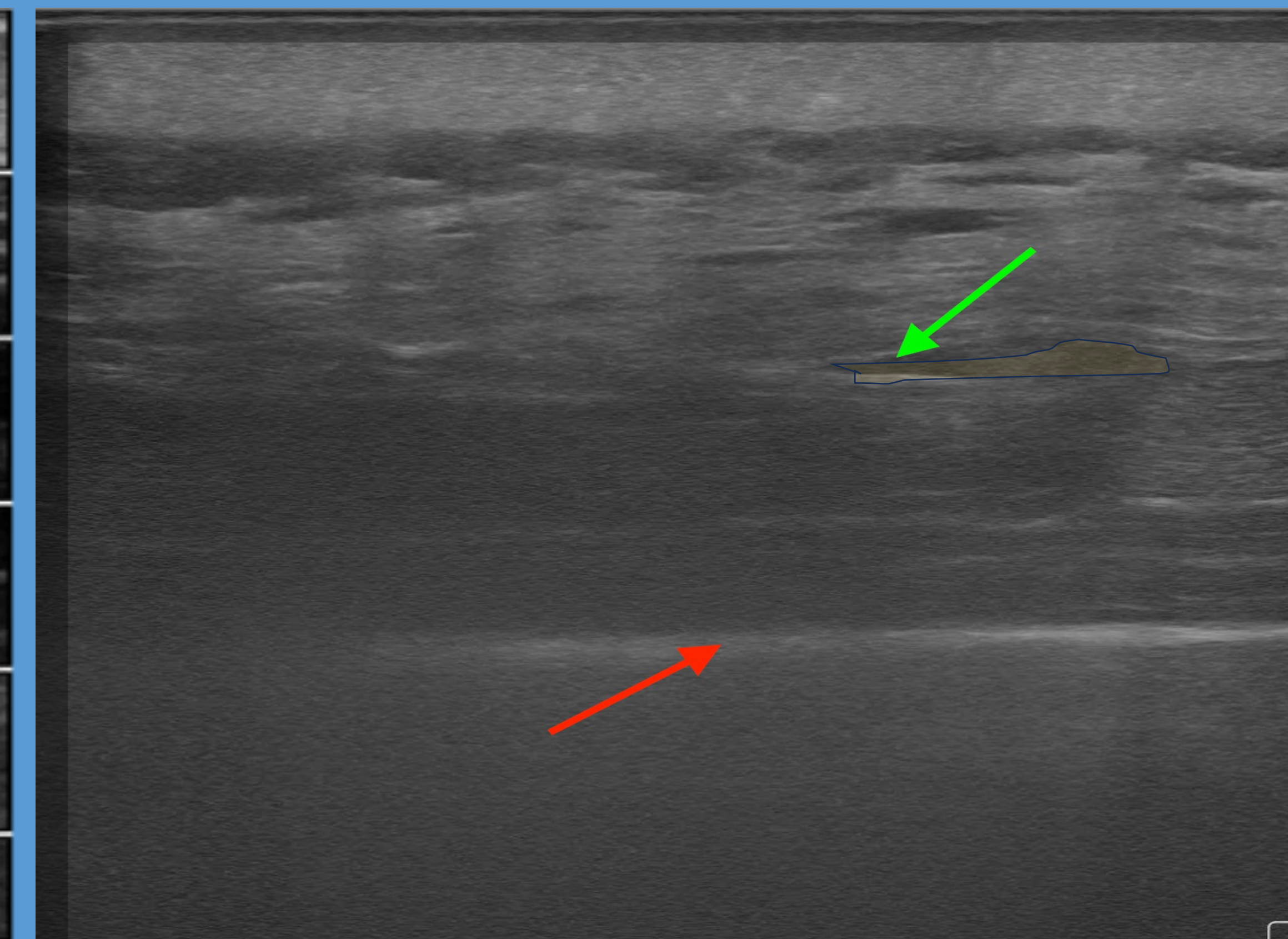


Image 2 (right): ESP catheter (green arrow) seen to be out of the fascial plane when assessed on POD 1

References:

1. Wu M, Barrak C, Forrest P, Rizzo D, Guerra-Londono CE. Assessment of catheter position using chest CT in adults undergoing erector spinae plane analgesia for rib fractures: a retrospective cohort study. Reg Anesth Pain Med. 2025 Oct 6;50(10):779-785. doi: 10.1136/rapm-2024-105673. PMID: 38969508.
2. Nair A, Saxena P, Borkar N, Rangaiah M, Arora N, Mohanty PK. Erector spinae plane block for postoperative analgesia in cardiac surgeries- A systematic review and meta-analysis. Ann Card Anaesth. 2023 Jul-Sep;26(3):247-259. doi: 10.4103/aca.aca_148_22. PMID: 37470522; PMCID: PMC10451138.

Results:

1. Most ESP catheters required hydrolocation assistance to visualize the catheter tip.
2. Most anesthesiologists reported catheter placement to be easy and allow advancement into ESP plane.
3. ESP catheters migrate at an alarmingly high rate:
 1. POD 1: 25/42 patients have at least 1 catheter in plane.
 2. POD 2: 2/42 patients with at least 1 catheter in plane.
 3. POD 3: No patients with catheters in plane

Our takeaway:

There is a need to **re-evaluate** the placement of indwelling ESP catheters for postoperative analgesia after cardiac surgery.