School of Medicine and Public Health
UNIVERSITY OF WISCONSIN–MADISON

Postoperative Imaging Assessment of External Oblique Intercostal Catheter Retention in Liver Transplant Patients

Julia S. Roberts, BS[1], Calvin Harberg, MD[2], Kristopher Schroeder, MD, FASA, FASRA[2]
University of Wisconsin School of Medicine and Public Health[1]
Department of Anesthesia[2]



Introduction

- EOI catheters provide effective upper abdominal analgesia and may reduce postoperative opioid requirements and opioid-related adverse events following liver transplantation.[2, 3]
- Catheter plane maintenance is important for sustained analgesic efficacy but has not been well studied for EOI catheters.
- Recent evidence demonstrated frequent dislodgement of ESP catheters from the intended fascial plane in patients with traumatic rib fractures.[1]
- We hypothesized that EOI catheters would demonstrate greater maintenance of the intended fascial plane compared with previously reported ESP catheter data, in which approximately 90% were dislodged from the intended plane.[1]

Method

Design: Retrospective Cohort Study
Setting: University of Wisconsin–Madison
Study period: May 2024–May 2026
Population: 263 liver transplant recipients
125 received EOI catheters
25 underwent subsequent abdominal CT imaging
50 EOI catheters were available for radiographic evaluation
Catheter type: 28 through-the-needle, 16 over-the-needle, 6 unable to be determined
CT assessment: Two fellowship-trained regional anesthesiologists independently reviewed CT images and reached consensus regarding catheter position relative to the intended fascial plane.
Variables collected: Age, BMI, sex, catheter type, catheter dwell time, CT catheter position, and interval surgical interventions.

Results

- **21/50 (42%)** EOI catheters remained within the intended fascial plane.
- **26/50 (52%)** were located outside the intended fascial plane.
- **3/50 (6%)** could not be evaluated.
- Catheters located superficial to the intended fascial plane were typically **<5 mm from the target plane**.
- **Pajunk and Arrow/Teleflex catheters demonstrated similar rates of maintenance within the intended fascial plane.**
- **10 of 25 patients (40%)** undergoing CT imaging had undergone laparotomy

Catheter Type	In Intended Plane, n (%)	Out of Intended Plane, n (%)	Not Evaluable, n (%)	Total Catheters
Arrow	11 (39%)	17 (61%)	0 (0%)	28
Pajunk	5 (31%)	9 (56%)	2 (13%)	16
Unknown	5 (83%)	0 (0%)	1 (17%)	6
Total	21 (42%)	26 (52%)	3 (6%)	50

Table 1: Postoperative external oblique intercostal catheter position on CT imaging by catheter type.

Descriptive Statistics	Days
Mean	3
Median	3
Range	1 to 6

Table 2: Timing of placement of catheter to imaging acquisition

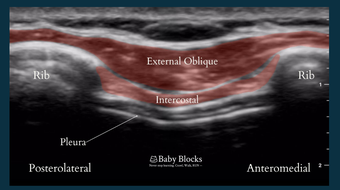


FIgure1: Ultrasound view of EOI plane

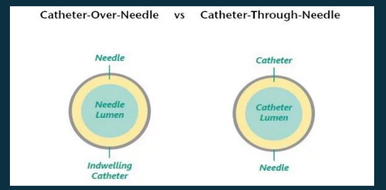


Figure 2: Arrow and Pajunk Catheters

Discussion

- EOI catheters demonstrated potentially greater fascial plane retention than previously reported for ESP catheters.
- Differences in catheter retention may relate to anatomical location, insertion angle, catheter length within the fascial plane, or timing of postoperative imaging.
- Exploratory laparotomy may contribute to catheter displacement.
- Similar retention between catheter types suggests that catheter design may not be a major determinant of fascial plane maintenance.
- Further studies are needed to determine whether fascial plane catheter position correlates with analgesic efficacy and clinical outcomes.

Contact and References

1. Wu M, et al. *Assessment of catheter position using chest CT in adults undergoing erector spinae plane analgesia for rib fractures: a retrospective cohort study.*
2. Erskine RN, White L. *A review of the external oblique intercostal plane block: A novel approach to analgesia for upper abdominal surgery.*
3. Chin KJ, McDonnell JG, Carvalho B, Sharkey A, Pawa A, Gadsden J. *Essentials of Our Current Understanding: Abdominal Wall Blocks*

Contact Information: Julia Roberts at jsburns5@wisc.edu