

# External Oblique Intercostal Block Catheters for Abdominal Surgeries: case reports of two different surgeries

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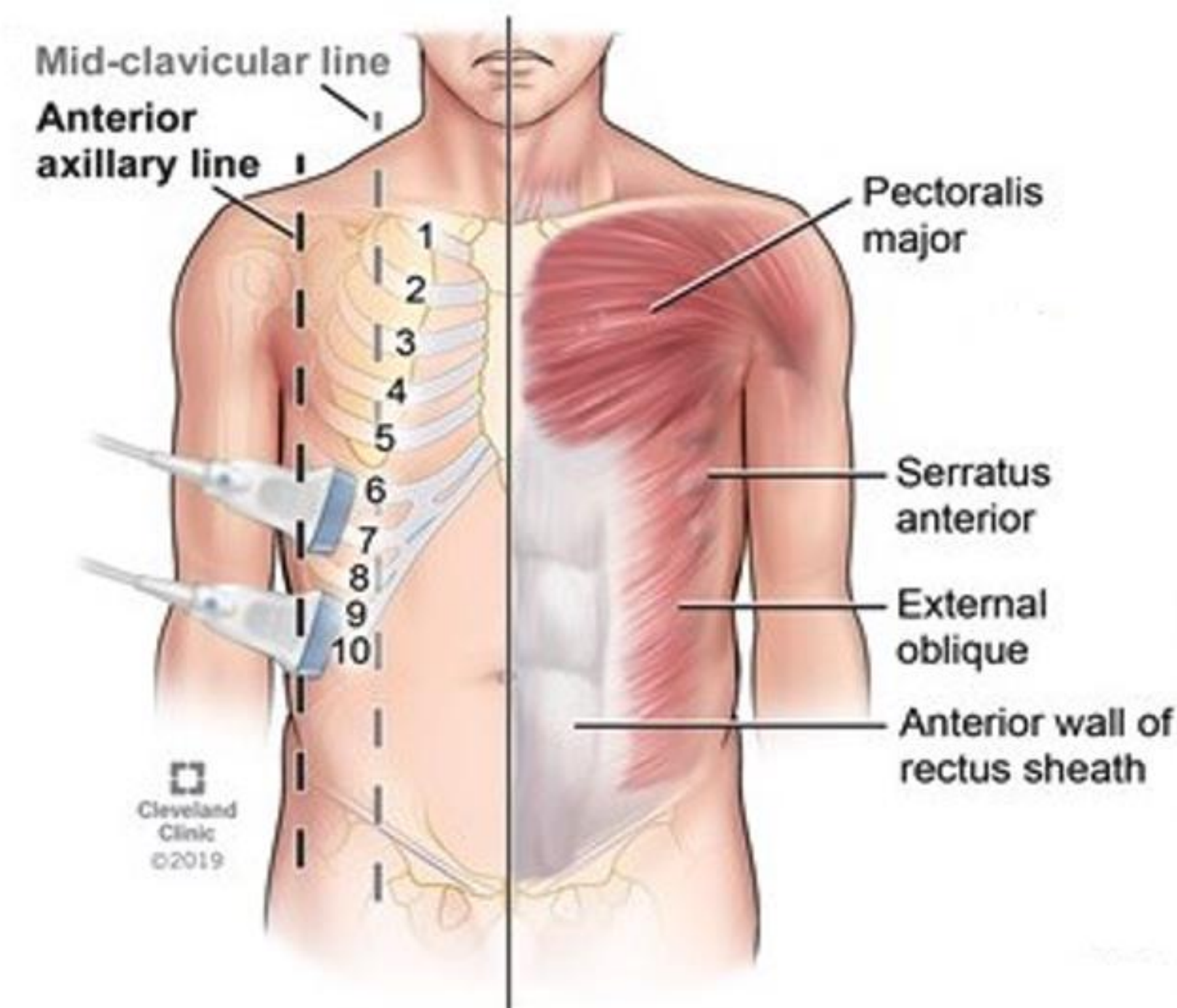
## Background

Neuraxial and transabdominal plane (TAP) blocks are frequently incorporated into multimodal analgesic pain management regimens for abdominal surgeries. However, thoracic epidurals are being used less frequently due to contraindications, such as coagulopathy, hemodynamic instability, or insufficient analgesia for certain surgeries involving the upper abdomen.

The external oblique oblique intercostal (EOI) block has been described as a novel regional technique that targets the lateral and anterior cutaneous branches of T7-T10's intercostal nerves and provides somatic blockade of the lateral and midline regions of dermatomes T6-T10.

This block provides analgesia to the upper lateral and anterior abdominal wall area, and can play a role in acute postoperative pain management for surgical incision in this area (1). We present two patients, each undergoing different abdominal surgeries involving subcostal incisions, who received EOI blocks and catheter.

**Figure 1. Anatomy of US probe placement for EOI block**



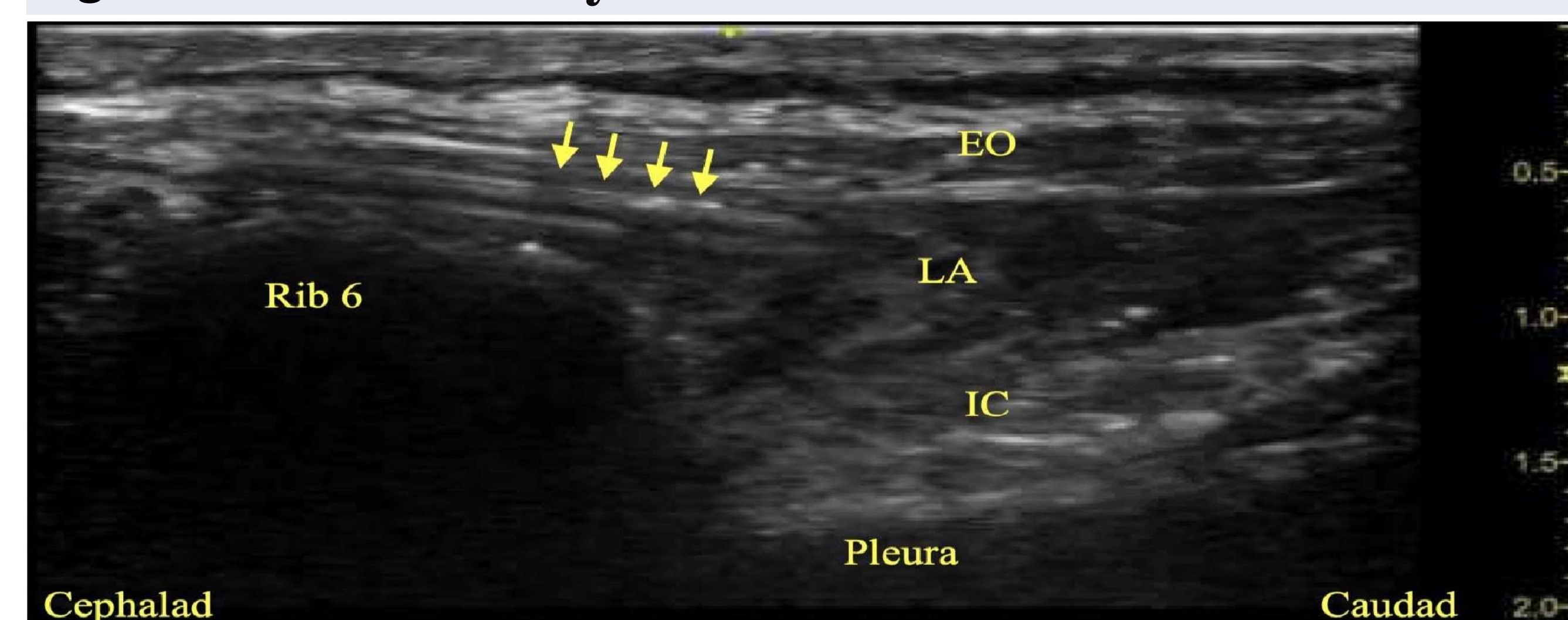
## Material and Methods

Both patients gave consent to have their cases written up. Both cases are devoid of patient identifiable information, and are thus exempt from IRB review requirements per Hartford Healthcare policy.

**In Case 1**, we performed the EOI block by placing the ultrasound (US) probe in a sagittal orientation between the anterior axillary line and mid clavicular line at the level of the 6th rib (See Figure 1). A needle was advanced cephalad to caudad, in-plane, deep to the external oblique muscle overlying the sixth rib (see Figure 2). Local anesthetic was deposited in the plane between the external oblique muscle and intercostal muscle, and the needle was directed caudally toward the seventh rib. A nerve catheter was then threaded into the space and secured. She received an initial injection of 40 ml 0.25% ropivacaine with 1:400k epinephrine, and was started on an infusion of 0.2% ropivacaine at 4 ml/hr. We administered a 20 ml bolus dose of 0.2% ropivacaine on post-op day (POD) 1; the nerve block catheter was removed and the patient was subsequently discharged on POD 1.

**In Case 2**, the patient received an initial injection of 30 ml 0.25% ropivacaine with epinephrine (1:400K), and was started on an infusion of 0.2% ropivacaine at 8 ml/hr. We administered a 20 ml bolus dose of 0.2% ropivacaine on POD 1-4, and the patient was subsequently discharged on POD 4.

**Figure 2. Sonoanatomy of EOI block**



**Key:** EO: external oblique muscle, IC: intercostal muscle, LA: local anesthetic spread, Arrows: needle position

## Results/ Case Reports

### Case 1:

A 57-year-old woman underwent an exploratory laparotomy and liver resection via a right subcostal incision. A right-sided EOI block was performed pre-emergence.

This patient received a total of 2mg hydromorphone IV immediately postoperatively in the recovery room.

Her multimodal analgesic regimen consisted of acetaminophen 975 mg PO every six hours; she required no narcotics after the immediate postoperative period.

### Case 2 :

A 60-year-old woman underwent an open repair of a left renal artery aneurysm via a left subcostal incision. A left-sided EOI block was performed pre-emergence, and a continuous nerve catheter was secured in place.

This patient was started on a multimodal analgesic regimen consisting of acetaminophen 975 mg PO every six hours, ibuprofen 800 mg PO every eight hours, ketorolac 7.5 mg IV every six hours, gabapentin 200 mg three times daily, oxycodone immediate release 10 mg PO every three hours as needed for severe pain - for which she required three doses, and oxycodone immediate release 5 mg PO every three hours as needed for moderate pain - for which she required 14 doses over the course of post-op days 0-4.

## Discussion

Each of our patients who received the EOI nerve block and catheter reported adequate analgesia, decreased pain with deep respiration, and overall increased patient satisfaction when evaluated each day during their hospital admission.

These case results support the use of EOI block as an appropriate substitute for neuraxial anesthesia in similar abdominal surgeries involving subcostal incisions. As the field of regional anesthesia continues to rapidly evolve, the EOI block may become part of the armamentarium for managing acute post-operative pain for surgeries involving the upper midline and lateral abdominal regions.

Randomized control trials should be done to more definitively measure the efficacy of the EOI nerve block relative to neuraxial anesthesia in analgesia, acute postoperative pain management, and patient outcomes.

## References

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