

Motor-Sparing Ultrasound-Guided Clavipectoral Fascial Plane Block as an Alternative to Interscalene Brachial Plexus Block for Patients Undergoing Clavicle Fixation Surgery

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ABSTRACT

- Clavicle fractures pose a challenge for pain management in the perioperative period due to complex clavicular innervation.
- Current technique to provide regional anesthesia for clavicle fixation surgery entails the use of an Interscalene Brachial Plexus Block (ISB) with or without Cervical Plexus Block (CPB).
- Known side-effects of ISB include ipsilateral diaphragmatic paralysis and upper extremity motor blockade, which may make ISB inappropriate for select patient populations or undesirable for post-operative evaluation of upper extremity neurologic function, mobility and recovery.
- We present two cases in which an ultrasound-guided clavipectoral fascial plane block (CFPB) combined with Superficial Cervical Plexus Block (SCPB) provided perioperative analgesia for clavicle fixation surgery.

CASE PRESENTATION

Patient #1: 16 y/o male with no significant past medical history presenting for right midshaft clavicle fracture with complete displacement after fall accident doing parkour.

Patient #2: 52 y/o male with no significant past medical history presenting for left midshaft clavicle fracture with complete displacement after bicycle accident.

METHODS & MATERIALS

Patient Selection: We identified two patients with clavicle fractures who were scheduled for surgical fixation at one academic medical center.

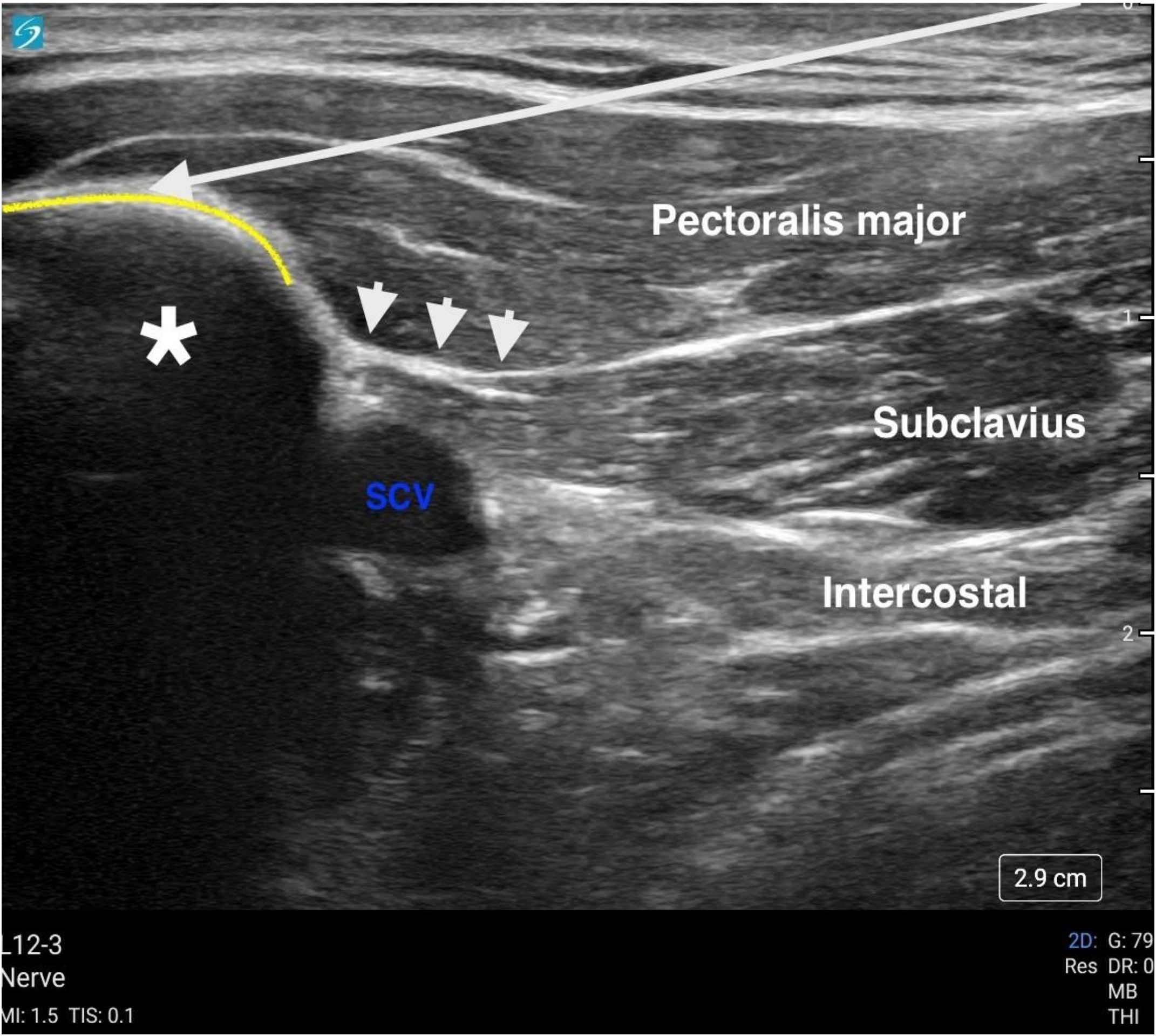
Participation: Following completion of informed consent, both patients elected to proceed with CFPB + SCPB prior to surgery.

Technique: CFPB + SCPB were performed using in-plane ultrasound guidance. Standard ASA monitors and supplemental O₂ via nasal cannula were applied, and midazolam 2 mg IV administered prior to block initiation.

Positioning: Supine, with HOB elevated to 30 degrees. A linear probe was placed over the clavicle in parasagittal orientation, with probe marker oriented cephalad for CFPB. For SCPB, the probe was repositioned in a transverse orientation over the midpoint of the sternocleidomastoid (SCM).

Approach: Both blocks were completed with an in-plane approach. Upon entry into the CF, 20 cc of 0.5% ropivacaine with 1:400,000 epinephrine was deposited through a 4-inch stimulating needle. For SCPB, 5 mL of the same mixture was used. Negative aspiration prior to each 5 mL aliquot.

Flow of Patient Care: After block completion, patients received general anesthesia intraoperatively. Following surgery, both patients recovered in the PACU and were discharged the same day.



This image is a replication of the view that was used to accomplish the CFPB.

Key: Asterisk: clavicle; yellow line: intended local anesthetic spread; SCV: subclavian vein; long white arrow: intended needle trajectory; downward pointing arrows: clavipectoral fascia.

RESULTS

Intra-Op

Patient #1 received 200mcg IV Fentanyl and 0.5mg IV Hydromorphone.

Patient #2 received 100mcg IV Fentanyl and 0.2mg IV Hydromorphone.

PACU

Patient #1 did not require any opioids and met PACU discharge criteria 35 minutes after PACU arrival. Pain score at time of PACU discharge was 0/10.

Patient #2 received 12.5 mcg IV fentanyl. The patient met PACU discharge criteria 45 minutes after arrival, at which time they reported a pain score of 2/10.

Follow-Up

Both patients endorsed minimal pain during routine follow-up in the orthopedic clinic on POD #12. Their pain was reported as well controlled with oral acetaminophen and ibuprofen as needed.

DISCUSSION

- In both cases, the patients required low doses of intravenous opioid medications intraoperatively, indicating adequate sensory blockade of the clavicle and operative field. Both patients had minimal pain in the immediate postoperative period, met PACU discharge criteria within one hour of arrival, and were discharged from the hospital on the same day without complication. One patient required a small dose of fentanyl during their PACU stay whereas the other did not require any additional opioids. These metrics indicate that CFPB with SCPB is a promising alternative to ISB with CPB for patients undergoing clavicle surgery, with adequate analgesia, motor sparing blockade, and excellent safety profile.
- Limitations of these cases include that there were only two patients studied and both patients had mid-shaft, fully displaced clavicle fractures; therefore, we do not demonstrate successful use of this technique with differing location of fracture. Additionally, there were different anesthesia providers that cared for the patients in the intraoperative period which exposes these patients to variation in practice patterns and analgesic strategies.

FUTURE INVESTIGATION

- Future investigation of this technique is warranted to determine the volume and dose of local anesthetic that best optimizes the analgesic effect of this technique.
- Further utilization of the CFPB can better evaluate if it is an efficacious regional technique for patients with varied presentation and location of clavicle fracture.
- Direct comparison of the duration and analgesic efficacy of CFPB + SCPB to other commonly used techniques (such as ISB with CPB) will help further determine the suitability of this technique as a mainstay of analgesic therapies for patients undergoing clavicle surgery.

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