

Continuous Costoclavicular Nerve Block Catheter Used as a Primary Anesthetic and for Post Operative Pain Control

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Introduction:

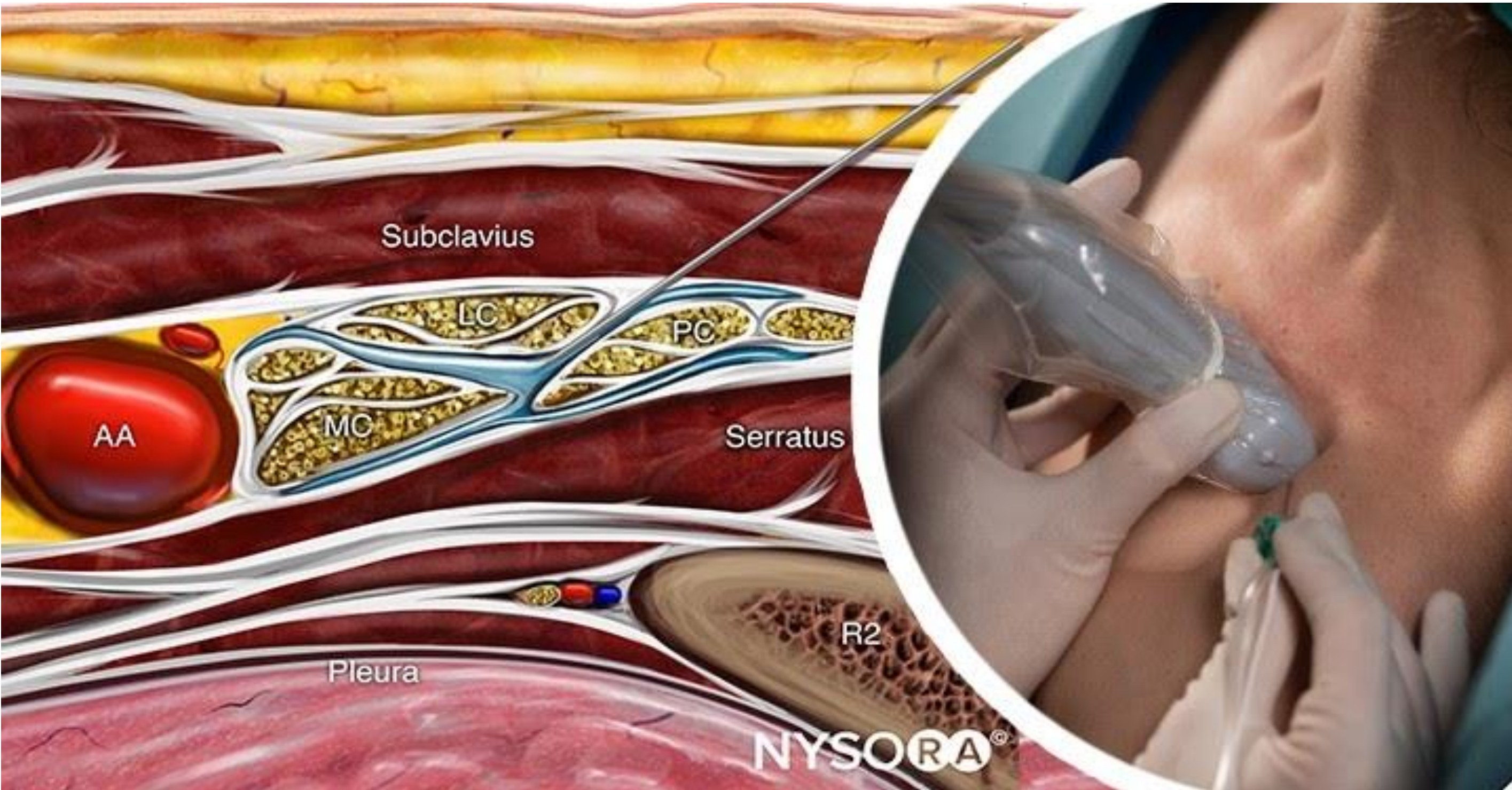
The Costoclavicular brachial plexus block was first described in 2015 to overcome some of the potential disadvantages of the traditional lateral sagittal Infraclavicular block [1]. The costoclavicular block technique is an infraclavicular approach where local anesthetic is injected into the costoclavicular space at the level of the cords resulting in ipsilateral motor and sensory blockade of the terminal nerves of the brachial plexus.

Case Description:

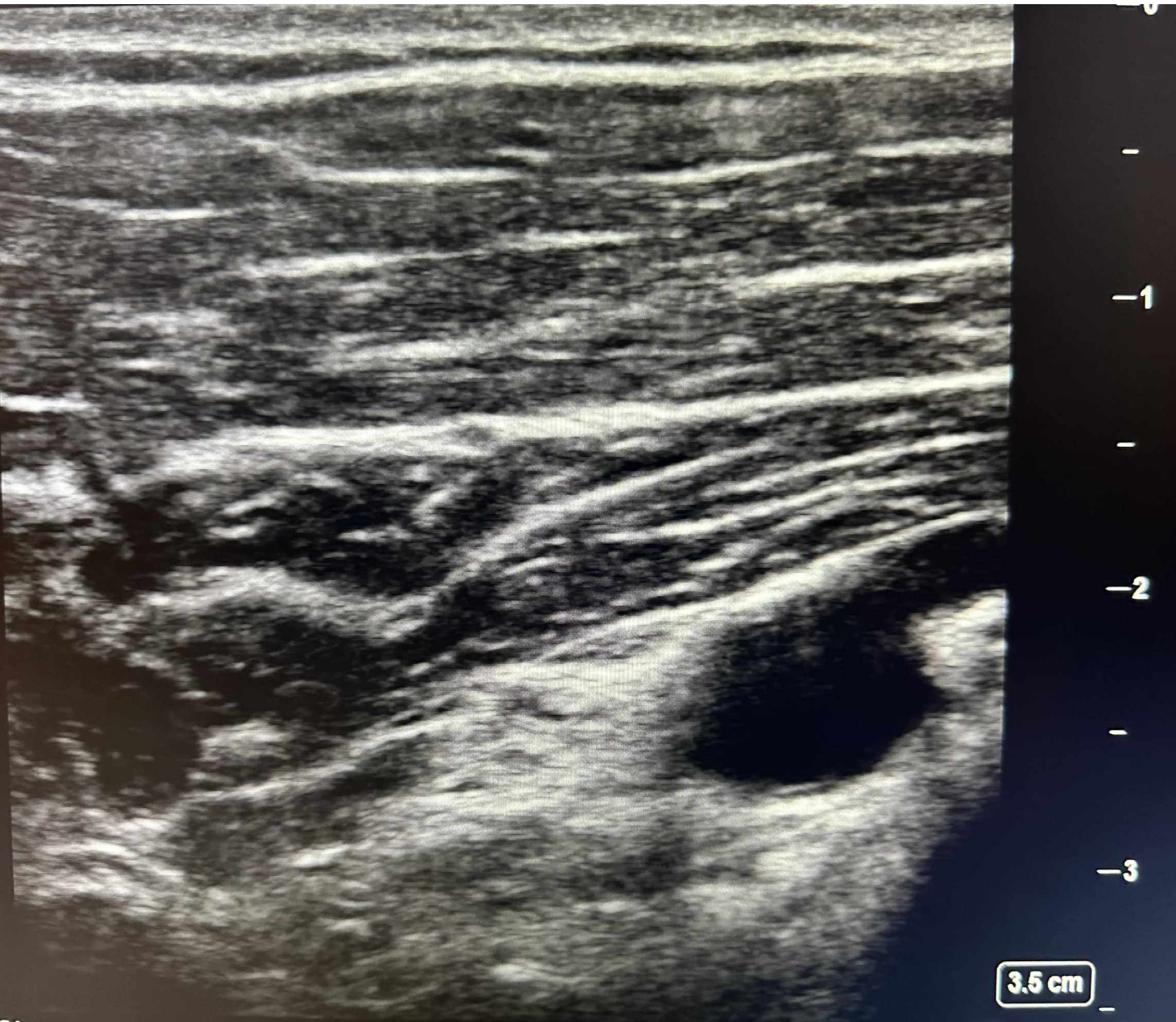
A 93-year-old, 65kg female with a past medical history of asthma, hypertension, hypothyroidism and a right distal humerus fracture s/p right total elbow arthroplasty in 2021 presented with a right periprosthetic distal humerus fracture. Prior to arriving in the holding area, the patient received 975 mg of acetaminophen, 200mg of celecoxib, 300 mg of Gabapentin and 5mg of Oxycodone but was still reporting 10/10 pain.

Procedure: A high frequency linear probe was placed medial to the coracoid process, just below and parallel to the clavicle. The probe was tilted slightly superior to locate the costoclavicular space where the cords were clustered just lateral to the axillary artery. An 18 gauge Tuohy needle was inserted in-plane from lateral to medial through the subclavius muscle and into the paraneural sheath (4cm). After negative aspiration, 20cc of 0.5% Bupivacaine was administered through the Tuohy needle. A 20g multi-orifice catheter was advanced through the needle under continuous ultrasound guidance. An Additional 10cc of 0.5 Bupivacaine was given through the catheter to confirm location in the center of the cords.

- Immediately post procedure: improvement of pain with both movement and palpation.
- 20 minutes post: Complete resolution of pain and complete motor block other than slight deltoid and thumb abduction.
- Intraop: Maintained on 50-60 mcg/kg/min of propofol without need for additional narcotic administration or placement of an advanced airway.
- Postop: Continued to endorse 0/10 pain and was connected to an infusion of 0.2%Ropivacaine at 8ml/hr with PCA bolus of 4ml/hr.
- POD 1-3: Maximum pain score of 0/10. Patient was discharged on POD 3 with catheter in place with the same infusion settings with a pain score of 0/10.
- Follow up: Continued to report 0/10 pain with slight return of motor function during the duration of the catheter infusion. The catheter was removed by the patient on POD 5 without any adverse. The patient remained completely opioid free for the entire postoperative course.



"Nerve Blocks App: Costoclavicular Block." NYSORA, www.nysora.com/nerve-blocks-app-costoclavicular-block/.



References

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Discussion:

Compared to the traditional infraclavicular block

- The cords of the brachial plexus are more superficial and tighter together at the costoclavicular location.
- With the traditional ICBPB, local is deposited in the lateral infraclavicular fossa where the cords are deeper, more spread out, and show considerable variation in location around the axillary artery. This could explain why a catheter placed here might not cover all three cords resulting in a failed secondary block, increased procedure time, and why a larger volume of local anesthetic might be needed for adequate coverage [1].
- CCBPP approach achieves a quicker onset [2]which ideally results in earlier readiness for surgery when used as a primary anesthetic

Compared to the supraclavicular block

- The tight clustering of the cords lateral to the axillary artery in the costoclavicular space provides favorable anatomy, potentially resulting in decreased procedure time [3].
- With similar times to onset, readiness for surgery of the CCBPB is comparable to the supraclavicular block when used as a primary anesthetic [4].
- The incidence of hemidiaphragmatic paralysis is significantly reduced [2]
- When placement of a catheter is desired, the intramuscular CCBPB can help secure the catheter to prevent migration or accidental dislodgement.

The CCBPB has been shown to be non-inferior to other brachial plexus blocks in regard to sensory and motor blockade and despite the potential advantages in certain clinical situations, it remains a relatively novel and rarely used procedure