

INFRACLAVICULAR BLOCK

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1. Indications

Infraclavicular block provides anaesthesia and analgesia for surgery on humerus, elbow, forearm and hand.

2. Contraindications

Local infection

3. Anatomy

In the infraclavicular plane the cords of the brachial plexus surround the axillary artery and lie medial to the coracoid process of the scapula; the lateral cord is cephalad and lateral to the artery, the posterior cord is posterior to the artery, and the middle cord posterior and medial to the artery. The axillary vein lies medial to the artery.

4. Technique

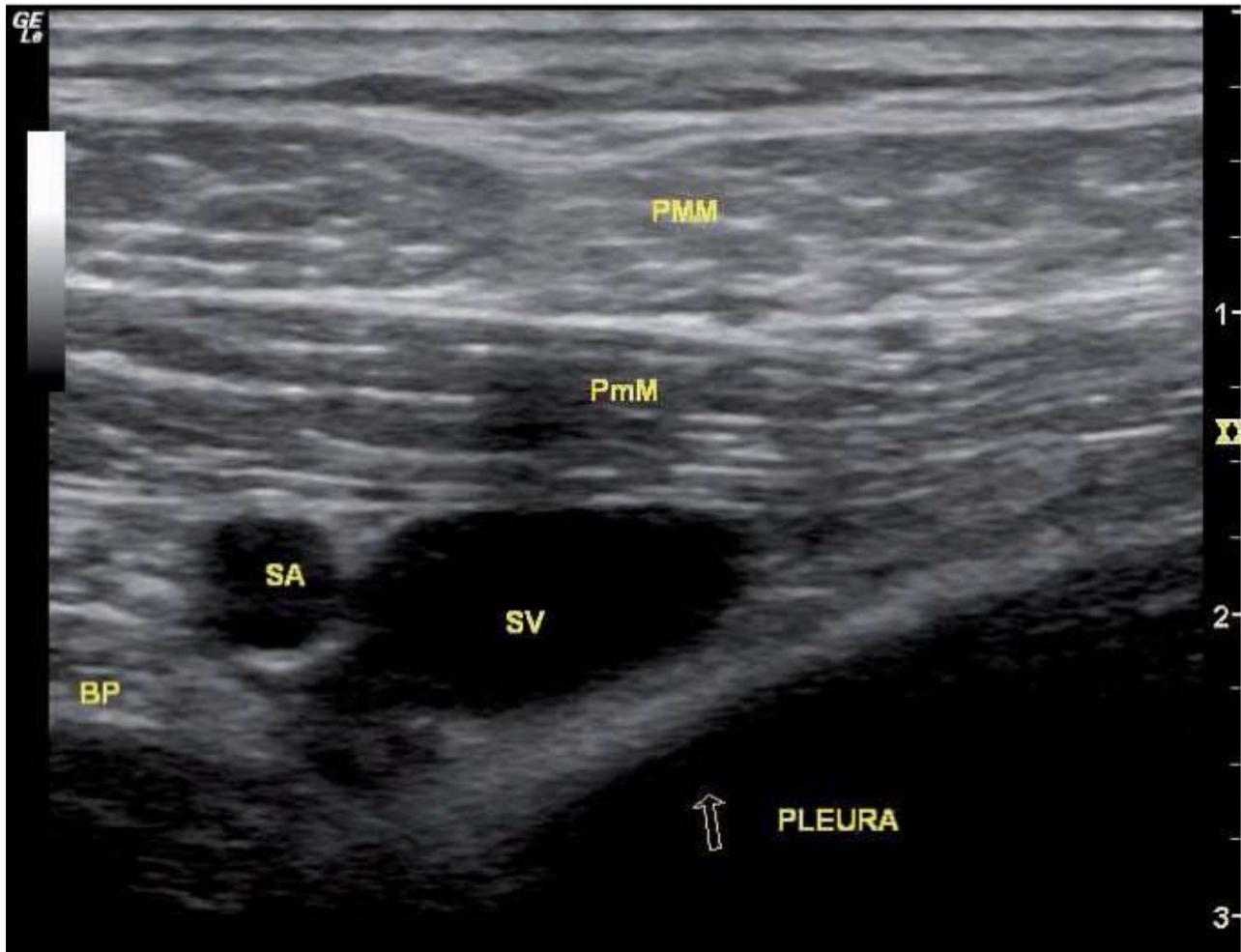
The patient lies supine with shoulders in neutral position and the arm first lying at the side, then abducted and flexed at the elbow.

Use a linear high-frequency probe with 10-12 MHz. For smaller patients, if possible, use a small footprint linear probe (25 mm). If required, identify the nerves using the nerve stimulator: common response to neurostimulator is the forearm and hand contraction.

Place the probe immediately medial to the coracoid process of the scapula below the clavicle in a parasagittal plane so that the plexus can be scanned transversely (the marker on the probe is directed towards the patient's head).

Start scanning the anatomy of the investigation area and identify the superficially located pectoralis major and pectoralis minor muscles - two narrow structures directly under the skin. Then look for the large vessels, axillary artery and axillary vein, both easily identified as hypoechoic structures: the artery is pulsating and the vein is compressible. In this region the acoustic enhancement artifact is often

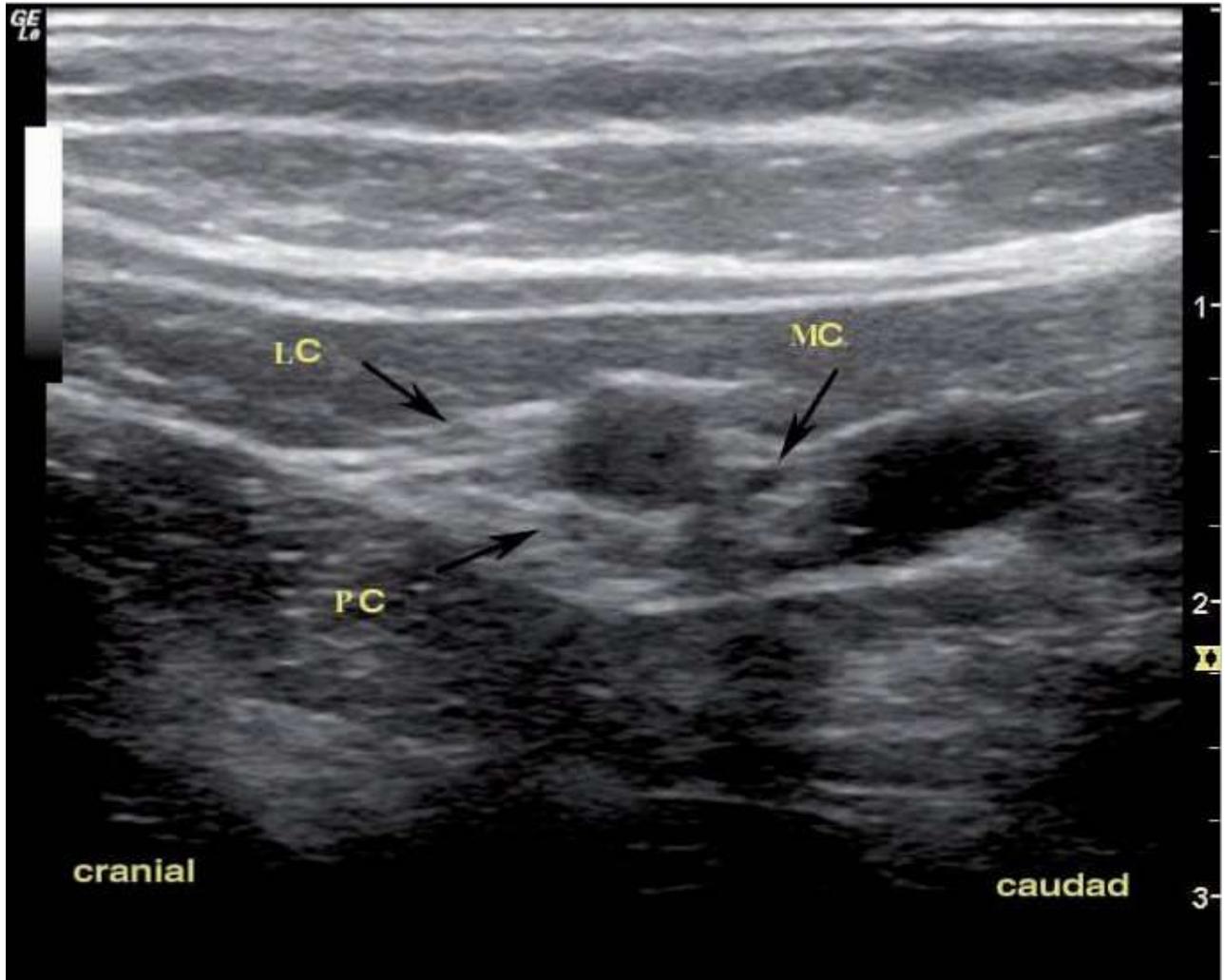
observed caused by the axillary artery. Directly under and medial to the vessels the pleura is identified as a linear hypoechoic structure.



PMM = pectoralis major; PmM = pectoralis minor; SA = subclavian artery; SV = subclavian vein; BP = brachial plexus; arrow = pleura

The plexus cords appear as hypoechoic, slightly round structures surrounding the axillary artery. Usually the lateral and posterior cords are easy to identify; relative to the artery the lateral cord is in 10 o'clock position, the posterior cord is in 6 o'clock position and - if in view - the medial cord is in 3 o'clock position.

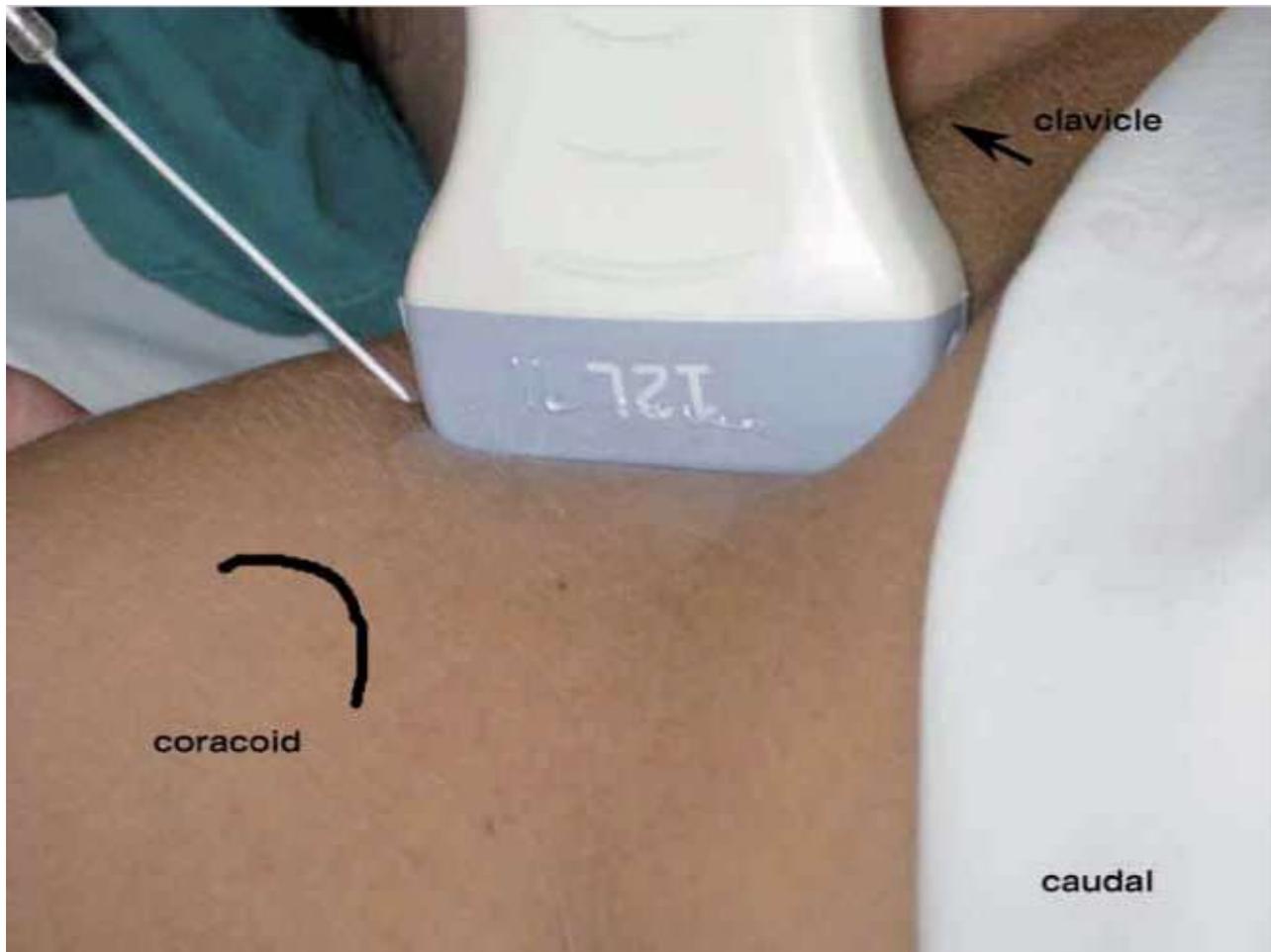
Now the arm is turned outward and abducted so that the plexus cords move closer together laterally or posteriorly to the artery.



LC = lateral cord; PC = posterior cord; MC = medial cord

To perform the block use the in plane approach.

After preparing the investigation area and the sterile probe, introduce the needle along the long axis of the transducer cephalad to caudad in the same plane as the ultrasound beam. Slowly, advance the needle as parallel as possible to the probe keeping the needle tip visible at all times. (Do not insert the needle, if the tip is not clearly visible.) Release transducer pressure before injection to detect axillar artery and vein and decrease the risk of intravenous injection.



Now inject the local anesthetic in fractional volumes while constantly controlling whether it is correctly spread around all nerve roots, the ideal spread is periarterial (U-shaped).

Attention:

If the local anesthetic spreads in front of the artery or directly under the pectoral muscle, it means that the block has failed. In this case the needle must be repositioned to achieve optimal distribution.

5. Volume

Generally 0,5 ml/kg of ropivacaine 0.2% or levobupivacaine 0.25% for a successful block.

6. Complications

Pneumothorax (always check the pleura movements after performing the block)

Vascular puncture and intravascular injection (release transducer pressure before injection to detect axillar artery and vein and decrease the risk of intravenous injection).

7. References

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