

INTERSCALENE BLOCK

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1. Indications

Interscalene block provides anaesthesia and analgesia for surgery on shoulder, distal clavicle and proximal humerus.

2. Contraindications

- Local infection
- This block should not be performed bilaterally because of the potentially respiratory problems originating from the phrenic nerve block, almost always present with this technique even with the ultrasound guide.

3. Anatomy

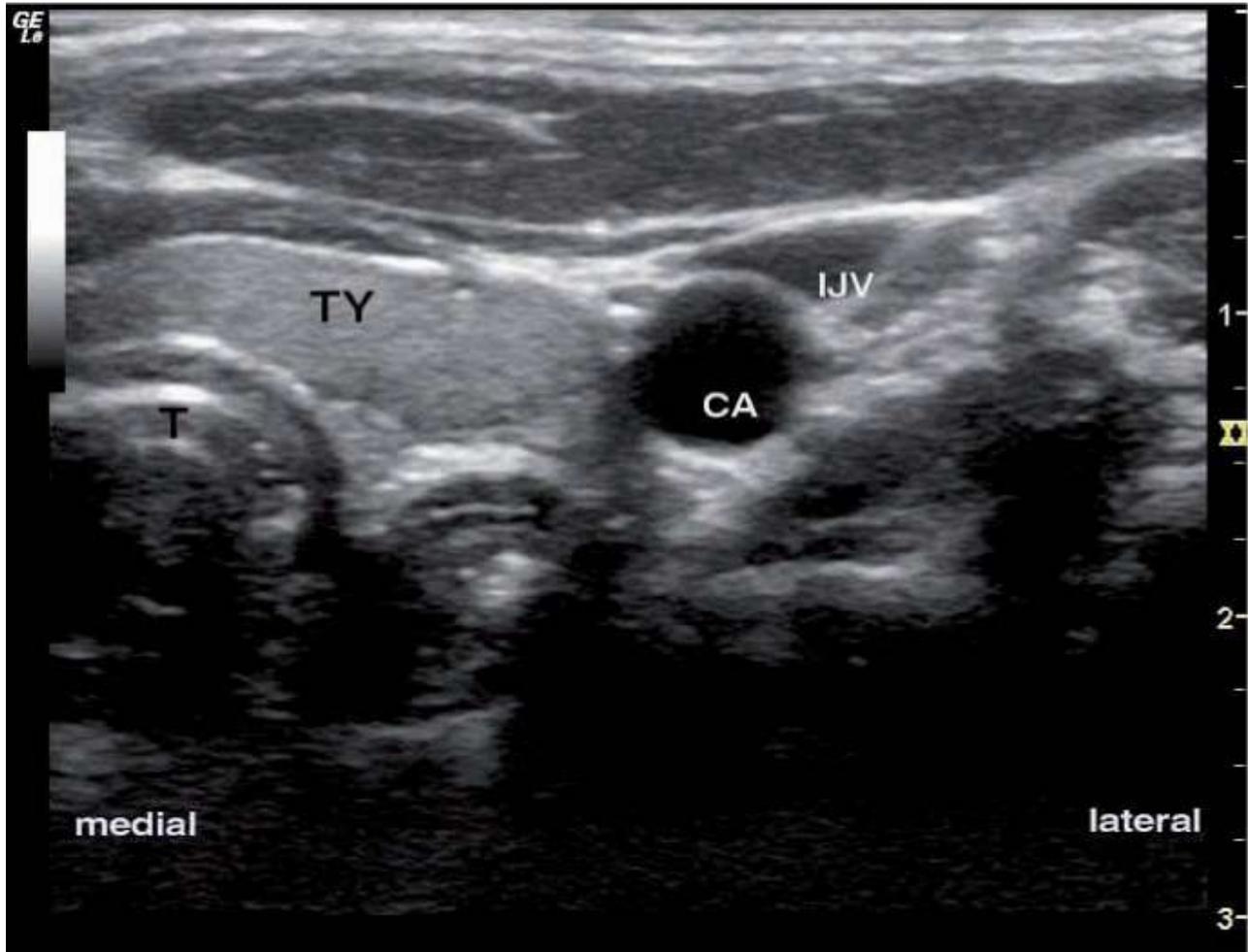
The interscalene roots of the brachial plexus (C5, C6, C7) run in the interscalene groove between the anterior and middle scalene muscles, which are located at the lateral border of the clavicular origin of the sternocleidomastoid muscle.

4. Technique

The patient is in supine position, the head is slightly turned away from the side to be blocked.

Use a linear high-frequency probe with 10 or 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 deltoid contraction.

Place the probe in an axial oblique plane at the neck so that the plexus can be scanned transversely (the marker on the probe is directed towards the patient's right body side). Start by scanning the anatomy of the investigated region, first locating the easily recognisable large vessels, the carotid artery, and the jugular vein.



T= trachea; TY= thyroid gland; CA= carotid artery; IJV= internal jugular vein

Then navigate along the triangular-shaped sternocleidomastoid muscle, which is the uppermost superficial structure. Exactly under the tip of this muscle, the two scalene muscles - anterior and middle scalene muscles - are visualised, slightly round in shape.

The brachial plexus roots lie between the two scalene muscles directly under the tip of the sternocleidomastoid muscle and look like round to oval shaped hypoechoic structures - normally three in number (the roots C5, C6 and C7) and well distinguishable from each other - that descend from the surface into deeper regions lateromedially. The ultrasound image is quite typical and reminds of a butterfly whose wings represent the two scalene muscles while the body represents the plexus roots.

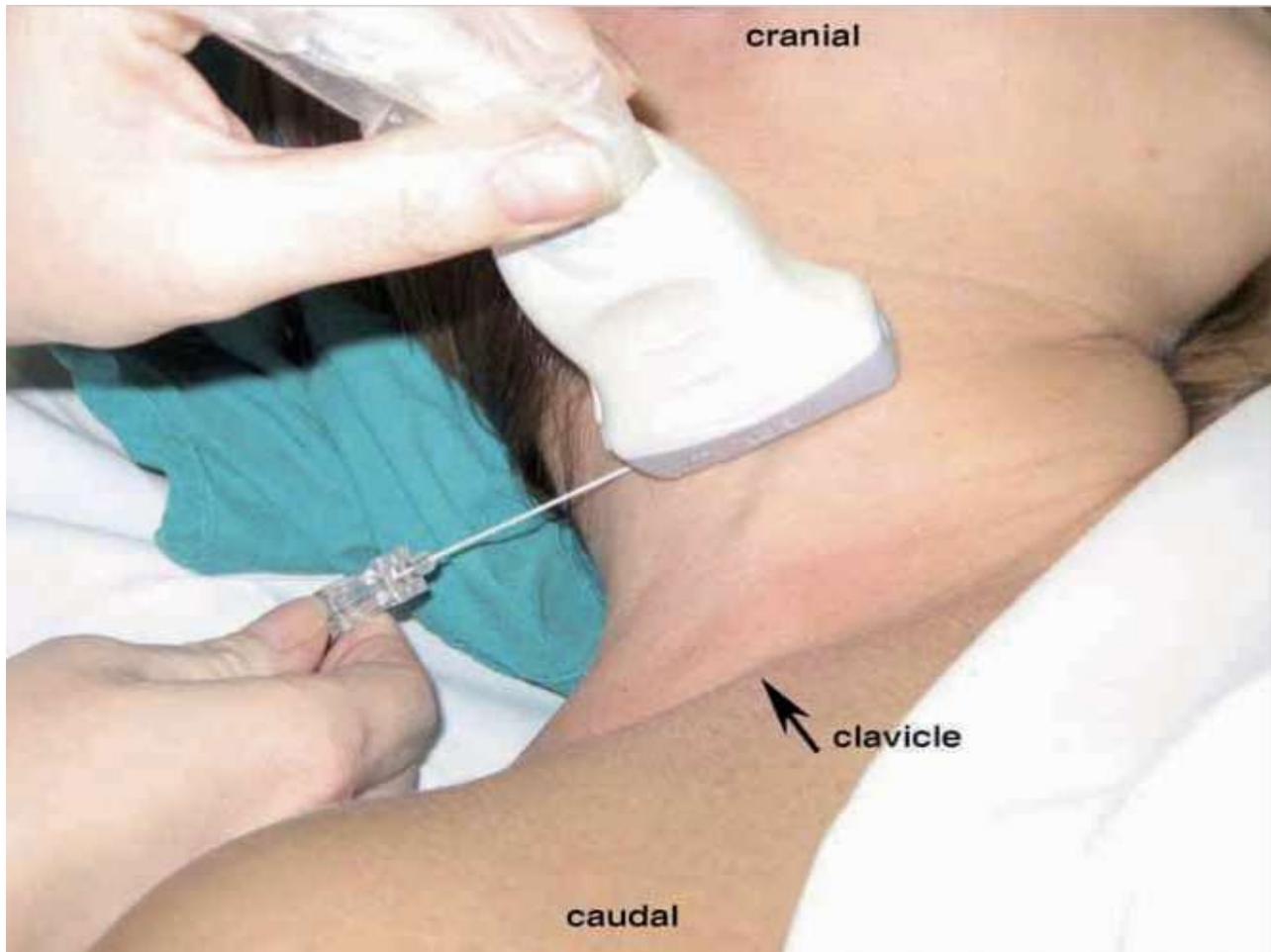
Alternatively, start scanning at the supraclavicular fossa and scan proximally through the neck towards the interscalene groove, until the roots are identified.



SCMM = sternocleidomastoid muscle; ASM= anterior scalene muscle; MSM = medial scalene muscle; arrows= brachial plexus roots

To carry out the block use the in plane approach.

After preparing the investigation area and the sterile probe, introduce the needle lateral to medial along the long axis of the transducer (this is safer, since further away from the large vessels) in the same plane as the ultrasound beam. Slowly, continue to 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.)



Now inject the local anesthetic in fractional volumes while constantly controlling whether it is correctly spread around all nerve roots. The drug is depicted as a hypoechoic zone that gradually encompasses the nerves and dilates the scalene groove. If this is not observed, reposition the needle slightly 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

Phrenic nerve block (less frequent if using a low dose of local anesthetic)

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

Horner's Syndrome (less frequent if using a low dose of local anesthetic)

Vascular puncture and intravascular injection (be careful to the vertebral artery at C7 level).

7. References

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