

Supraclavicular Block

Following the brachial plexus inferiorly from the interscalene groove the ultrasound probe lies posterior to the clavicle and pointed infero-medially. The subclavian artery is seen in short axis, readily identifiable by its rounded shape, pulsatility and if necessary colour Doppler.

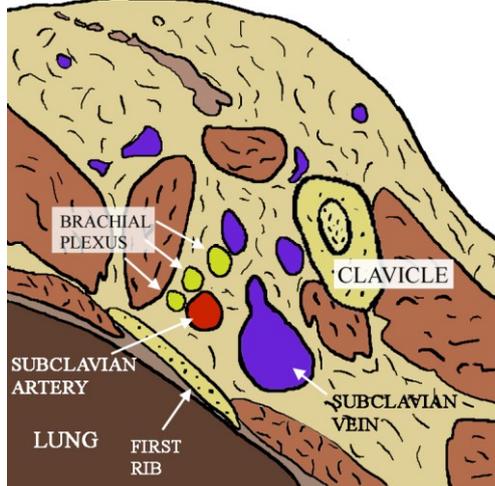


Fig 2.11 Diagram of vertical section through the supraclavicular brachial plexus

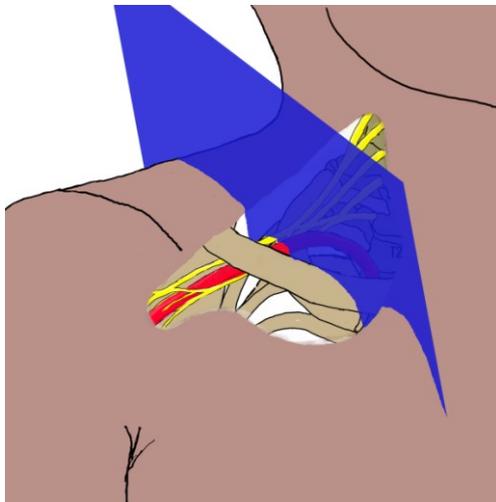


Fig 2.12 Plane of ultrasound imaging perpendicular to the supraclavicular brachial plexus.

The subclavian vein lies anterior. The trunks and divisions of the brachial plexus are positioned close together and usually postero-superior to the artery. Occasionally some divisions may lie inferior to the artery. The sonographic appearance is of multiple bright rings with

black centres, this has been likened to a bunch of grapes. An important variant is the presence of a dorsal scapular artery or vein which passes through the brachial plexus at the supraclavicular level.

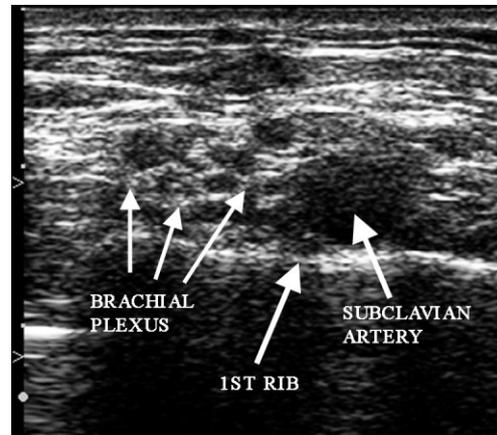


Fig 2.13 Sonogram of the supraclavicular brachial plexus, a 'bunch of grapes' posterior to the subclavian artery

The brachial plexus at this level is able to be approached from above, from behind or from in front. The classical approach from above can be assisted by ultrasound, introducing the needle across the plane of the beam. This may however lead to some depth ambiguity about the needle tip. As the major complication of this block is pleural puncture and pneumothorax, accurate identification of the tip is necessary to fully exploit the safety of ultrasound guidance.

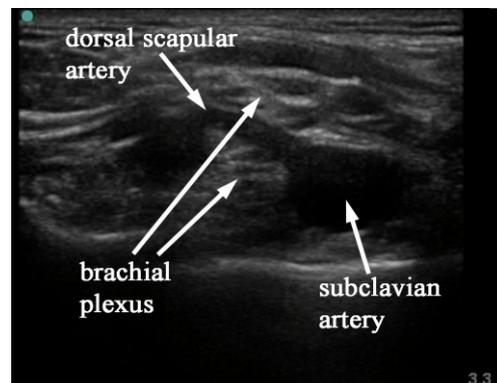


Fig 2.14 Sonogram of variant dorsal scapular artery passing through supraclavicular brachial plexus.

Ultrasound Guided Procedures in Anaesthesia

Hebbard, Barrington & Royse

www.heartweb.com.au

The block may also be performed with a perpendicular approach with the needle insertion point posterior to the clavicle. The approach may also be parallel to the length of the clavicle which may be more convenient. Positioning the patient on the contra-lateral side may also be preferred. As the pleura rises superiorly behind the subclavian artery this should be imaged before posterior needle insertion. The needle insertion point is 20 to 30 mm posterior to the ultrasound probe. It is advanced subcutaneously and the probe moved posteriorly until the needle is seen as a perpendicular bar in the image.

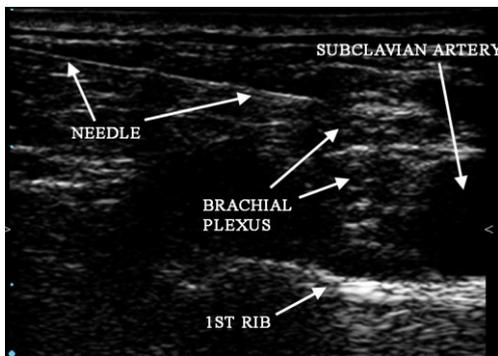


Fig 2.15 Sonogram of needle approaching supraclavicular brachial plexus, perpendicular posterior in plane approach



Fig 2.16 Position of needle and probe for posterior in plane perpendicular approach to supraclavicular block. In larger subjects a 100 mm needle and

lateral positioning of the patient (to give room for the needle) may be needed.

The needle is then advanced under continuous vision to be positioned within the sheath surrounding the nerves. The tightness of the sheath at this level seems to lead to a high incidence of paraesthesia. It does however seem to be important for a good block to place local anaesthetic inside the fascial sheath covering the plexus which is otherwise a substantial barrier to diffusion. 20 to 25 ml of 0.75 to 1% ropivacaine or 2% lignocaine with adrenaline is effective. Imaging is continued during injection of local anaesthetic to check for correct deposition. The angle between rib and subclavian artery is the ideal place to deposit local anaesthetic

The approach from anterior, starts between the probe and the clavicle, in the plane of the beam. The needle is passed in plane under the probe to lie in the plexus sheath superior to the artery. Some ulnar sparing may be more likely with this approach as the lower nerve divisions may be inferior to the artery and relatively inaccessible. In describing this ultrasound guided procedure it has been assumed that attention has been paid to appropriate location, personnel, sterility, preparation, doses and technique necessary for the safe conduct of major nerve blocks and other procedures. These medical procedures should not be attempted without suitable qualifications

Acknowledgements

Thanks go to the Ecole Polytechnique Federale de Lausanne for the excellent anatomical slices that can be obtained from the data set of the Visible Human Project via their website at

<http://visiblehuman.epfl.ch/>