

Serratus Plane Block, Catheter Insertion & Infusion: Technique & Tips

INDICATIONS IN CHEST TRAUMA

- Flail segment or multiple fractured ribs with pain not managed well by standard analgesic ladder & opioids.
- Hypoventilation / poor cough and inability to comply with chest physiotherapy.
- Lung contusion or consolidation with impending respiratory impairment.
- Where pre-existing respiratory co-morbidities or frailty compound the risk of respiratory failure.

EQUIPMENT

- Skin Prep.
- Sterile dressing pack with window drape.
- 10cm Tuohy & peripheral nerve catheter set (*can use epidural Tuohy kit if peripheral catheter set unavailable*).
- Saline and Local Anaesthetic (LA - 30mls 0.25% [levo]bupivacaine).
- Surgical glue / 'Lockit' catheter dressing / clear film dressing & Hypafix/Mefix window (*the glue is invaluable for reducing leaks & dislodgement*).

LOCAL ANAESTHETIC (*Bolus and Infusion dose listed here equates to 363mg [levo]bupivacaine over a 24hour period*).

- **Initial bolus:** 30mls of 0.25% bupivacaine (equivalent to approx. 1mg/kg)
- **Infusion:** 6 - 8mls / hour of 0.15% plain bupivacaine (equivalent to approx. 0.15mg/kg/hr)

POSITIONING

- Supine or slightly head up. Arm abducted to allow access to axilla 'safe triangle' (*as per chest drain landmarks*).
- This block can be done with the patient sitting [akin to epidural insertion] with posterior-anterior needling employed.

TECHNIQUE

(Document Pre & Post pain scores from 0 - 10. Note patient's best score within first 30 minutes following initial bolus)

1. Informed consent (*complete a form if this is a 'stand-alone' block not linked to anaesthesia for surgery*).
2. IV access, SpO₂, ECG, NIBP and supplemental oxygen as required.
3. Full sterile PPE with probe cover and window drape over site (*it is helpful to do a preliminary scan to optimize approach & identify surface landmark before prepping and positioning the sticky window drape*).
4. Long axis of probe in AP orientation. Mid-axillary line. Nipple level (ribs 4-5).
5. Slide probe posteriorly until wedge of Latissimus appears over serratus (*see ultrasound image*).
6. Angle/rotate probe to optimise image as required.
7. 1% lignocaine to skin and subcutaneous tissues.
8. Tuohy in plane: Anterior to Posterior
9. Insert needle between latissimus dorsae & serratus muscles* (*carefully avoid any vessels, such as the lateral thoracic artery; they often accompany nerves i.e. Long thoracic*).
10. Hydro-dissect and locate the plane with saline. Follow with bolus of LA to further open up the space.
11. Insert catheter. Aim to leave at least 5 - 10cm inside the space (*this can be a loose & mobile area of anatomy*).
12. Visualise catheter and check with remaining injectate.
13. Glue. Lockit. Clear dressing. Mefix/Hypafix window.

* LA can be infiltrated in the plane **beneath** serratus by inserting the needle down onto the rib, using it as a safety barrier to the pleura, and infiltrating here. This technique offers comparable analgesia and may be easier to maintain needle tip position relative to the tissue planes when pressure is released from the US probe, freeing up a hand to insert the catheter.

NB: depending upon the type of needle/catheter used, the insertion technique may vary from brand to brand i.e. if a *catheter-over-needle* kit be employed, adjust the technique accordingly.

INFUSION

- Connect catheter filter to **Bodyguard infusion device** at a rate of 6 - 8mls/hr or **Elastomeric Pump**.
- **Monitor for 20 minutes post block.** Complete infusion prescription and pain team audit paperwork in recovery.
- Catheter can remain in situ for up to 14 days, with regular pain team review and assuming no red flags.
- This block can be performed bilaterally but take care to halve your infusion's concentration.

SONO-ANATOMY: SHOWING SUPERFICIAL & DEEP PLANE NEEDLING (PLAIN IMAGE INCLUDED)

- From an anatomical point of view this is a relatively low risk block to perform. Beware of the pleura, neurovascular bundles and adjust your doses accordingly for extremes of body mass.
- If a catheter is difficult to thread, the injection of a single bolus will afford good analgesia until a catheter can be re-attempted if appropriate.
- When indicated, insertion of a chest drain should of course trump the placement of an anaesthetic catheter in the acute setting. However a chest drain already in situ is not an absolute contraindication to LA catheter placement.
- Needle and catheter insertion can be more superior or inferior depending on injury and presence of chest drains. The technicalities of which should be addressed on a case by case basis.

