

Paravertebral Block

INDICATIONS:

- Breast surgery, pain management after thoracic surgery (post thoracotomy pain) or rib fractures
- Mastectomy T2-T6
- Radical Mastectomy with lymph node dissection requires T1-T6
- Can be used for thoracic, abdominal or pelvic procedures
- May also be useful in diagnosing chronic pain disorders: post mastectomy and post thoracotomy pain)

CONTRAINDICATIONS:

ABSOLUTE

- patient refusal

RELATIVE

- Infection at the site
- coagulopathy
- local anesthetic allergy
- uncooperative patients
- lack of resuscitative equipment
- pre-existing neuropathy is relative

ANATOMY

- Thoracic paravertebral space is continuous, with the intercostal space laterally, epidural space medially, and the contralateral paravertebral space via the prevertebral fascia
- **LANDMARKS**
 - Spinous processes (midline)
 - Tips of scapulae (corresponds to T7)
 - Paramedial line 2.5 cm lateral to the midline, 2cm for small women



EQUIPMENT

- 10-cm long, 22-gauge Tuohy needle
- Sterile extension tubing
- 25G 1.5" needle with control syringe (lidocaine for skin infiltration)

DRUGS

- 0.5% ropivacaine with 1:200 000 epinephrine

PROCEDURE

- Identify spinous processes consistent with level of desired block and mark them with marking pen (in the thoracic spine the spinous process of T5 corresponds to the transverse process of T6, therefore must go one spinous process above the desired level; the T5 nerve root passes inferior to the T5 transverse process)
- Infiltrate skin 2-2.5cm lateral to each level desired with 2% lidocaine
- With 22G touhy needle at 2-2.5cm lateral to spinous process contact the transverse process of the individual vertebrae and note the depth at which the process was contacted (usually 2-4 cm)
- Withdraw needle to the skin level and reinsert at a 10o degree caudal needle angulation, avoid medial direction
- Walk off the transverse process 1 cm deeper to the transverse process and have assistant inject 4-5 mL of local anesthetic after negative aspiration (syringe should be attached to touhy needle via sterile extension tubing)
- A single level injection of 10-15ml will give you a 4 dermatome spread

ALTERNATE TECHNIQUE (MILLER 7TH EDITION)

Thoracic Paravertebral Block

Thoracic **paravertebral** blockade occurs at the point where the spinal nerves emerge from the vertebral foramina. This results in somatic and sympathetic blockade of multiple contiguous thoracic dermatomes above and below the injection site.

A thoracic **paravertebral block** can be performed with the patient in the sitting, lateral, or prone position; the sitting position allows easy identification of landmarks. The thoracic spinous processes are identified, and the needle is inserted 2.5 to 3 cm lateral to the most cephalad aspect of the spinous process and advanced perpendicular to the skin in all planes to contact the transverse process of the vertebra below, typically at a depth of 2 to 4 cm. After the transverse process is identified, traditionally the needle is redirected cephalad and gradually advanced until loss of resistance is felt 1 to 1.5 cm past the superior edge. However, walking the needle caudad may decrease the risk for pneumothorax.^[90]

Although spread of local anesthetic is variable, a single injection of 15 mL produces unilateral somatic blockade over four or five dermatomes; there is a tendency for caudad (versus cephalad) spread.^[90] To achieve greater spread, 3 to 4 mL of local anesthetic may be injected at each segment.^[92]

Lumbar Paravertebral Block

Lumbar nerves exit the vertebral foramina inferior to the caudad edge of the transverse process. Each nerve divides into anterior and posterior branches; the anterior branches of L1 through L4 (with a contribution from T12) form the lumbar plexus.

The patient is placed in the prone position as described for intercostal blockade. Lines are drawn across the cephalad edges of the lumbar vertebral spinous processes. These lines lie opposite the caudad edges of the homologous transverse processes (see Fig. 52-14A). A skin wheal is raised 3 cm lateral to the midline, and a 20-gauge, 8-cm needle is advanced perpendicularly until it contacts the transverse process at a depth of 3 to 5 cm. The needle is then redirected to walk off the caudad edge of the transverse process. At 1 to 2 cm (the thickness of the transverse process) beyond this point, 6 to 10 mL of local anesthetic is injected (see Fig. 52-14B). Elicitation of a paresthesia or the use of a nerve stimulator is helpful in confirming correct needle placement.

Complications

Because of proximity of the neuraxis, epidural or subarachnoid injection of local anesthetic is a risk. Intravascular injection through the lumbar vessels, vena cava, or aorta is possible. Pleural puncture and pneumothorax have occurred at frequencies of 1.1% and 0.5%, respectively

- Hematoma
- Pnuemothorax
- Spinal anesthesia
- Local anesthesia toxicity
- Paravertebral muscle pain

REFERENCES:

- NYSORA.com
- Miller Anesthesia 7th Edition Chapter 52