TRUNCAL BLOCKS

Sarah Tweedy DNP, CRNA, ARNP
I have no conflicts of interest and nothing to declare
OUTLINE

- Review anatomy/physiology, ultrasound imaging, indications, contraindications, and complications for the following truncal blocks:
  - TAP Block (Midaxillary & Subcostal approaches)
  - Quadratus Lumborum
  - Ilioinguinal/Iliohypogastric Block
  - Rectus Sheath Block
  - PECS 1, 2, and Serratus Plane Block
  - Erector Spinae
TAP BLOCK ANATOMY
TAP BLOCK ANATOMY
TAP BLOCK ANATOMY

Transversus Abdominis

Internal Oblique (IO)

External Oblique (EO)

Nerves in TAP
PATIENT POSITION - MIDAXILLARY

- Supine position
- Arm extended or lowered to allow access to abdomen at the mid-axillary level
- Identify Iliac crest and costal margin
- Probe placement in a longitudinal position in space between IC and CM at the mid-axillary level
ULTRASOUND ANATOMY - MIDAXILLARY
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PATIENT POSITION - SUBCOSTAL

- Starting from mid-axillary probe position
- Advance probe inferior to costal margin in oblique position
- Identify rectus muscle, transversus abdominis
INDICATIONS

- Any surgery involving the anterior abdominal wall
  - Laparotomy
  - Abdominal laparoscopic procedures
  - Hernia repair with component separation
  - Cesarean section
EQUIPMENT

- U/S with linear or curvilinear probe depending on patient size
- 4 in. 22 gauge block needle
- Syringe containing LA, syringe containing PF 0.9% NS, 3-way stopcock
  - NS used for hydrodissection (~2mL in rapid fashion)
  - Usually use 20-30mL LA/side
COMPLICATIONS

- Infection and bleeding
- Allergic reaction
- Intravascular injection
- Peritoneal puncture
- Bowel laceration/puncture
- Liver laceration
- LAST

*Neurologic injury has never been documented*

*Risks are relatively low and are the same for QL, II/IH, & rectus sheath blocks*
QUADRATUS LUMBORUM BLOCK ANATOMY

Quadratus Lumborum Block

- Latissimus dorsi m.
- Subcostal n. (T12)
- Transversus abdominis m.
- Internal oblique m.
- External oblique m.
- Transversalis fascia
- Peritoneum
- Iliohypogastric n.
- Ilioinguinal n.
- Quadratus lumborum m.
- Erector spinae m.
- Transverse process
- Psoas major m.
- Posterior thoracolumbar fascia
- Middle thoracolumbar fascia
- Anterior thoracolumbar fascia
- L3-4 intervertebral disc

Diagram Image
PATIENT POSITION

- Patient is placed in lateral decubitus position
  - Block side will be uppermost
- Provider stands behind patient while others assist with maintaining patient’s position
ULTRASOUND ANATOMY

- US transducer placed between costal margin and iliac crest and mid-axillary line
- Anterior: will see the TAM, EOM, and IOM start to taper off (IOM & EOM may be visible); slide posterior until lateral edge of TP as well as PM & ES are identified (QL attached to TP)

QL: quadratus lumborum; PM: psoas major; PSM: paraspinal muscle (erector spinae); TP: transverse process; VB: vertebral body
ULTRASOUND ANATOMY, CONTINUED

- QL1: Needle tip where TAM tapers laterally at lateral aspect of QL; LA spreads along anterior surface of QL

- QL2: Needle between posterior (dorsal) surface of QL and the thoracolumbar fascia enveloping QL; LA spreads along posterior surface

- QL3: (Also known as transmuscular injection) occurs between the anterior surface of QL and Psoas Major; LA spreads along the anterior surface of QL
INDICATIONS

- Colorectal Surgery
- Laparoscopic Nephrectomy
- Percutaneous Nephrolithotomy
- Laparoscopic Cholecystectomy
- Thoracoscopy/Thoracotomy
- Cesarean Section
- Laparotomy (Midline Incision)
- More extensive laparoscopic procedures (hysterectomy, hemicolectomy, bilateral salpingo-oophorectomy)
  - Major gynecologic surgery is associated with a large component of visceral pain
EQUIPMENT

- Curvilinear probe (low frequency) may work best, depending on patient’s body habitus
- 4 in. 22 gauge block needle
- Syringe containing LA, syringe containing PF 0.9% NS, 3-way stopcock
  - NS used for hydrodissection (~2mL in rapid fashion)
  - Usually use 30mL LA/side
ILIOPUINAL/ILIOPHYPOGASTRIC BLOCK ANATOMY
PATIENT POSITION

- Identify ASIS
- Position probe immediately superior and medial to ASIS in an oblique position
ULTRASOUND ANATOMY
ULTRASOUND ANATOMY

Be careful of small blood vessels!
INDICATIONS

- Ideal for inguinal hernia repair or suprapubic incisions
  - Analgesia to skin, muscles and parietal peritoneum *not visceral
  - Can provide pain management for open or laparoscopic inguinal hernia repairs
EQUIPMENT

- U/S with high, mid or low frequency probe
  - Dependent upon patient size
- 4 in. 22 gauge block needle
- Syringe containing LA, separate syringe containing PF 0.9% NS, 3-way stopcock
  - NS used for hydrodissection (~2mL in rapid fashion)
  - Usually use 20mL LA/side
RECTUS SHEATH BLOCK ANATOMY

Rectus Sheath Blocks

- Mid-axillary line
- Anterior axillary line
- Mid-clavicular line
- Anterior rectus sheath (cut)
- Posterior rectus sheath
- Transversus abdominis m.
  - Internal oblique m. (cut)
  - External oblique m. (cut)
- Rectus abdominis m. (cut)
- Iliohypogastric n.
- Iliinguinal n.
- External oblique aponeurosis (cut)
- Transversalis fascia
- Internal oblique aponeurosis (cut)
- Lateral cutaneous branches of thoracoabdominal nn. (T6-T12)
- Anterior cutaneous branches of thoracoabdominal nn. (T6-T12)
- External oblique m. and aponeurosis
- Transversalis fascia
- Posterior rectus sheath
- TAM
- RAM
- Lateral
PATIENT POSITION

- Ultrasound midline in a transverse orientation
- Identify linea alba and advance probe lateral to identify rectus sheath muscle
ULTRASOUND ANATOMY
ULTRASOUND ANATOMY
INDICATIONS

- Somatic but not visceral pain relief
- Appropriate for midline abdominal incisions
- Can be used in both pediatric and adult populations
  - Umbilical hernia repair
  - Pyloromyotomy
  - Midline laparoscopy
  - Duodenal atresia repair
EQUIPMENT

- U/S with high, mid or low frequency probe
  - Dependent upon patient size
- 4 in. 22 gauge block needle
- Syringe containing LA, separate syringe containing PF 0.9% NS, 3-way stopcock
  - NS used for hydrodissection (~2mL in rapid fashion)
  - Usually use 10-15mL LA/side
PECS I, II & SERRATUS PLANE BLOCK ANATOMY
PATIENT POSITION - PECS I & II

- Supine or semi-recumbent with head turned away from the side being blocked
- Arm abducted 30-90 degrees
- US is initially placed inferior to clavicle and medial to coracoid process, identify 2\textsuperscript{nd} rib lying inferior to axillary artery & vein, slide transducer inferior to 3\textsuperscript{rd}/4\textsuperscript{th} ribs, rotate transducer 30-45 degrees & slide laterally toward axilla
ULTRASOUND – PECS I & II

- **PECS I**
  - Block needle inserted medial to lateral
  - Confirm needle placement in fascial plane between pec major and minor
- **PECS II**
  - Block needle inserted medial to lateral
  - Confirm needle placement in the fascial plane between pec minor & serratus anterior
PATIENT POSITION – SERRATUS PLANE

- Supine or semi-recumbent with head turned away from the side being blocked (can also be lateral)
- Arm abducted 30-90 degrees
- US is placed along the mid-axillary line at the level of 4th or 5th rib (latissimus dorsi identified lying over serratus)
ULTRASOUND – SERRATUS PLANE

- Serratus Plane
  - Block needle inserted caudad to cephalad
  - Confirm needle tip is within the fascial plane between the latissimus dorsi and serratus anterior muscles
  - NYSORA recommends this plane or the plane below serratus
INDICATIONS

- **PECS 1**
  - Surgeries involving most superficial muscle layers
  - Breast expander
  - Subpectoral prosthesis insertion
  - Pacemaker

- **PECS 2**
  - More invasive breast surgeries
  - Radical mastectomy
  - Deep lumpectomy
  - Sentinel and axillary lymph node dissection

- **Serratus Plane**
  - Lateral thorax procedures
  - Latissimus dorsi flap reconstruction
  - Thoracotomy
  - Rib fractures
EQUIPMENT

- U/S with high or mid frequency probe
- 4 in. 22 gauge block needle
- Syringe containing LA, separate syringe containing PF 0.9% NS, 3-way stopcock
  - NS used for hydrodissection
  - Usually use 10mL LA for PECS I; 20mL LA for PECS II; 20-30mL LA for SP
COMPLICATIONS

- Infection and bleeding
- Allergic reaction
- Intravascular injection
- LAST
- Nerve injury (long thoracic, thoracodorsal)
- Pleural puncture
- Pneumothorax
ERECTOR SPINAЕ BLOCK ANATOMY

- Blocks dorsal and ventral ramus providing somatic pain relief, may also block sympathetic chain providing visceral pain relief
- May be blocked at T5 or T8 depending on coverage needed
- Inferior angle of scapula = T7 (used to locate T5 or T8)
  - At T8 rhomboid muscle will be tapered off
PATIENT POSITION

- Per patient comfort: can be sitting, lateral or prone
- US transducer is placed 2-3 cm lateral to the spinous process
- Cephalad to caudad approach for block needle
ULTRASOUND ANATOMY

- Provider will insert needle until transverse process is contacted, then back off slightly
- 1-2 mL NS will confirm tip placement
- Erector spinae should begin to hydrodissect away from TP as local anesthetic is injection

TM: Trapezius, RM: rhomboid major, ES: erector spinae
INDICATIONS

- When performed at T5:
  - Bariatric surgery
  - Rib fracture
  - Thoracic procedures (VATS)
  - Breast surgery
  - Neuropathic pain

- When performed at T8:
  - Abdominal surgical procedure
  - Lower rib fractures
EQUIPMENT

- U/S with high or mid frequency probe
- 2 or 4 in. 22 gauge block needle
- Syringe containing LA, separate syringe containing PF 0.9% NS, 3-way stopcock
  - NS used for hydrodissection
  - Usually use 20-30mL LA/side
COMPLICATIONS

- Infection and bleeding
- Allergic reaction
- Intravascular injection (unlikely in this space)
- LAST
- Relatively safe overall
YOUR QUESTIONS

GIVE THEM TO ME NOW
REFERENCES