Introduction to Regional Anesthesia
Part 1
Ultrasound Guided Nerve Blocks for Dummies
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Why Nerve Blocks?

• Compared to Procedural Sedation:
  – Fewer adverse effects
  – Minimal monitoring
  – Less staffing
  – Provides prolonged post-procedure analgesia
    • Reduced post-procedure narcotic use
  – Most peripheral blocks easy to learn

• Far more effective than ortho sedation
  – “SHHHHHHHHH. Almost done!”
Indications

• Procedures:
  – Fracture reduction
  – Complex suturing
  – Fracture Reduction
  – Dislocation Reduction

• Burns

• Amputations
Contraindications

- Patient refusal
- Allergy to local
- Coagulopathy
  - (Esp. femoral or brachial plexus)
- Any concern over compartment syndrome
- Infection at injection site
Nerve anatomy

- Epineurium – outer sheath
- Perineurium – bright white
- Nerves – high water content
  - Honeycomb appearance
Localization

- High Frequency Probe
- Nerve in cross section
- Know the anatomy
- In plane approach
  - Can watch needle entire way
- Two person procedure
  - Probe and needle
  - Syringe
- Semi-sterile procedure
  - Tegaderm / Skin Prep / Gloves
Needle selection

- Prefer spinal or block needle
- Tubing connects to syringe
- Needle size
  - 25-27 gauge adequate for peripheral
  - 22 gauge for proximal
Injection

- Smaller/distal nerves
  - Inject around epineurium
  - Adequate diffusion

- Proximal nerves (ie Femoral/BP)
  - Penetrate epineurium

- ASPIRATE!

- Inject adequate volume

- Inject a little adjacent to nerve
  - Gives tip room to move
  - Inject below and above

- Goal is to surround nerve
  - Same fascial plane
  - Circumferential spread
Anesthetic choice

• Short term procedures
  – Lidocaine usually adequate
    • Use higher concentrations (2%)
    • No epi!

• Longer procedures/post-procedure analgesia
  – Marcaine
  – No epi
  – Intraneural injections – Inc complications

• Don’t be shy (as long as aspirated!)
“Basic Blocks” (today)

- Posterior Tibial
- Popliteal (Sciatic)
- Forearm/Hand (Ulnar/Median/Radial)
- Next time:
  - Femoral
  - Brachial Plexus (Interscalene and Supraclavicular)
Posterior Tibial

- Blocks 95% of plantar foot
Posterior Tibial

- **Anatomy:**
  - Find medial malleolus
  - Find posterior tibial artery
  - Nerve is adjacent/posterior
  - Follow proximally 2 cm
  - Note tendons
    (Have pt wiggle toes)
Posterior Tibial

- Patient supine or lateral decubitus
- Find medial mall, vessel, nerve
- Follow nerve
- Insert needle
- ASPIRATE!
- Inject
Posterior Tibial Video

Lateral Decubitus Position Ankle Block (In Plane Approach) | Ultrasound for Regional Anesthesia
Sciatic (Popliteal) Nerve Block

- **Indications:**
  - Anesthesia of:
    - Distal Tibia
    - Distal Fibula
    - Ankle and Foot
  - Careful if compartment syndrome!
Sciatic (Popliteal) Nerve Block

- Performed superior popliteal fossa
- Above bifurcation of Common Peroneal and Tibial Nerve
Popliteal Block

Popliteal Block: Distribution of Anesthesia

- Lateral Sural Cutaneous
- Superficial Peroneal
- Deep peroneal
- Saphenous
- Saphenous
- Sural
- Sural
- Superficial Peroneal
- Medial Plantar
Anatomy
Nerve location

• Select the appropriate depth: 2-5 cm
• Identify Femur
• Identify pulsatile popliteal artery (go distal if need to)
• Transverse view of sciatic nerve (higher than think)
  – Commonly hyperechoic in this region
  – Lateral to the popliteal artery
  – Angle transducer caudally to enhance nerve
• Scan proximal / distal
  – Find split into peroneal / tibial
• Aim to block before division
Sciatic Pictures/Anatomy
Sciatic nerve split

http://www.usra.ca/pop4_vid
Popliteal Sciatic Block

- Sonicnerveblock.com - Ultrasound Guided Regional Anesthesia and Ultrasound Guided Peripheral Nerve Blocks
Forearm Block

- 3 nerves
  - Ulnar
  - Median
  - Radial

- Excellent for hand/wrist anesthesia
- Good at distal forearm anesthesia
  - Incomplete block - add hematoma block
Forearm Block
Forearm Block
Ulnar Nerve

- Start distally at wrist
- Identify ulnar n. and a. (n. medial to a.)
- Follow ulnar n. proximal until splits
- Higher better
Ulnar nerve

- Following ulnar nerve distal to proximal

http://www.usra.ca/ulnar_vid
Median Nerve

- Start at wrist or
- Move radially from ulnar n.
- No associated artery
- Same fascial plane
Radial Nerve

• If just getting hand
  – Start at wrist
  – Identify radial artery
  – Follow proximally
  – Nerve lateral to a.

• If getting wrist
  – Above elbow
  – Find nerve as exit groove
Radial Nerve – Below/At Elbow
Radial Nerve (above elbow)
Musculocutaneous Nerve

- [http://www.usra.ca/sb_pmus](http://www.usra.ca/sb_pmus)
Practicum

• 4 groups

1. Needle practice on Phantom
2. Posterior Tibial
3. Popliteal
4. Forearm