Injections of the Joints & Soft Tissues

Matthew Kanaan DO, MS
Outline / Goals

- Injection basics (risks, contraindications, supplies)
- Upper extremity Injections
- HANDS ON - Simulated needle w/ marking each other
- Lower extremity Injections
- HANDS ON - Simulated needle w/ marking each other
- **High fives at the end !!!**
Keys to Injection

• Anatomy

• Landmarks

• Orientation

• Don’t inject things that pulsate, or ooze
Risks

- Infection (1: 10,000)
- Bleeding
- Reaction to medication /Allergy
- Post-injection flare (<5%)
- Vasovagal
- Skin atrophy
- Skin hypopigmentation
- Injection of an artery, vein, or lymph node (BAD)
Contraindications

- Surrounding cellulitis
- Septic arthritis
- Osteomyelitis
- Coagulopathy
- Joint prosthesis
- Poorly-controlled diabetes mellitus
- Patients with greater than 10 allergies (Relative Contraindication)
Tools for Injection

- Chlorahexadine Swabs (iodine?)
- Pen for marking
- Proper needle size and syringe
- Corticosteroids
- Anesthetic
- Sterile water or Saline (huh?)
- Gauze 4 x 4’s
- Ethyl Chloride / Cold Spray
What are we Injecting?

- Virtually painless local anesthesia: diluted lidocaine proves to be superior to buffered lidocaine for subcutaneous injection. - 2012
  - 1:10 ratio used of anesthetic to saline

- Bupivacaine and levobupivacaine induce apoptosis in rat chondrocyte cell cultures at ultra-low doses
  - Both chondrotoxic compared to control

- The chondrotoxicity of single-dose corticosteroids - 2012
  - Looked at Dex, Kenalog, and Celestone
  - Celestone was significantly more toxic at 14 days then dex, or Kenalog

- The In Vitro Chondrotoxicity of Single-Dose Local Anesthetics – 2013
  - Lidocaine > Bupivacaine > Ropivacaine

- Effects of Local Anesthetics on Articular Cartilage- 2011
  - Lidocaine > Bupivacaine > Ropivacaine
Cocktails

- 1ml Dexamethasone (4mg)
- 1ml Kenalog (40mg)
- 1ml Ropivacaine
- 4ml Sterile Water
- 1 ml Dexamethasone (4mg)
- 1 ml Kenalog (40mg)
- 3ml 1% Lidocaine
- 1 ml Betamethasone (6mg)
- 1ml 1% Lidocaine

**MY CABINET**
- Decadron
- Kenalog
- Celestone *superficial
- Sterile water
- Ropivacaine 0.5%
- Lidocaine 1%
Needles

- 18g always for draw up, and aspiration
- 25g x 1.5 inch for most
- 22g x 1.5 inch if you want to be faster
- 25g x 2 inch, consideration
Miscellaneous Helpful Hints

- Orient yourself before sterilizing the field
- Make skin mark with needle cap, or pen
- Use ethyl chloride “at a distance”, wait for blanch
- Fully inject steroid into joint space prior to withdrawal of needle
- Don’t ever say “Oops”
Shoulder Anatomy

Anterior view
- Subscapularis tendon
- Subscapularis muscle
- Biceps tendon (long head)

Posterior view
- Supraspinatus muscle
- Supraspinatus tendon
- Infraspinatus muscle
- Infraspinatus tendon
- Teres minor muscle
- Teres minor tendon
Subacromial Space

Figure 1. A lateral perspective of the shoulder demonstrating the coracoacromial arch. This includes the acromion, the acromioclavicular joint, the coracoid process, and the coracoacromial ligament, all of which form a roof over the supraspinatus tendon.
Figure 1. The entry point for a subacromial space injection is inferior and medial to the corner of the acromion process (a). The shoulder is grasped with the thumb at the posterior border of the acromion and the forefinger on the coracoid process. (The acromion and coracoid process are outlined in black.) A lateral view (b) shows the needle position relative to the joint structures. The needle is parallel to the undersurface of the acromion, is directed upward toward the coracoid process at an angle of about 15°, and is inserted about 11/8 to 13/8 in. The position of the needle is important because it can enter the glenoid space if it is angled medial to the coracoid process in the true horizontal plane.
Subacromial Injection

- Posterior-lateral corner of acromion
  - Mark 1 cm below, aiming at the AC joint
- Large volume
Glenohumeral Joint Injection

- Posterior approach

- Identify Posterolateral corner of acromion
  - Mark 2-3 cm below, aiming anteromedially, towards the coracoid process

- Large volume
Acromioclavicular (AC) Joint

bump from AC separation
AC Joint Pathology

Acromioclavicular Osteoarthritis
AC Joint Injection

Small Volume
Lateral Epicondylosis

Figure 1: Tenderness in this bony area (the lateral epicondyle) is a sign of tennis elbow.
Lateral Epicondylosis Injection

- Small volume
- Origin of the ECRB
- Point of maximum tenderness
- CAUTION: don’t keep injecting
Olecranon Bursa Aspiration

- Maybe
Carpal Tunnel Syndrome

Median nerve is compressed at the wrist, resulting in numbness or pain.
Carpal Tunnel Injection

- Use the palmaris longus as your landmark
- Inject “ulnar” to palmaris longus
Carpal Tunnel Injection
DeQuervain’s Tenosynovitis

- Common overuse tendonitis involving the abductor pollicus long and extensor pollicus brevis tendons
- Bottom border of the anatomic snuffbox
- Pain with resisted thumb abduction and extension
- + Finkelstein’s maneuver
DeQuervain’s Injection
Trigger Finger
Trigger Finger Injection

- Tenosynovitis of flexor digitorum tendons

- Nodule/thickening catching upon 1st annular pulley
  - Inability to extend finger once flexed

- Attempt treatment early in course of disorder
  - 1 cm distal to distal palmar crease
Lower Extremity

Muscles of the Lower Extremity

- Sartorius
- Rectus femoris
- Vastus lateralis
- Vastus medialis
- Gastrocnemius
- Tibialis anterior
- Soleus
Greater Trochanteric Bursitis
Greater Trochanteric Injection

- Directly over or slightly posterior to greater trochanter
- Point of maximum tenderness
Knee Anatomy
Knee Aspiration

- Therapeutic
- Pain relief
- ROM/swelling reduction
- Combined aspiration/injection
Supine Knee Aspiration / Injection

- Effusion present

- Superior-lateral corner of patella
  - 1 cm inferior
Seated Knee Injection

- Lateral joint line
- No aspiration
Pes Anserine Bursitis

- The pes anserinus is the site of common insertion of the sartorius, gracilis, and semitendinosus tendons

- Medial knee

- Common cause of medial knee pain
Pes Anserine Injection
Ankle Joint Injection

- Indication: DJD, Gout
- Medium injection
1st MTP Joint Injection

- Indicated for diagnosis of gout or for painful DJD, hallux rigidus

- Once again, small joints mean small volume
Thank You