Joint Aspiration/Corticosteroid Injection

Aspiration indications: diagnose cause of swollen joint; tense effusion symptom relief
Steroid injection indications: osteoarthritis, synovitis, inflammatory arthritis, crystalloid arthropathies, tendinopathy (except achilles/patellar), bursitis, entrapment syndromes
Relative contraindications: overlying cellulitis (IV antibiotics required); coagulopathy (INR >1.4, platelets <50, therapeutic anticoagulant <24 hours, clopidogrel <7days); skin lesion over joint; known bacteraemia; adjacent osteomyelitis; joint prosthesis

Joint sizes
Large = knee, ankle, shoulder
Medium = wrist, elbow
Small = MCP, ICP, sternoclavicular, acromioclavicular

Introduction

- **W**ash hands, **I**ntroduce self, **P**atients name & DOB, **E**xplain procedure and get consent
    - Risks: pain, bleeding/haemarthrosis, infection, cartilage damage, damage to local structures
    - Corticosteroid risks: tendon atrophy/rupture, avascular necrosis, skin discoloration, local fat atrophy, soft tissue/pericapsular calcification, osteoporosis
- **Check patients clotting screen, platelet count and if they have been on an therapeutic anticoagulant/clopidogrel**
- Check drug allergies
- Ensure assistant is available
- Examine joint and confirm effusion

Preparation part

- Wash hands and apply apron
- Clean a trolley
- Gather equipment onto bottom of trolley (think through what you need in order)
    - Sterile pack
    - Cleansing snap-sponge (iodine or alcohol/chlorhexidine) x2
    - *OPTIONAL:* Sterile drape with hole in centre (or 2-3 drapes without holes in)
    - 10ml syringe and 2 needles (1 orange *25G*, 1 green *21G*) *for local anaesthetic*
    - Injection/aspiration needle (green *21G* if large joint, blue *23G* needle if medium joint, orange *25G* if small joint)
    - Syringe
        - 20-50ml syringe *if doing aspiration* (depending on size of effusion)
        - 1-5ml syringe *if doing injection* (5ml for large joint, 2.5ml for medium joint, 1ml for small joint)
    - Extra green *21G* needle *to draw up steroid if doing aspiration*
    - Cotton gauze swabs (used whenever needed throughout procedure to dry/clean sterile area)
    - Sterile dressing
    - Equipment to be kept outside of the sterile field
        - Incontinence pad
        - Sterile gloves
        - 10ml 1% lidocaine (maximum 3mg/kg – *note 1ml 1% lidocaine = 10mg*)
        - 2 white-topped sample collection bottles and 1 purple EDTA tube *if doing aspiration*
        - 80mg Depo-Medrone (methylprednisolone acetate) in 2ml vial *if doing large joint injection*
        - 40mg Depo-Medrone (methylprednisolone acetate) in 1ml vial *if doing medium/small joint injection*
- Walk to patient
- Wash hands
- Open sterile pack to form a sterile field on the top of the trolley
- Open packets (without touching the instruments themselves) and drop sterile instruments neatly into the sterile field
- Pick up waste bag from sterile pack without touching anything else and stick to side of trolley

Patient part

Positioning and exposure

- Position patient
- Expose joint and place incontinence pad below
- Examine the surface anatomy of patient's joint
- Locate insertion point
- Mark insertion point with a skin pen/indentation

Preparation

- Wash hands
- Apply sterile gloves using sterile technique (open pack on a side surface)
- Sterilize area
    - Work from middle outwards in one spiral motion (using cleansing snap-sponge)
    - Repeat with second cleansing snap-sponge
    - *Discard used snap-sponges as they are no longer sterile, but note all equipment used after this (including all needles) can be returned to the sterile field after use*

- *OPTIONAL:* Apply the sterile drape over the patient's body so that the hole is in the correct place to allow access to the insertion site (or apply 2-3 drapes centred around exposed insertion site if no holes)
- Anaesthetise tract
  - Ask assistant to snap open lidocaine bottle and hold open upside-down
  - Draw up lidocaine using 1st green needle on 10 ml syringe and expel any air (maximum 7ml if doing injection so the rest can be used with the injection)
  - Change to the orange needle and insert at an acute angle to form a single subcutaneous bleb around insertion site in order to anaesthetise the skin
  - Now use the same needle to anaesthetise the insertion tract up to the joint capsule
    - Always aspirate when advancing the needle (so you know if you enter the joint capsule) and aspirate before injecting lidocaine (to check you are not in a vessel)

Joint aspiration

- With a 20-50ml syringe on the aspiration needle, stretch the skin and insert into the insertion tract
- Aspirate during infiltration
- As soon as fluid enters the syringe, stop advancing the needle and aspirate to fill the syringe/as much as possible
- Withdraw the needle

Joint injection

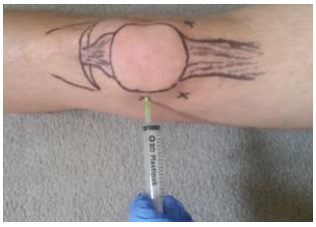
- Ask assistant to snap open Depo-Medrone bottle and hold this and the lidocaine bottle open upside-down
- Draw up the Depo-Medrone and some lidocaine into the same syringe using a green needle and expel any air
  - Large joint: 2ml Depo-Medrone + 3ml lidocaine (in 5ml syringe)
  - Medium joint: 1ml Depo-Medrone + 1ml lidocaine (in 2.5ml syringe)
  - Small joint: 0.25ml Depo-Medrone + 0.25ml lidocaine (in 1ml syringe)
- Change to the injection needle, stretch the skin and insert into the insertion tract
- Aspirate during infiltration
- When in place, aspirate to ensure you are not in a vessel and slowly expel the contents of the syringe
- Withdraw needle

Finally

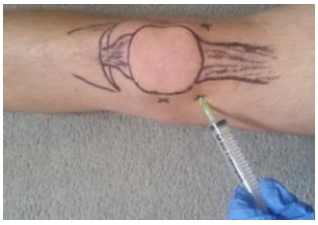
- Dress wound

Joint specific techniques

Knee



- Suprapatellar approach
  - Position patient lying supine with the knee extended
  - Identify the midpoint of the superolateral border of the patella
  - Insert needle 1cm above and 1cm lateral to this point
  - Direct the needle inferomedially and angle slightly posteriorly (at ~ 45˚ from horizontal plane), between the posterior surface of the patella and the intercondylar femoral notch



- Parapatellar approach (preferred aspiration approach)
  - Position patient lying supine with the knee extended
  - Identify the junction of the upper and middle third of the patella on its medial or lateral border
  - Apply pressure to the opposite border of the patella to open the joint space
  - Palpate the groove under the patella (~5-10mm laterally) and insert the needle here
  - Direct the needle medially and a little inferiorly in the horizontal plane, between the posterior surface of the patella and the intercondylar femoral notch
- Infrapatellar approach
  - Position patient sitting on the side of the bed with knees at 90˚ over side
  - Identify the inferior border of the patella and the patella tendon
  - Insert the needle 5mm inferior to the inferior border of the patella, just lateral to the patella tendon
  - Direct the needle superomedially and angle slightly posteriorly (at ~ 45˚ from horizontal), between the posterior surface of the patella and the intercondylar femoral notch

Note: lateral approaches are described above but identical medial approaches may also be used

Shoulder

- Anterior approach (preferred)
  - Position the patient in a seated position with their shoulder externally rotated
  - Palpate the coracoid from anteriorly
  - Insert the needle 1cm lateral to the coracoid (medial to head of humerus)
  - Direct the needle posteriorly and angle slightly superolaterally
- Posterior approach
  - From posteriorly, palpate the acromium (posteriorly) and coracoid (anteriorly)
  - Insert the needle 1cm inferior to the posterior tip of the acromium
  - Direct the needle anteriorly and angle slightly medially towards the coracoid

Wrist

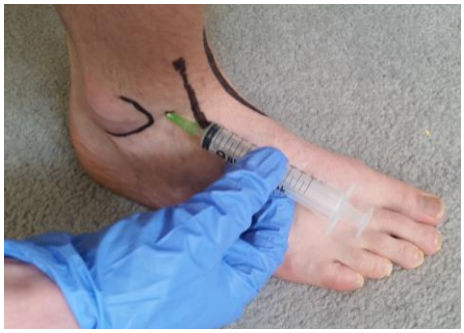
- Position the patients forearm on a stable surface, with their palm facing downwards
- Ask the patient to extend their thumb to identify the extensor pollicis longus tendon, and also locate Lister's tubercle (bony prominence at distal end of radius)
- Insert the needle distal the Lister's tubercle and lateral to extensor pollicis longus tendon
- Direct the needle ventrally, perpendicular to the forearm

Elbow

- Position the patients elbow at 90˚ flexion, rested on a stable surface
- Palpate the olecranon process, the lateral epicondyle and the radial head
- Insert the needle the centre point of this triangle, perpendicular to the skin

Ankle

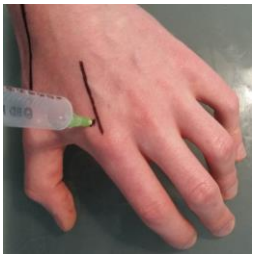
- Anterolateral approach (preferred)
    - Position the patient lying supine with ankle at 90˚
    - Palpate the space between the lateral malleolus (laterally) and the extensor digitorum longus (medially) in the ankle joint line
    - Insert the needle midway between
    - Aim the needle posteriorly, perpendicular to the fibular shaft



- Anteromedial approach (risks damage to dorsalis pedis and deep peroneal nerves)
    - Position the patient lying supine with ankle at 90˚
    - Palpate the space between the medial malleolus (medially) and the tibialis anterior tendon (laterally) in the ankle joint line (just above the talus)
    - Insert the needle midway between
    - Aim the needle posteriorly and slightly laterally, perpendicular to the tibial shaft

Note: you can ask patient to dorsiflex foot against resistance to help identify tendons

Metacarpophalangeal joint



- Rest the hand on a stable surface, palm down with the fingers slightly flexed
- Insert the needle dorsally, either medial or lateral to the extensor tendons

To complete

- Thank patient and cover them
- Bin waste and gloves, dispose of sharps safely in sharps bin, clean trolley and wash hands
- If required, label sample tubes and send to lab:
    - White sample tube – MC&S → microbiology
    - White sample tube – crystals → cytology
    - Purple EDTA tube – cell count → haematology

  Note: septic joint WCC = >50,000 cells/µL (>75% polymorphs)
- Fully document procedure in patients notes