Arthrography
General indications

- Assessment of internal derangement
- Intraarticular bodies
- Aspiration for sepsis or crystals
- Steroid injections
- Diagnostic LA injection
General Arthrography Technique

• Consent
• Clean
• LA usually
• Enter joint
• Aspirate
• Confirm position with contrast
• Contrast flows away from needle
• Use dynamic subtraction if available esp. wrist
• Stop if blob
• Fill joint with appropriate contrast
• Take full series no matter what
Technique
Septic arthritis

• Some Lidocaine is bacteriostatic – avoid in joint

• If dry tap
  – Confirm needle position with air
  – Non ionic contrast probably not bacteriostatic
  – Irrigate with - Non bacteriostatic saline
  – Use bung on syringe, or transport medium
MRI Arthrography Technique

- Gd 1:200-250 dilution
- Tech. usually adds 1ml of Gd to 100ml bag of saline (or 5 to 500)
- You draw up 10mls of this and add 10mls of 300 mg/dl iodine = 1:200 Gd
- Don’t dilly dally after injection
  - Contrast is absorbed from joint
  - Especially in synovitis
  - Check MRI is ready for patient
MRI Arthrography
Indirect Technique

• 10mls of Gd IV

• Wait 15-30 mins to scan

• Best with inflammed joints
Anaesthetic Arthrography Technique

• Inform patient - Pain will recur prior to steroid effect
• Keep a diary - Activity V’s pain
  – Until see referring physician
• Record where contrast/LA goes
• Second dose usually more effective
• Keep it simple
  – Only use Bupivacaine/Marcaine if pain intermittent
• 1-5mls of 1% sufficient
• Give steroid first before joint fills up
  – Top up with LA
  – Patient wants the steroid
Single contrast - Iodine

- Most commonly used in shoulder
- Outlines articular surface
- Combine with CT for knee menisci
- 240 mg/dl
Single contrast - Air

- No iodine
- Usually combined with CT
- Best for IA bodies inc. GSW
- Most commonly used in elbow
Double contrast

• Tiny amount of iodinated contrast to line joint
• Fill up with air
• CO2 rapidly absorbed
• Shoulder with CT for labrum
• Shoulder for rotator cuff tear
Joint volumes

- Shoulder 10-12 mls
- Elbow 5 mls
- Wrist 2-3 mls
- Hip 10 mls
- Knee up to 50 mls
- Ankle 5 mls
- Subtalar 3-5 mls
- TMJ 1 ml
General contraindications

- Few
- Controversial to inject contrast if aspirate pus
Imaging for Access

- Fluoroscopy usually sufficient
- CT may be of benefit for SIJ in elderly with OA to see osteophytes
- Ultrasound probably complicates matters
<table>
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<tr>
<th>Joint</th>
<th>Approach</th>
<th>Technique</th>
<th>Aristospan</th>
<th>Aristocort/Kenalog</th>
<th>Depomedrol</th>
<th>Dexamethasone</th>
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Double this is maximum at one time, can be repeated after 3/12...
Shoulder Arthrography

Indications

- RCT
- Labral pathology
- Synovitis
- Adhesive capsulitis
Tailored Approach to MR Arthrography

Clinical History

- Anterior Symptoms
  - Anterior Approach
- Posterior Symptoms
  - Posterior Approach
Shoulder Arthrography Technique

• Anterior approach
  – External rotation
  – Keep below subcoracoid bursa

• Posterior approach
  – Internal rotation
Elbow Arthrography
Indications

- IA bodies
- Internal derangement
Elbow Arthrography Technique

- Hand on tummy or above head
- Neutral rotation
- Pad under elbow
- 38mm 21-23G
Elbow Arthrography

CT

• Arm above head
• Avoid scanning in plane of radius and ulna
• Scan all injected contrast + or –
• 1-2 mm
• Recon all 3 orthogonal planes
• Less good – arm by side
Wrist arthrography

- Intercarpal ligaments
- Triangular fibrocartilage
- Scaphoid nonunion
- Soft tissue ganglia
- Wrist prosthesis
Wrist compartments

- First carpometacarpal
- Midcarpal, which communicates with common carpometacarpal
- Radiocarpal
- Distal radioulnar

Target sites
Wrist arthrography

- Controversy about which compartments and how many compartments need to be injected

- Most common single injection is radiocarpal
SIJ Arthrography Technique

- Remember anatomy
- Joint close together posterior
- Wide apart anterior
- Patient prone
- Roll onto side of interest to line up joint
- Aim for inferior joint

SIJ septic arthritis with psoas abscess
Hip Arthrography

Indications

• Labral pathology with MRI
• Post THR for loosening/infection
• Fistula confirmation

• Pain
  – Diagnosis
    • Lidocaine
  – Treatment
    • Steroid injection
Positioning

- Patient supine
- 15 degrees internal rotation of the hips
  - Toes taped together
- Knees slightly bent
  - Pillow under the knees
Hip Arthrography
Technique

• Feel artery
• Draw artery on skin
• Nerve lateral to artery
• Mark mid neck
• Mark intertroch
• Aim in line of femoral neck
• THR start just lateral
• Contrast should not be in line of psoas
Knee Arthrography

Indications

- Conventional arthrogram for meniscal injury
- Recurrent meniscal tear post surgery
- OCD stability
Knee Arthrography Technique

- Lateral V’s medial
- 38mm 21G
- Prime needle and connecting tube
- Feel PF groove
- Imagine angle
- Single stab
- Finger on patella
- Alternative
  - Infrapatellar
  - Medial or lateral
  - Aim upwards
Knee Arthrography
Infrapatellar Technique

One bit of advice regarding this approach - it is best to find the soft spot immediately below the inferomedial patella. This is simple if you put your finger on the patella, then slide down to the origin of the patellar tendon, then "slide off" the tendon medially. The key is not to go too inferior, because you will end up traversing a thicker part of Hoffa's fat pad and will need a longer needle.
Conventional Knee Arthrography Radiography

- Divide knee into 4 quadrants
- Medial front to back
- Lateral front to back
- Roll patient and stress to open joint
- Needs good tech
Ankle arthrography
Technique

• Feel dorsalis pedis
• Mark on skin
• Screen AP
  – Mark middle of joint
• Turn lateral
  – 38mm needle
  – 21 gauge
  – Either side of artery
  – Aim for joint
Subtalar Arthrography

Indications

• Usually anaesthetic arthrogram to determine source of pain
Subtalar Arthrography

Technique

• Lateral approach
• Roll foot to work out which is lateral
• Fluoro mark anterior aspect of posterior joint
• Must record communications of joint
• CT may be helpful
TMJ Arthrography
Indications

• Clicking
• Pain
• Instability
• Negative conventional MRI
TMJ Arthrography Technique

• Palpate joint
• Mark
• Pray
  – Screening difficult
• Open the mouth with the needle on the condyle, then advance