# Common Musculoskeletal Ultrasound-guided Procedures

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## Disclosures

- Consultant: Bioclinica
- Contractor: POCUS PRO
- Book Royalties: Elsevier
- Not relevant to this lecture

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## Outline:

- Joint
- Tendon sheath
- Bursa
- Cyst
- Calcific tendinitis
- Miscellaneous

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## Joint Aspiration and Injection

- Aspiration:
  - Infection, crystal disease
- Injection:
  - Anesthetic: Lidocaine, Ropivacaine
  - Steroids
  - Therapeutic or diagnostic

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## Joint Aspiration and Injection

- Know which joint recesses become distended and which are accessible
- For joint access:
  - Aim for joint fluid seen at ultrasound
  - Aim for specific joint recess
  - If no recess, aim for joint space

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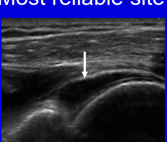
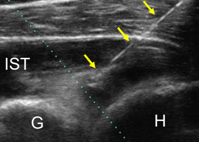
## Glenohumeral Joint

- Posterior joint recess
  - In plane
  - Transducer: axial
  - Lateral to medial
  - Most reliable site*






Eur Radiol 2011; 21:1858

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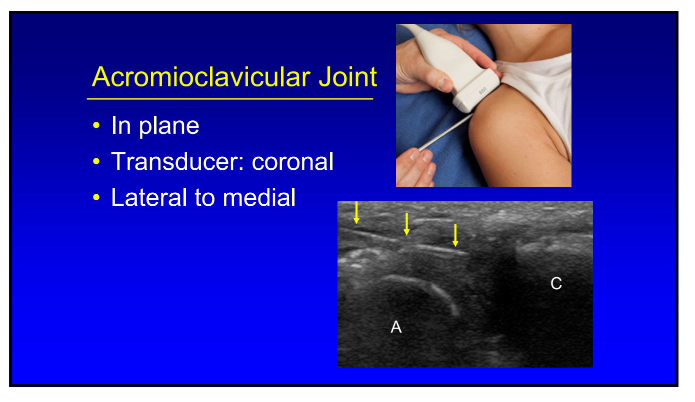


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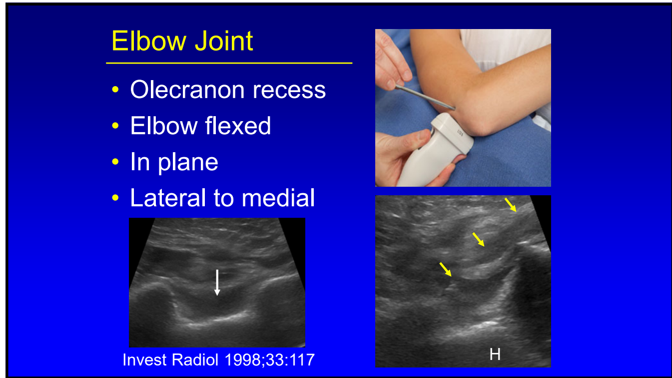


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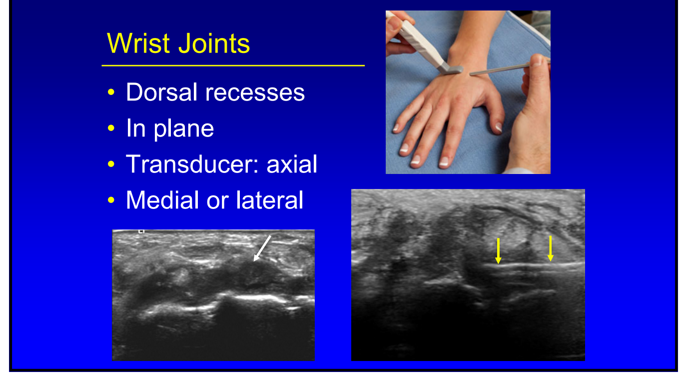


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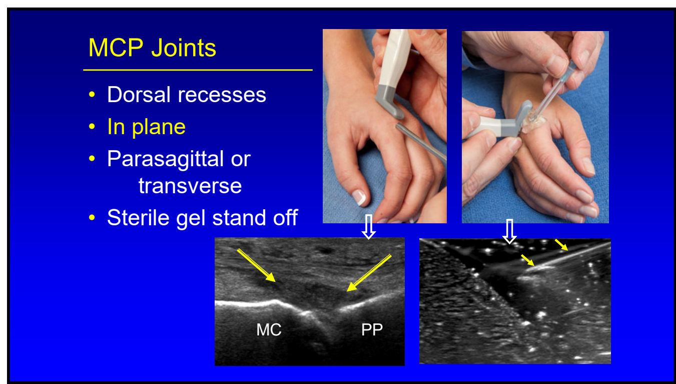


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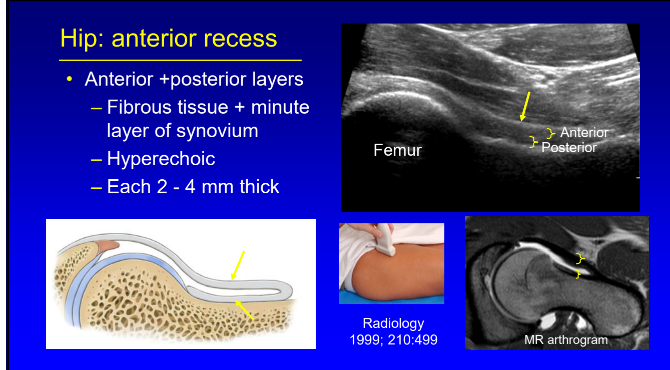


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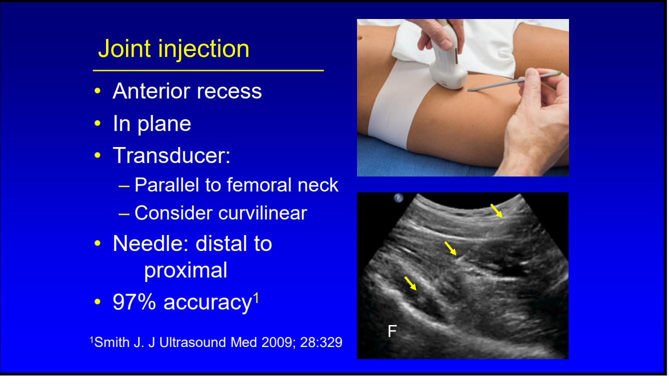


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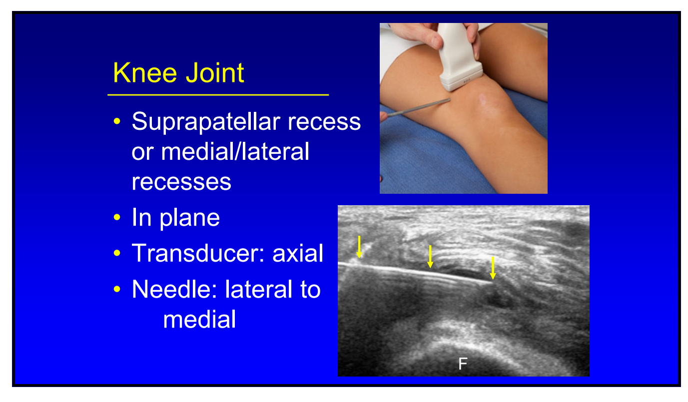


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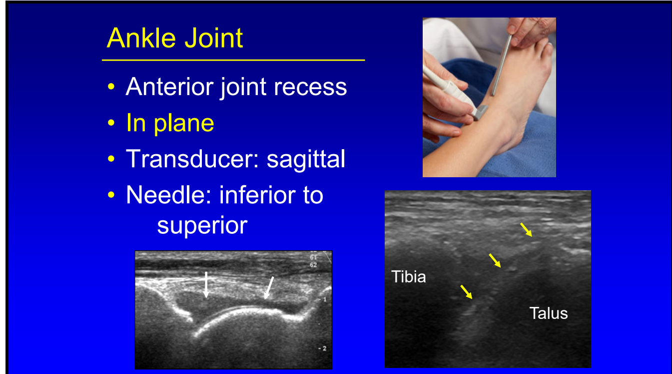


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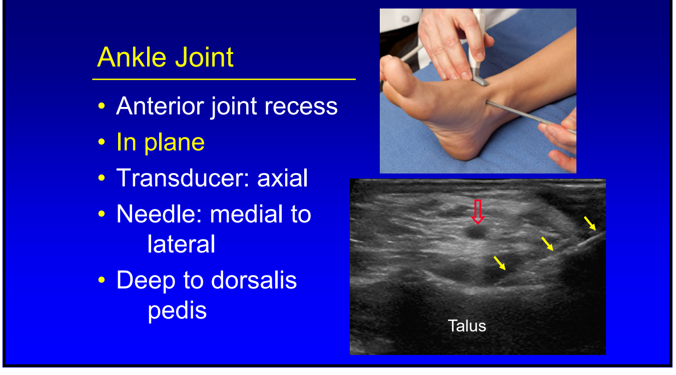


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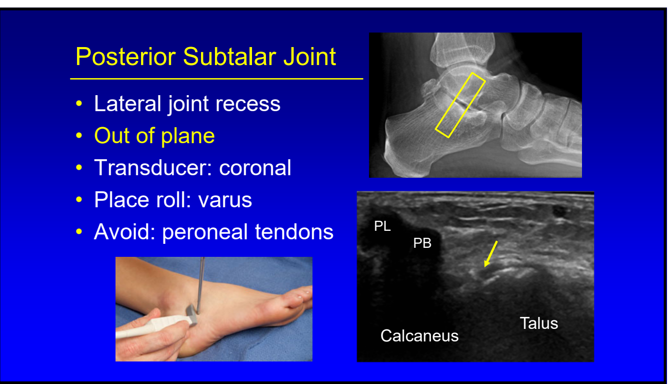


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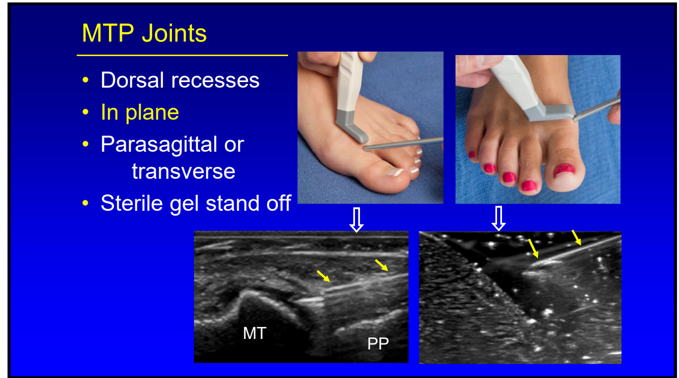


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- Bursa
- Cyst
- Calcific tendinitis
- Miscellaneous

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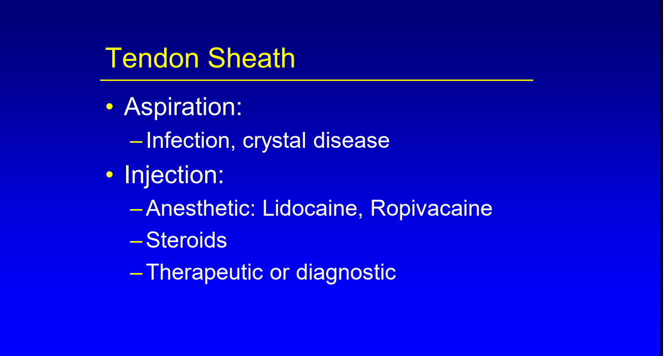


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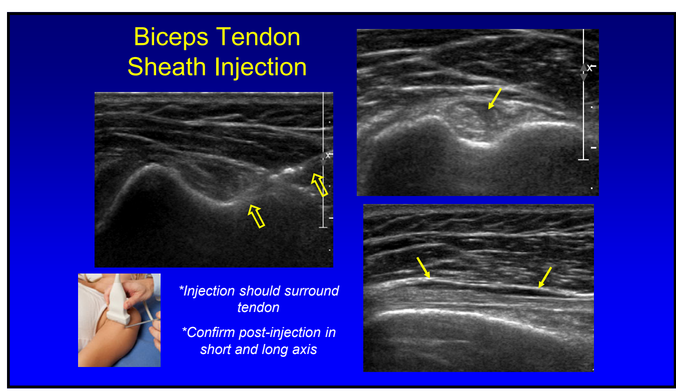


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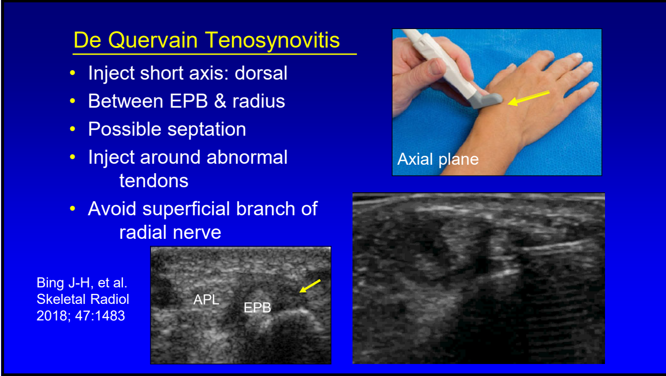


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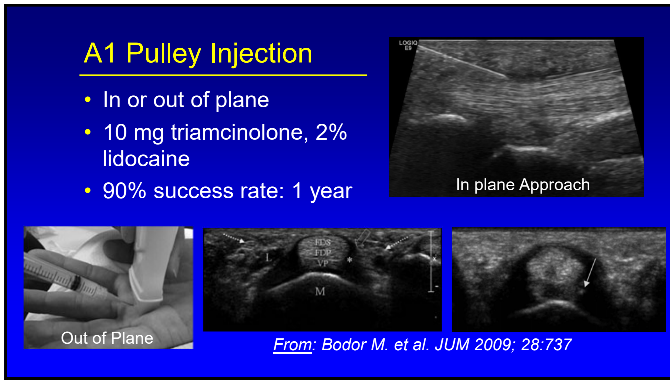


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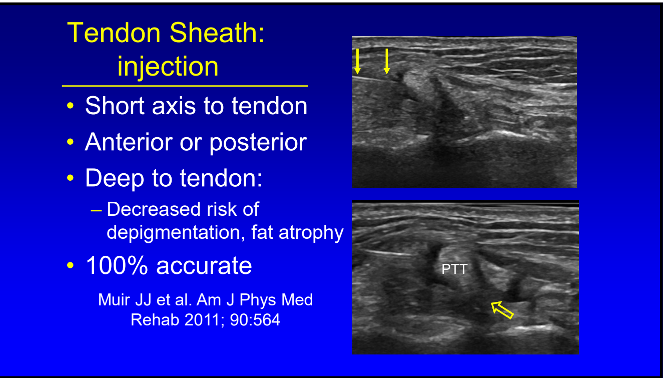


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## Bursa

- Aspiration:
  - Infection, crystal disease
- Injection:
  - Steroids
  - Therapeutic

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## Subacromial-subdeltoid Bursa

- In plane
- Posterior to anterior or lateral to medial
- Patient supine
- Test inject
- Avoid rotator cuff

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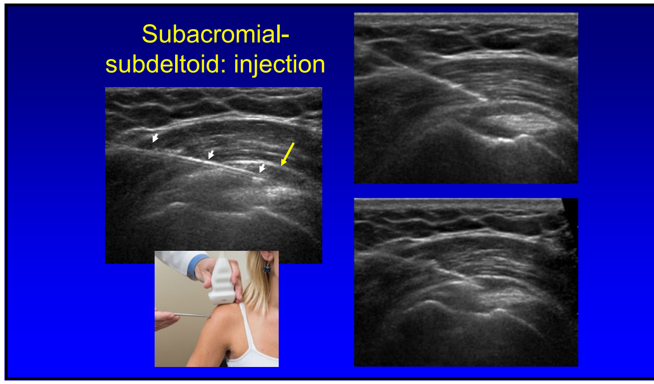


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## Olecranon Bursa

- Arm extended
- Axial plane
- Lateral to medial
- Avoid cubital tunnel

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## Iliopsoas Bursa

- Oblique-axial plane:
  - Superior to femoral head
  - Lateral to medial
  - Inject between tendon, ilium[1]
- Pain relief = successful iliopsoas surgical release[2]

[1]Dauffenbach J et al. J Ultrasound Med 2014; 33:405

[2]Blankenbaker DG. Skeletal Radiol 2006; 35: 565

Ilium

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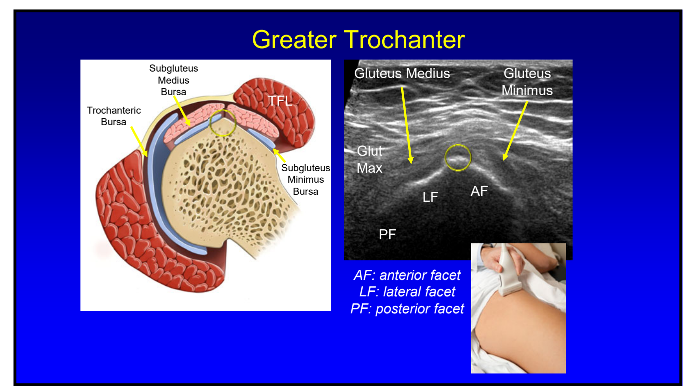


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## Trochanteric Region Bursae

- Trochanteric: deep to gluteus maximus
- Subgluteus medius
- Subgluteus minimus
- Axial or coronal plane

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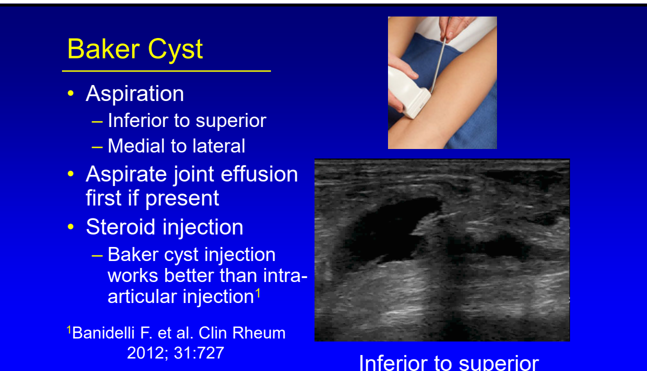


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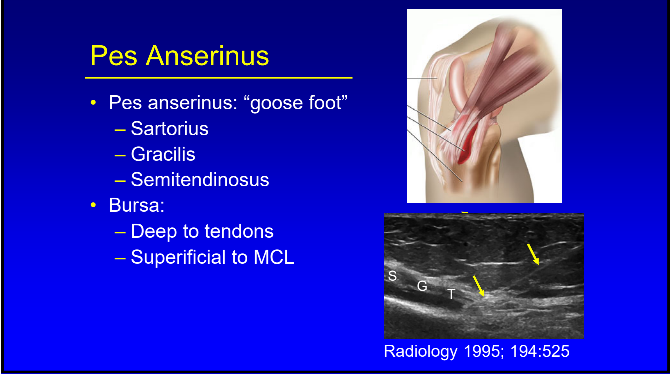


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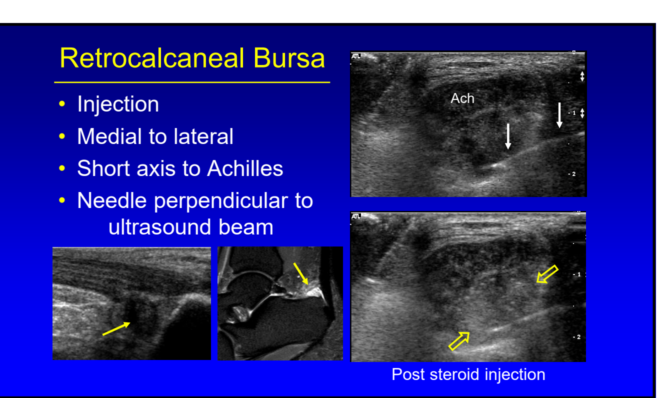


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## Cyst Aspiration

- Ganglion:
  - Large bore needle
  - Wrist, knee: lobular, anechoic or hypoechoic
- Other cysts:
  - Paralabral cysts: shoulder and hip labrum
  - Parameniscal cysts

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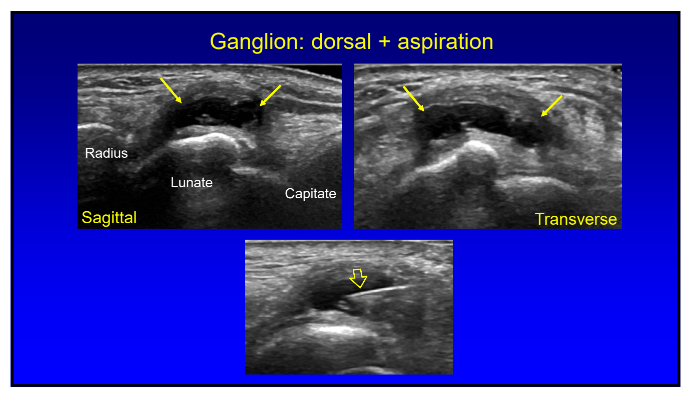


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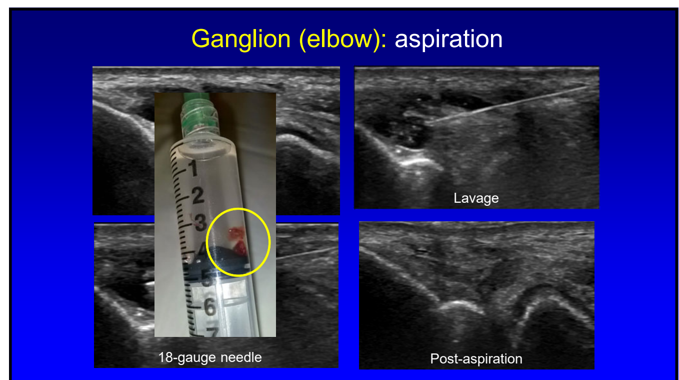


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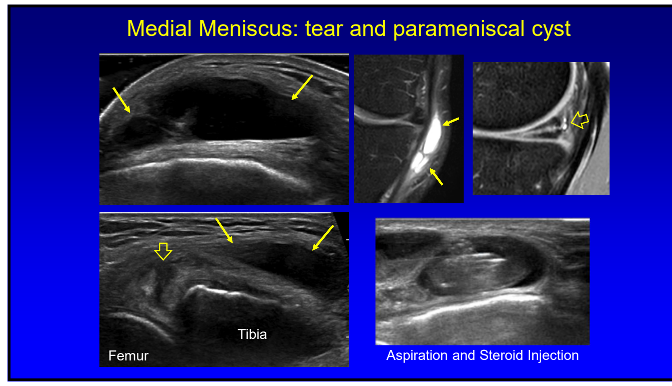


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## Calcific Tendinosis

- Hydroxyapatite deposition: metaplasia
  - Usually do not have cuff tear
- Appearance:
  - 79% hyperechoic & shadowing
  - No shadow: 7%
- Two phases:
  - Formative
  - Resorptive: painful

Farin et al. Skeletal Radiol 1996; 25:551

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## Tendon Calcification:

- Degenerative: thin, linear deposit
- Calcific tendinosis:
  - Formative: well-defined, dense shadow
  - Resorptive:
    - Globular, amorphous
    - Variable shadow
    - Best success with aspiration

Uhthoff. J Am Acad Ortho Surg 1997; 5:183

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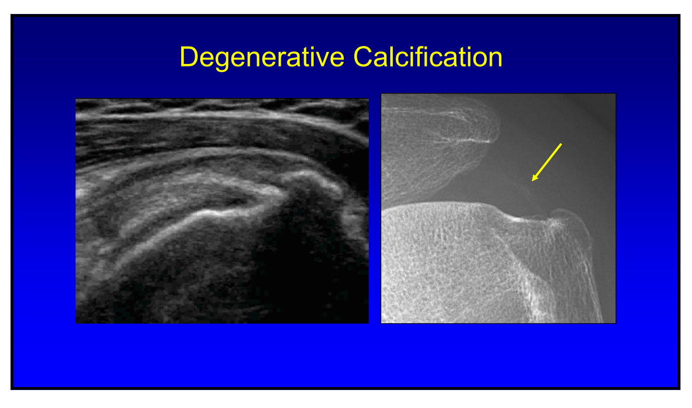


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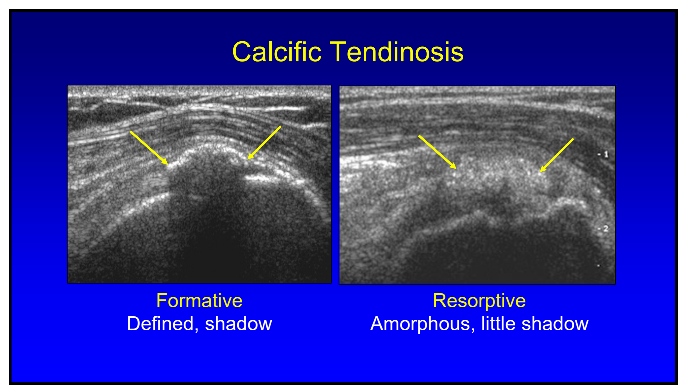


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## Calcific Tendinosis: aspiration

- Percutaneous lavage and aspiration
  - Best: rounded amorphous calcification
  - Correlate with radiography
- 3- 10 cc syringes: Lidocaine
- 20 – 22 gauge needle
- Position patient: syringe is dependent

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## Calcific Tendinosis: aspiration

- Inject Lidocaine, then aspirate
  - Dilute calcification
  - Syringe dependent
  - Calcification will flow into needle
  - Repeat until calcification decreases
- Inject steroids into adjacent bursa

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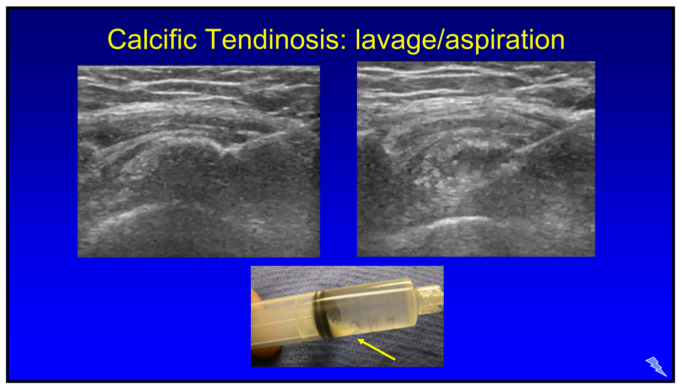


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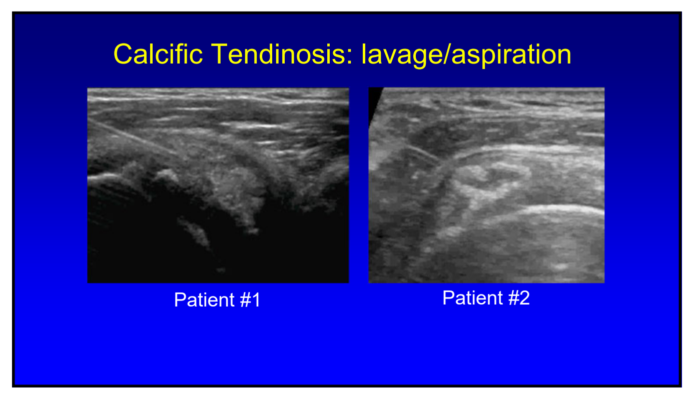


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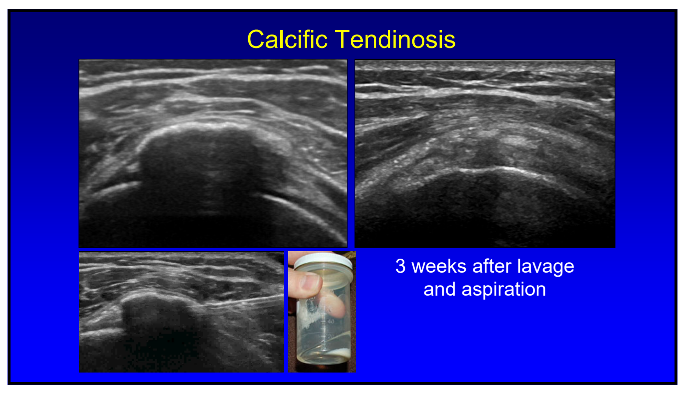
## Calcific Tendinosis



3 weeks after lavage and aspiration

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## Calcific Tendinosis: results

- Calcium decrease correlates with symptom improvement
- Improvement: 91% at 1 year*
  - Calcium gone in 89%
  - Transitory recurrence at 15 weeks: 44%
  - Improved symptoms at 1 year
- No difference at 5, 10 years**

*del Crura, AJR 2007; 189:W128
**Serafini G, Radiology 2009; 252:157

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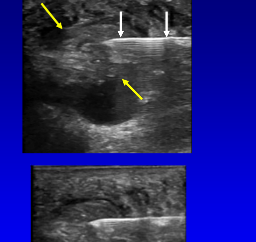
## Morton Neuroma

- Steroid injection[1]
  - 3 month: pain relief
- Alcohol injection[2]
  - Symptoms return at 5 yrs
- Radiofrequency ablation[3]
  - 85% effective at 6 months



[1]Thomson CE JBJS 2014; 96A:334
[2]Gurdezi S Foot Ank Int 2013; 34:1064
[3]Chuter GSJ Skeletal Radiol 2013; 42:107

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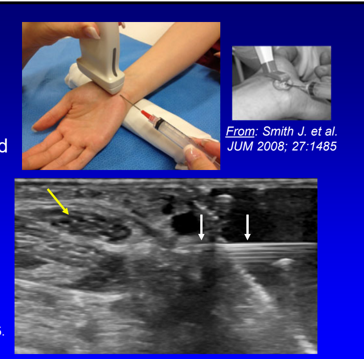
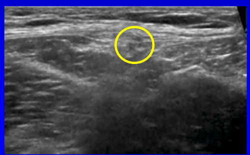
## Carpal Tunnel Injection

- Axial plane: ulnar to radial
- Sterile gel stand-off
- Begin over ulnar nerve and stay superficial
- Inject adjacent to median nerve
- Cross-sectional area may decrease within 1 week after steroid injection[1]



*From: Smith J. et al. JUM 2008; 27:1485*



[1]Cartwright MS et al. Muscle Nerve 2011; 44:25.

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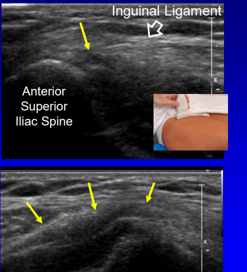
## Meralgia Paresthetica

- Sensory: anterolateral thigh
- Hypoechoic enlargement
- Ultrasound-guided steroid injection

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## Take Home Points:

- Joint:
  - Aim for recess
- Bursa:
  - Know anatomic locations
- Cyst:
  - Large bore needle
- Calcific tendinitis:
  - One puncture, lavage and aspiration

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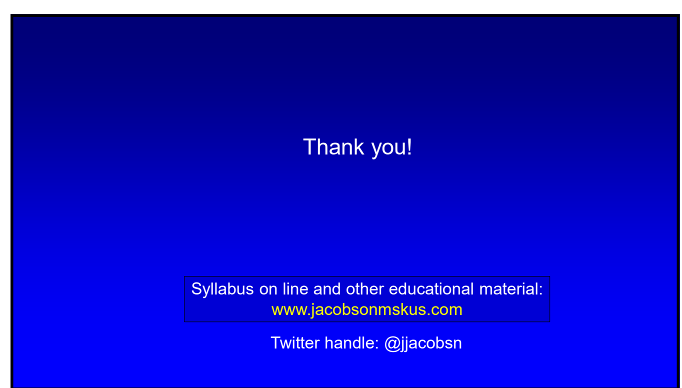


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