Shoulder Interventional Techniques

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Outline:
- Joint
- Tendon sheath
- Bursa
- Cyst
- Calcific tendinosis
- Tendon treatments

Joint, Tendon Sheath, Bursa
- Aspiration:
  - Infection, crystal disease
- Injection:
  - Anesthetic: Lidocaine, Ropivacaine
  - Steroids
  - Therapeutic or diagnostic

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

Acromioclavicular Joint
- In plane
- Transducer: coronal
- Lateral to medial

Note: all images from the textbook Fundamentals of Musculoskeletal Ultrasound are copyrighted by Elsevier Inc.
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Tendon Sheath
- Axial versus longitudinal
- Aspiration: look for fluid collection
- Injection with steroids:
  - Do not inject steroids into tendon
  - Risk of tendon rupture
  - Test needle location with Lidocaine first

Biceps Brachii: sheath injection
- Ultrasound-guided: highest accuracy¹
  - Statistically significant difference in pain relief compared with blind injection at 33 weeks²
- In plane, lateral to medial:
  - Deep to tendon: avoid SA-SD bursa
  - Avoid anterior circumflex humeral artery
- Glenohumeral joint extension: if 5 ml injected

¹Hashiuchi et al. J Sho Elb Surg 2011; 20:1069
²Zhang et al. Ultrasound Med Bio 2011; 37:729

Biceps Tendon
Long Head: Sheath Injection
- In plane with transducer
- Lateral to medial:
  - Avoid branch of anterior circumflex humeral artery

*Injection should surround tendon
*Confirm post-injection in short and long axis

Biceps Tendon Sheath Injection

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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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Cyst Aspiration
- Ganglion cyst:
  - Large bore needle
- Wrist, knee: lobular, anechoic or hypoechoic
- Other cysts:
  - Paralabral cyst

Paralabral cyst
- Usually with labral tear
- Aspiration
  - Axial plane
  - Lateral to medial

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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


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

Farrn et al. Skeletal Radiol 1996; 25:551

Calcific Tendinosis: resorptive phase

Patient #1
Patient #2: Intra-osseous invasion

Calcific Tendinosis: supraspinatus
Use of Tendon Anisotropy

Long axis
Subscapularis: calcific tendinosis

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

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

Calcific Tendinosis: lavage/aspiration

Patient #1
Patient #2

3 weeks after lavage and aspiration
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 Crona, AJR 2007; 189:W128
**Serafini G, Radiology 2009; 252:157

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PRP and Tendon Injection

- Rotator cuff
  - PRP not beneficial
- Supraspinatus
  - Interstitial tear
  - No difference between PRP and saline

1Hurley ET et al. Arthroscopy 2019; 35:1584

Take-home Points

- Joint: aim for recess
- Bursa: know locations
- Ganglion cyst: large bore needle
- Calcific tendinosis:
  - One puncture technique
  - Lavage and aspiration

Syllabus on line and other educational material:
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