Musculoskeletal Ultrasound: Dynamic Imaging

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Objectives:
- To demonstrate musculoskeletal pathologies requiring:
  - Joint movement or positioning
  - Muscle contraction

Biceps Tendon Dislocation

Impingement: supraspinatus
Isolated Ulnar Nerve Dislocation

Snapping Triceps Syndrome: *dynamic imaging*

Ulnar Collateral Ligament: valgus stress
- >1 mm asymmetric gapping = 87% accuracy in diagnosis of UCL tear
  - MR arthrography accuracy = 88%
  - US + MR arthrography: accuracy = 98%
- Asymmetric joint space widening with stress:
  - Normal: 1.3 mm or less
  - Partial tear: 1.2 – 3.0 mm
  - Full thickness tear: 2.8 – 4.8 mm

Roedl JB et al. Radiology 2016

Ulnar Collateral Ligament: partial tear

Ulnar Collateral Ligament: laxity
  With valgus stress
Dislocation: extensor carpi ulnaris

Extensor Pollicis Longus: impingement

Iliopsoas Complex

Snapping Hip Syndrome: iliopsoas

Snapping Gluteus Maximus / Iliotibial Band

Snapping Conjoined Long Head Biceps Femoris, Semitendinosus + Sacrotuberous Ligament
Patellar Clunk Syndrome

Semitendinosus Snapping over Semimembranosus

Peroneal Subluxation: *dynamic imaging*

Dislocation: peroneus brevis & longus

Intrasheath Peroneal Subluxation: Type A

Muscle Hernia: *anterior tibialis*
Achilles Tendon: *dynamic imaging*

**Long Axis**

**Dynamic Evaluation**

- Compression
  - Between transducer and palpation
  - Bursae (dorsal) compress, neuromas (plantar) do not
- Sonographic Mulder Sign
  - Scan plantar: coronal plane
  - Neuroma displaces: plantar
  - Palpable click

Torrani M et al. AJR 2003; 180:1121
Zanetti M et al. Radiology 1997; 203:516

**Dynamic Imaging: Mulder's Maneuver**

**Slipping Rib Syndrome**

**Dynamic Imaging: summary**

- Dynamic pathologic conditions
  - Limited number
  - Involve specific structures
- Consider ultrasound for any snapping or painful dynamic situation

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