Meniscus:

- Normal: hyperechoic
- Degeneration: hypoechoic
- Tear: defined hypoechoic cleft to articular surface

*Invest Radiol 1986; 21:332

Meniscus: Accuracy

- 70 patients with surgical correlation
- Sensitivity / Specificity = 88% / 85%
- PPV / NPV = 85% / 88%
- Most studies:
  - US is markedly limited
  - Especially lateral meniscus

Akatsu Y et al. JBJS 2015; 97:799
Meniscus: tear

Horizontal
Vertical
Complex

Buckle Handle Tear: medial meniscus

Osteoarthrosis: meniscus extrusion

Femur
Tibia
MCL

Meniscus: chondrocalcinosis

Parameniscal Cyst:
- Medial more common\(^1\)
- Anechoic or hypoechoic
- Extends to periphery of meniscus\(^2\)
- Look for meniscal tear

\(^1\)AJR 2001; 177:409
\(^2\)AJR 1996; 171:491
PHMM: meniscal cyst

Lateral Meniscus: tear and parameniscal cyst

Medial Meniscus: tear and parameniscal cyst

Deep Venous Thrombosis
- Hypoechoic thrombus
- Not compressible
- No flow
**Popliteal Vein Thrombosis**

- Compression of popliteal vein

**Popliteal Artery Entrapment Syndrome**

- Compression of popliteal artery
  - Abnormal gastrocnemius muscle origin
  - Aberrant tendon slip
  - Abnormal muscle or tendon between popliteal artery and vein
- Evaluate with calf contraction

  Kim HK et al. Skeletal Radiol 2006; 35:648

**Cystic Adventitial Disease:**

- Cyst formation: popliteal artery
- Cause of popliteal artery stenosis and thrombosis
- Cause: degeneration, ganglion

  Skeletal Radiol 1992; 21:33
Cystic Adventitial Disease

- Early: thickened and hyperechoic subcutaneous fat
- Late: anechoic channels (distended lymphatics)
- May appear similar to simple edema
- Lower leg: look for Baker’s cyst rupture

J Ultrasound Med 2000; 19:743

Cellulitis

- Anechoic or hypoechoic
  - Less likely hyperechoic
- Posterior acoustic enhancement
- Swirling of contents with transducer pressure
- Hyperemia

AJR 1996; 166:149

Soft Tissue Abscess:

- Anechoic or hypoechoic
- Posterior acoustic enhancement
- Swirling of contents with transducer pressure
- Hyperemia

Isoechoic Abscess: dynamic imaging

Thigh: abscess

Sagittal  Sagittal T2w
Osteomyelitis and Abscess

Soft Tissue Foreign Bodies

- Wood and plastic: not radiopaque on radiographs
- All soft tissue foreign bodies are initially hyperechoic

Radiology 1998; 206:45

Soft Tissue Foreign Bodies

- Hypoechoic halo: foreign body response
- Smooth and flat: reverberation
- Irregular and small radius of curvature: shadowing

Radiology 1991; 181:231

Wooden Foreign Body

Nerve Entrapment

- US findings:
  - Nerve enlargement proximal to entrapment
    - Best appreciated transverse to nerve
  - Abnormally hypoechoic
    - Especially the connective tissue layers
  - Variable enlargement or flattening at entrapment site

Epidermal Inclusion Cyst

Note heterogeneity, low echo keratin, and through transmission
**Common Peroneal Nerve:**

- Courses around fibular neck
- Osteofibrous tunnel:
  - Between fibula and peroneus longus
  - Repetitive injury, direct compression
- Injury: fibular fracture

**Denervation:**

- Decreased muscle mass
- Hyperechoic
  - From fat replacement, not fibrosis
- If muscle completely replaced by fat
  - Hypoechoic

J Ultrasound Med 1993; 2:73

**Nerve Transection**

- Neuroma formation:
  - Disorganized and tangled nerve end
  - Normal response to nerve transection
  - After amputation:
    - US important to determine if symptomatic

J Clin Ultrasound 1997; 25:85
Hemangioma:

- Hypoechoic to hyperechoic
- Possible anechoic channels and flow on color Doppler imaging
- Hyperechoic phleboliths
- Presence of soft tissue mass favors hemangioma over vascular malformation*

*Radiology 2000; 214:747
Synovial Hemangioma

Soft Tissue Sarcoma:
- Hypoechoic to mixed echogenicity
- US performs equal to MRI in detection of sarcoma recurrence
- US can detect non-palpable superficial recurrence
  1AJR 1991; 157:353
  2AJR 1997; 169:1449

Lymphoma

Malignant Fibrous Histiocytoma

Osteochondroma:
- Hypoechoic cartilage cap covering hyperechoic ossified stalk
- Cartilage cap >1 cm after growth plate closure suggests chondrosarcoma
- Differentiate from adjacent bursa
  SKSkeletal Radiol 1992; 21:33
Take Home Points:

- Meniscus:
  - Limited accuracy
  - Parameniscal cyst: heterogeneous
- Beware of sarcomas
  - May simulate hematoma
  - Hematoma in muscle: tumor until proven otherwise

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