Pathology:
- Tendon
- Ligament
- Cartilage
- Fluid collections and cysts
- Peripheral nerves
- Miscellaneous

Tendon Abnormalities
- Tendinosis:
  - Swollen, hypoechoic, no inflammation
- Tear:
  - Partial-thickness tear
  - Full-thickness tear: retraction

Quadiceps Tendon: tendinosis

Quadiceps Tendon
- Full-thickness tear
  - Complete tendon disruption
  - Tendon retraction: dynamic imaging
  - Joint fluid extending through tear

La et al. AJR 2001; 22:1323
Quadriceps Tendon: full-thickness tear

Long Axis
Sagittal PDw

Quadriceps Femoris Tear: dynamic imaging

Long Axis

Patellar Tendinosis:
- Jumper’s knee
- Hypoechoic swelling
- Mucoid degeneration, possible interstitial tearing
- Hyperemia: neovascularity
- No inflammatory cells

Radiology 1996; 200:821

Patellar Tendon Tear
- Full-thickness tear
  - Hypoechoic
  - Posterior shadowing at ends of torn tendon
  - Tendon retraction
  - Patellar alta

AJR 2001; 176:1535
Patellar Tendon: full thickness tear

Prox Distal

Longitudinal

Pathology:
- Tendon
- Ligament
- Cartilage
- Fluid collections and cysts
- Peripheral nerves
- Miscellaneous

MCL: sprain

MCL: full-thickness tear

MCL
Femur

Longitudinal
Coronal T2w

Femur
Tibia

Short Axis

Lateral Collateral Ligament Injury

Pathology:
- Tendon
- Ligament
- Cartilage
- Fluid collections and cysts
- Peripheral nerves
- Miscellaneous
Meniscus:
• Normal: hyperechoic
• Degeneration: hypoechoic
• Tear: defined hypoechoic cleft to articular surface

*Invest Radiol 1986; 21:332

Meniscus: Accuracy
• 35 patients
• Sensitivity / Specificity = 86% / 69%
• PPV / NPV = 83% / 75%
• Most studies:
  – US is markedly limited

*JBJS-Br 2008; 90-B:1045.

PHMM: degeneration
Sagittal Sagittal PDw

Meniscus: tear

Meniscus: chondrocalcinosis

Pathology:
• Tendon
• Ligament
• Cartilage
• Fluid collections and cysts
• Peripheral nerves
• Miscellaneous
Joint Effusion

- Suprapatellar recess
  - Superior
    - Prefemoral & quadriceps fat pad separation
    - Distends with partial knee flexion
  - Medial and lateral to patella
    - Distends with knee extension
    - Transducer pressure displaces joint effusion

Joint Effusion: sagittal plane

Joint Effusion: transverse plane

Knee Bursae

Anterior Knee Bursa:
- Prepatellar bursa
- Superficial infrapatellar bursa
- Deep infrapatellar bursa

Prepatellar Bursa: aseptic fluid

Superficial Infrapatellar Bursa

Deep Infrapatellar Bursa

Baker Cyst:
- Semimembranosus-medial gastrocnemius bursa
- 50% over age of 50 have communication with knee joint
- Cyst communication to posterior knee between SM-MG tendons required

AJR 2001; 176:373

Baker Cyst
Baker Cyst: rupture + hemorrhage

Baker Cyst: intra-articular body

Baker Cyst: rupture

Pes Anserinus
- Pes anserinus: "goose foot"
  - Sartorius
  - Gracilis
  - Semitendinosus
- Bursa:
  - Deep to conjoined tendon
  - Adjacent to proximal tibia

Radiology 1995; 194:525
Pes Anerinus: bursal fluid

Adventitious Bursae:
- Site of friction
- Myxomatous degeneration of fibrous tissue
- Medial epicondyle:
  - Rider’s bursa: horseback riding
  - Limbo-dancing
    - Trinidadian art form of limbo dancing

Pathology:
- Tendon
- Ligament
- Cartilage
- Fluid collections and cysts
- Peripheral nerves
- Miscellaneous

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

Common Fibular Nerve: entrapment
Common Fibular Nerve: entrapment

Peroneal Intraneural Ganglion

- Joint fluid from proximal tibiofibular joint
  - Enters peroneal nerve via articular nerve branches
  - Shown at MR arthrography after exercise
  - Extends proximal via epineurial sheath
- May also form via tibial nerve

Peroneal Intraneural Ganglia

From: Spinner et al. Skeletal Radiol 2008;37:1091

Intraneural Ganglion

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
Stump Neuroma

Longitudinal Transverse

Transection Neuroma: sciatic

Pathology:
• Tendon
• Ligament
• Cartilage
• Fluid collections and cysts
• Peripheral nerves
• Miscellaneous

Deep Venous Thrombosis
• Hypoechoic thrombus
• Not compressible
• No flow

Take Home Points:
• Common indications:
  – Fluid, cysts, extensor tendon
• Very limited:
  – Meniscus, cartilage, cruciate ligaments
• Suprapatellar recess:
  – Look all around patella
• Baker cyst: often communicates with joint

See www.jacobsonmskus.com for syllabus