Musculoskeletal Ultrasound of the Knee

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Learning Objectives

- Understand Knee US Exam Considerations
- Recognize the normal and abnormal appearance Knee structures
Anterior Knee

Superior

Multilayer appearance
1. Superficial – Rectus
2. Intermediate - Vas L&M
3. Deep – Vastus Intermed
Suprapatellar synovial recess
Suprapatellar fat pad
F – femur
P – Patella

Anterior Knee
Anterior Knee Medial and Lateral
Anterior Knee Patellar Tendon

Hfp – Hoffas fat pad
Medial Knee Anatomy

The lateral collateral ligament (LCL) runs on the outside of your knee. It limits sideways motion.

The anterior cruciate ligament (ACL) connects the femur to the tibia in the center of your knee. It limits rotation and the forward motion of the tibia.

The meniscus is cartilage that absorbs shock in your joint.

The posterior cruciate ligament (PCL) also connects the femur and tibia. It limits backward motion of the tibia.

Articular cartilage lines the bones, cushioning your joint.

Femur (thighbone)

Patella (kneecap)

Tibia (shinbone)

Bursa lies below pes anserine

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20-30 deg of flexion
Meniscofemoral Ligament
Medial Collateral Ligament
Can add valgus stress
Pes Anserine
Sartorius, Gracilic, Semitendinosus
Lateral Knee Anatomy

- Femur
- Quadriceps femoris
- Patella
- Fibular collateral ligament
- Tendon of Popliteus
- Lateral meniscus
- Fibula
- Tibia
- Ligamentum patellae
Lateral Knee

- 20-30 deg flexion
- ITBand in long axis
- Between ant and middle third of lateral knee
- Gerdy’s tubercle
Lateral Knee

- Lateral Collateral Ligament
- Popliteal tendon
- Biceps femoris tendon
Posterior Knee Anatomy
Posterior Knee Medial Tendons

* Articular cartilage

- MHG – Medial Head of the gastroc
- Sa – Sartorius
- St – Semitendinosus
- G – Gracilis
- Mfc – Medial Fem Condyle
Posterior Knee

- Lateral Head Gastroc
- Med Head Gastroc
- Popliteal Vein and Artery
Knee US - Clinical Indications

- Cysts - Baker’s
- Tendon tear/tendinosis - Quad and Patellar
- Ligaments - ITB Friction syndrome
- Bursitis - Prepatellar, Pes Anserine
- Bone - Dx of Osgood Schlatter’s disease
- Joint effusion vs synovitis
- Guided needle aspirations/biopsy
- When MRI is contraindicated
Knee – MRI instead of US

- Dx of internal derangement
- Meniscal, Ligament tears
- Osteochondral abnormality
- Bone Marrow edema
- Full assessment of mass lesions
- Synovial pathology
Med Men Tear – Use Dynamic US
Quad Tendon Tear with effusion

- 45yo female
- Knee swelling
- Weakness climbing stairs
- Acquired in a postop strengthening program
Lateral Knee effusion
Patellar Tendinosis

US

MRI
Medial Gastrocnemius Avulsion
Baker’s Cyst
Chronic Posterolateral Knee Pain

- 35yo female
- Chronic post lat knee pain
- Worse going down hill
- S/P Scope and then TKR
Chronic Popliteus Tendinitis

Popliteus tendon calc