Knee: Joint Abnormalities

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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

Suprapatellar Recess and Gutters

Joint Effusion: transverse plane

- Patella
- Femur

Transverse

Femur

Joint Effusion: transverse plane

- Patella
- Femur

Transverse

Femur

Effusion

- Joint recess
- Between anterior horn of lateral meniscus and tibia

Femur

Hemarthrosis

- Quadriceps
- Patella

Femur

Intra-articular Body

- Joint recess
- Echogenic
- Possible shadowing
- Adherent versus loose body

Femur

Knee Joint

- Suprapatellar recess or medial/lateral recesses
- In plane
- Transducer: axial
- Needle: lateral to medial
Superior Plica

Lipoma Arborescens
- Sonographic findings:
  - Hyperechoic
  - Frond-like mass
  - Pliable
  - Joint effusion


Lipohemarthrosis
- Intracapsular fracture / soft tissue injury
  - Fat from marrow or soft tissues
- Sonography:
  - Fat: hyperechoic
  - Serum: anechoic
  - Blood: hypoechoic

J Ultrasound Med 1995; 14:279
Courtesy of Rob Kimbrough

Synovitis
- Diffuse:
  - Inflammatory: infection, rheumatoid
  - Proliferative: pigmented villonodular synovitis
- Focal:
  - Focal nodular synovitis
  - Dynamic imaging: snapping
Synovial Hypertrophy: total knee arthroplasty and wear debris

Synovial Hypertrophy

Rheumatoid Arthritis
Seronegative Arthritis

Nodular Synovitis: Snapping

Focal Synovitis: Snapping

Pigmented Villonodular Synovitis: knee

Pigmented Villonodular Synovitis

Sagittal
Sagittal PDw
Pigmented Villonodular Synovitis

Patellar Clunk Syndrome
- After total knee arthroplasty
- Up to 7.5% incidence
- Fibrous nodule: intercondylar notch
- Pain with flexion - extension


Gout
- Double contour sign: ultrasound
  - Hyperechoic foci: surface of hyaline cartilage
  - Does not demonstrate anisotropy
  - Unlike normal cartilage interface
  - Disappears with serum urate < 6 ml/dl

Thiele RG, Rheumatol Int 2010; 30:495

Gout: Double Contour Sign

Take Home Points:
- Knee joint recesses
  - Suprapatellar, medial, and lateral
  - Knee position influences distribution
- Synovial hypertrophy:
  - Inflammatory: infection, rheumatoid arthritis
  - Proliferative: PVNS
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