

Ultrasound of Common Knee Pathology

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1

Disclosures

- Consultant: Bioclinica
- Advisor: Philips
- Book Royalties: Elsevier
- Not relevant to this lecture

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Fundamentals of Musculoskeletal Ultrasound are
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2

Outline

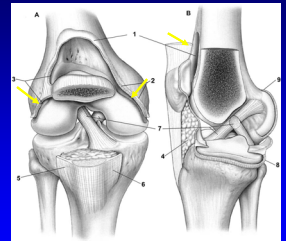
- Joint effusion
- Extensor mechanism
- Baker cyst and other bursa
- Meniscus

3

Joint Effusion

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

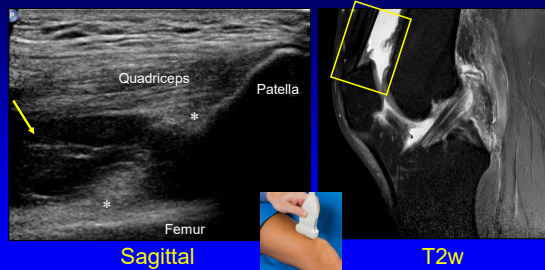
Suprapatellar Recess and Gutters



*From: Miller PJ et al. Am J Sports Med
2001;29:822.*

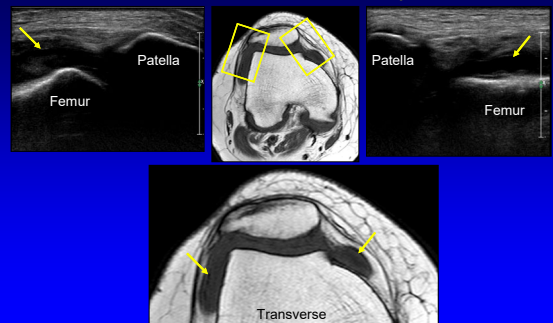
4

Joint Effusion: sagittal plane

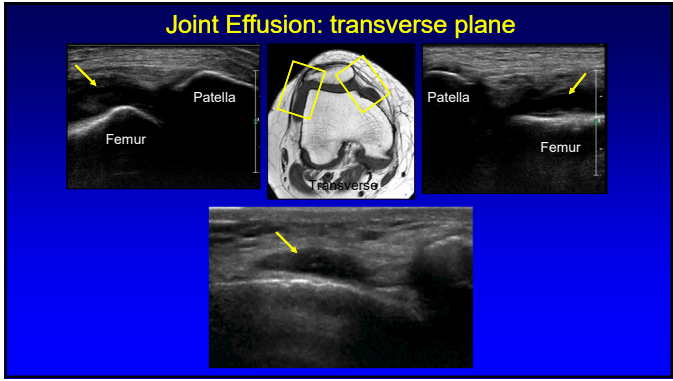


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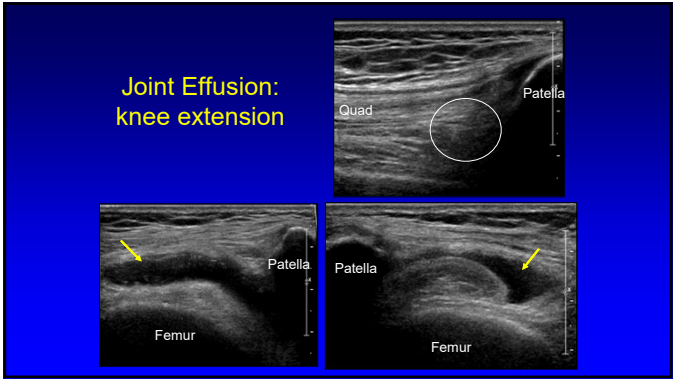
Joint Effusion: transverse plane



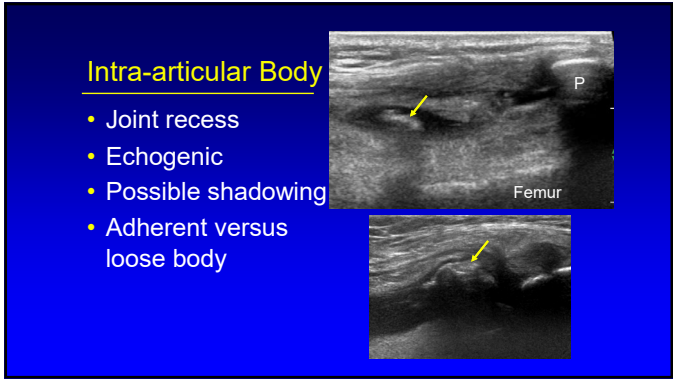
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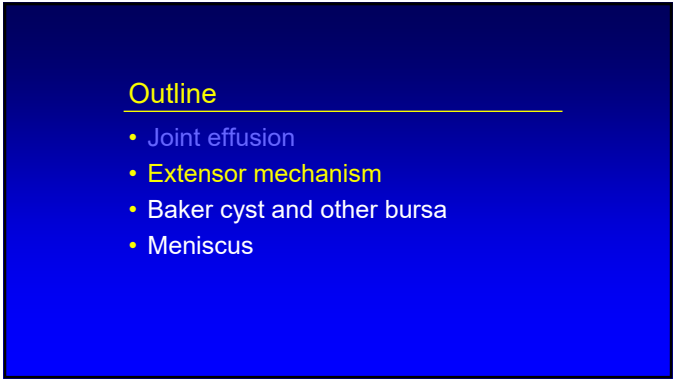
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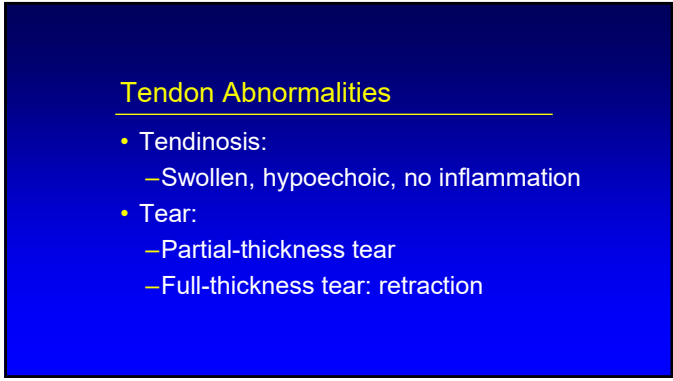
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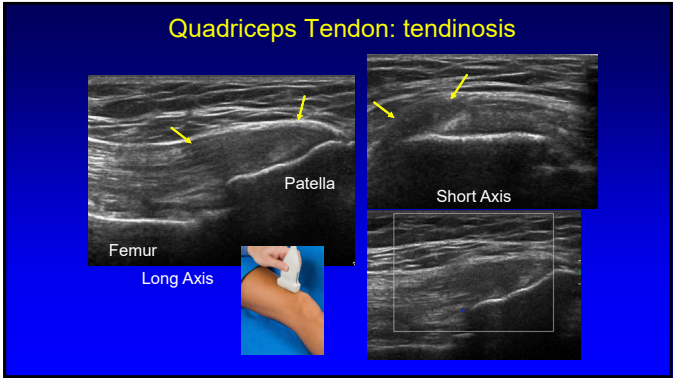
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10



11



12

Quadriceps Tendon: tear

- Partial tear:
 - One to two of three tendon layers torn
- Full-thickness tear
 - Complete tendon disruption
 - Tendon retraction: *dynamic imaging*
 - Joint fluid extending through tear
- 100% accuracy for diagnosis of high-grade and full-thickness tears requiring surgery

Foley R et al. J Ultrasound Med 2015; 34:805

13

Quadriceps Tendon: Partial Tears

14

Quadriceps Tendon: full-thickness tear

15

Quadriceps Femoris Tear: dynamic imaging

16

Patellar Tendinosis

- Jumper's knee
- Mucoïd degeneration
- No inflammatory cells
- Possible partial thickness tear
- Proximal
- Hypoechoic, swollen
- Hyperemia: neovascularity

Radiology 1996; 200:821

17

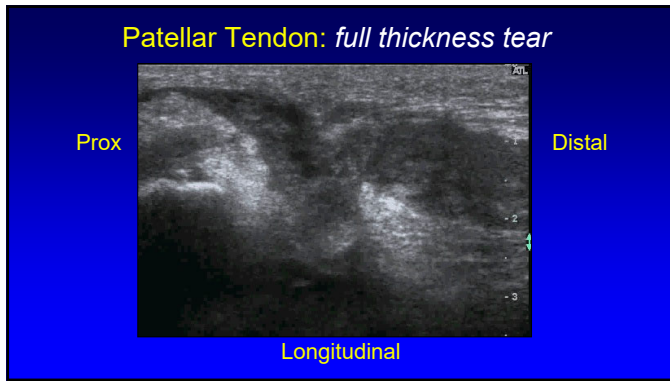
Patellar Tendon Tear

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

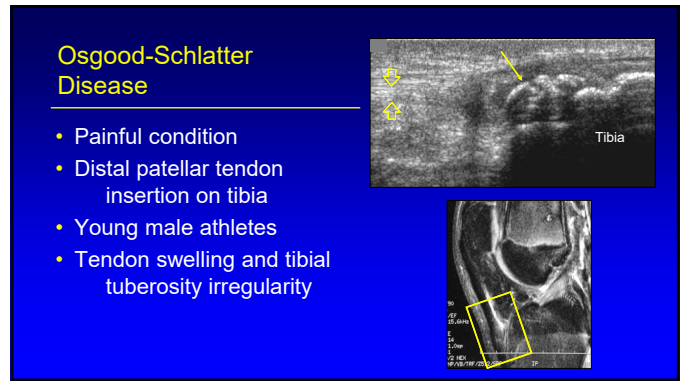
AJR 2001; 176:1535

**Different Patients*

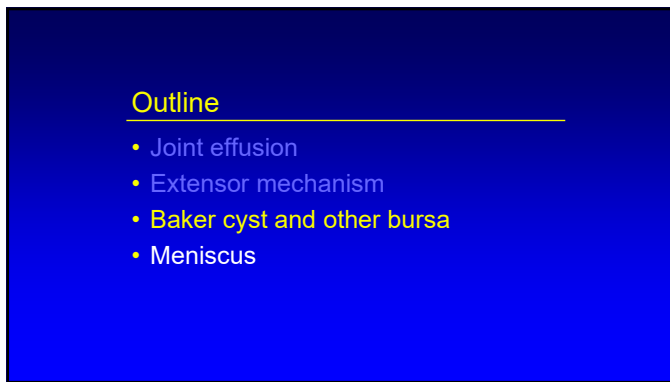
18



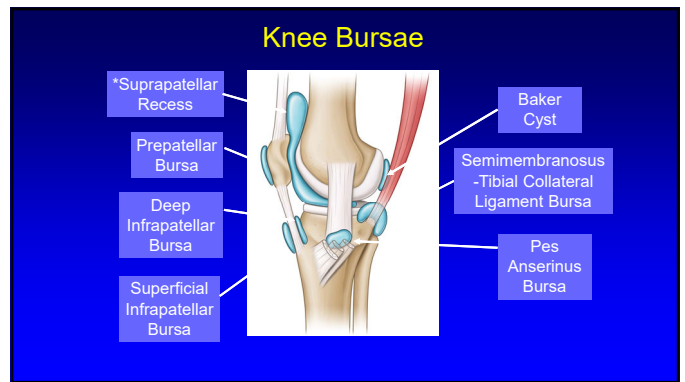
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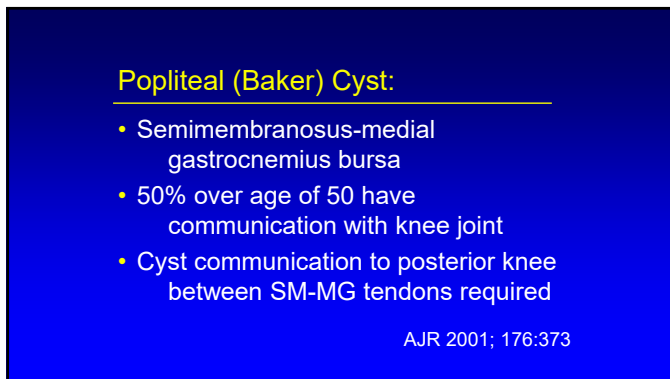
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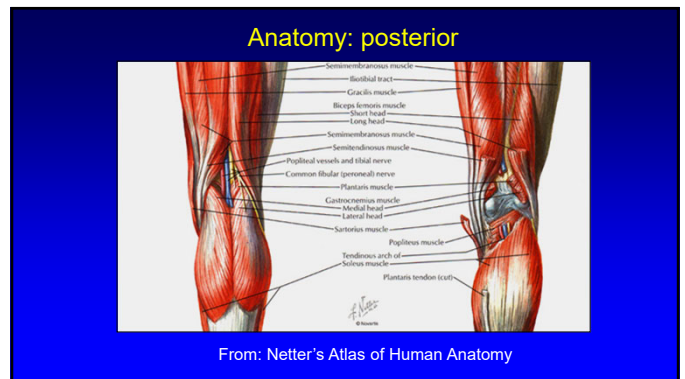
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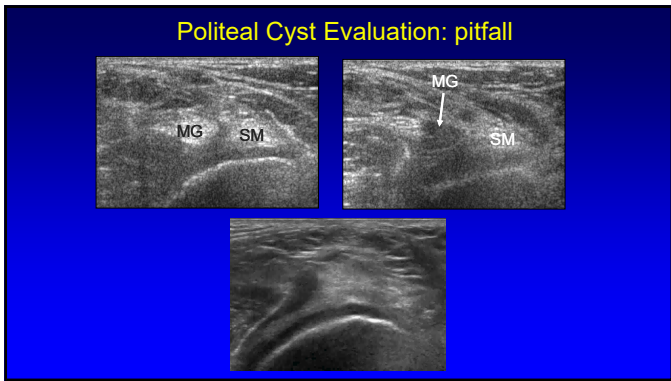
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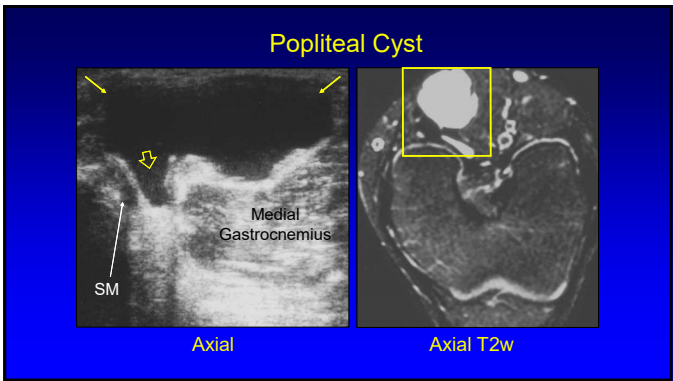
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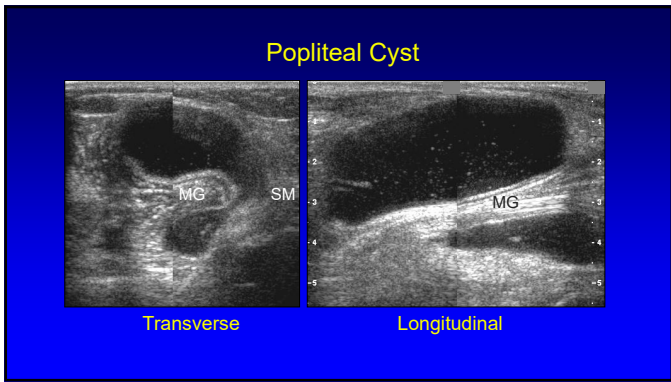
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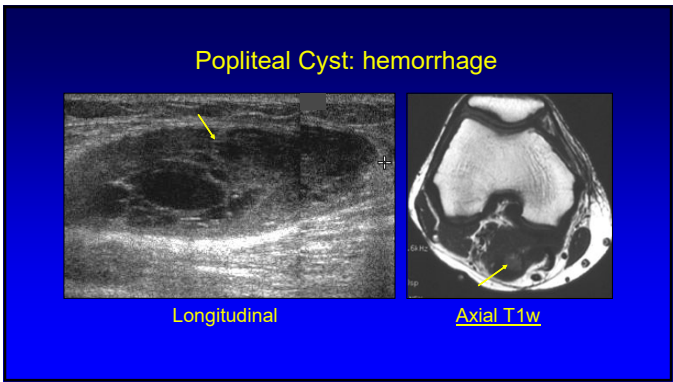
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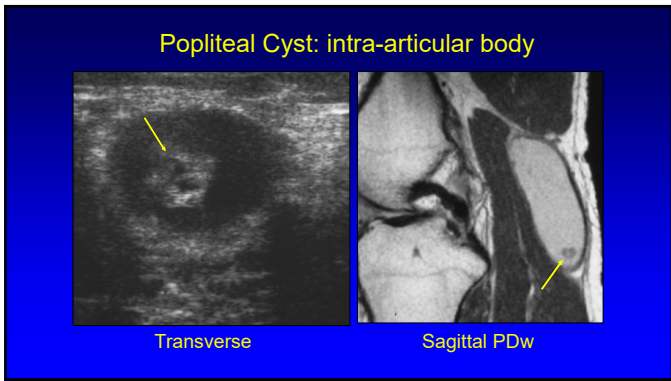
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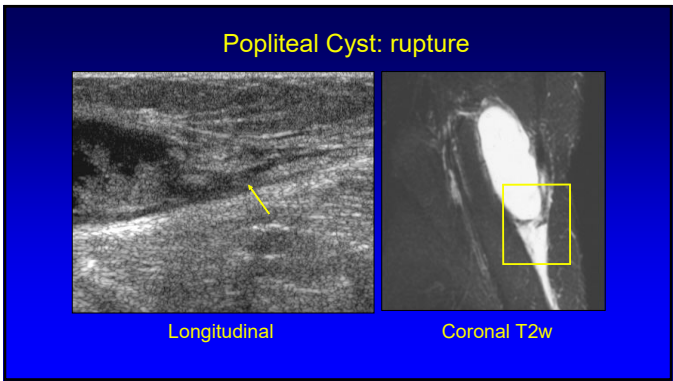
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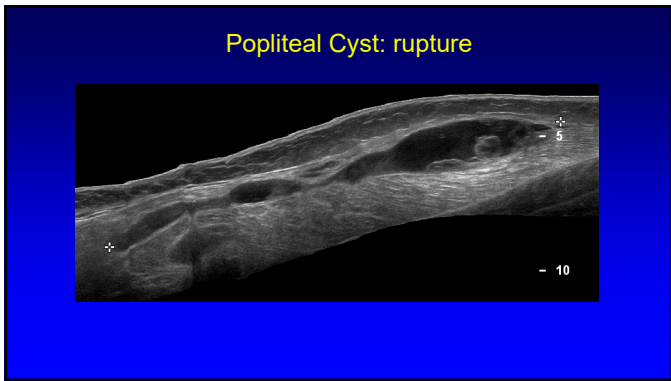
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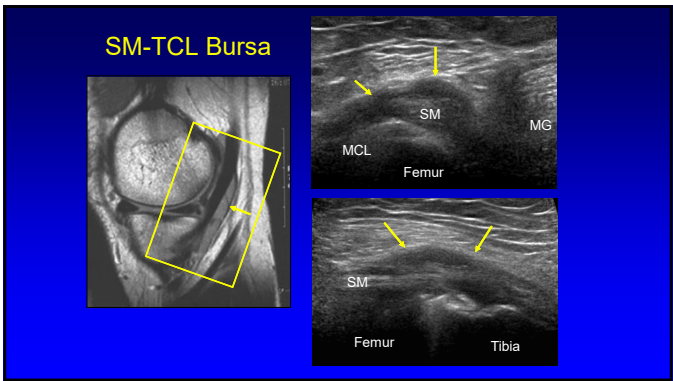
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30



31



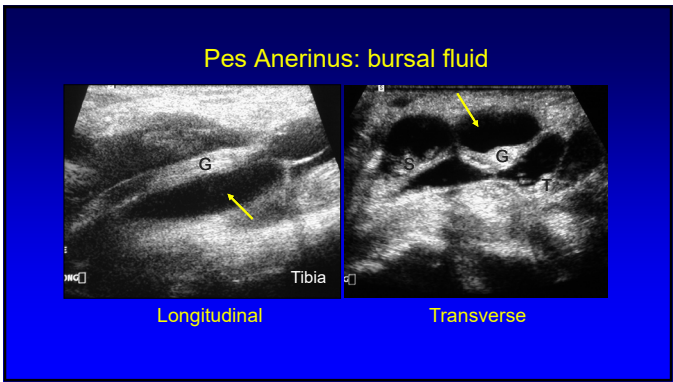
32

Pes Anserinus

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

Radiology 1995; 194:525

33



34

Anterior Knee Bursa

- Prepatellar bursa
- Superficial infrapatellar bursa
- Deep infrapatellar bursa

Patella PT Tibia Normal

35

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

Medial Epicondyle

36

Outline

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- Extensor mechanism
- Baker cyst and other bursa
- **Meniscus**

37

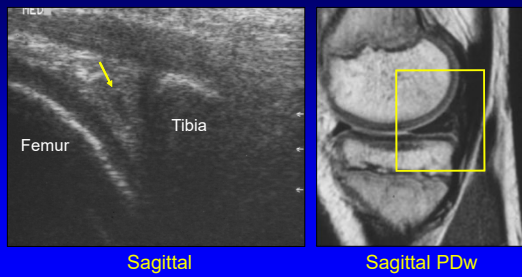
Meniscus:

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

*Invest Radiol 1986; 21:332

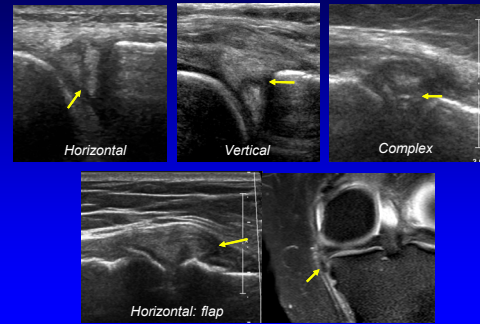
38

PHMM: degeneration



39

Meniscus: tear



40

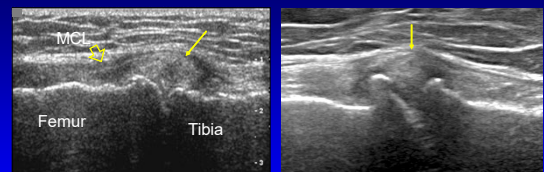
Meniscus: Accuracy

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

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

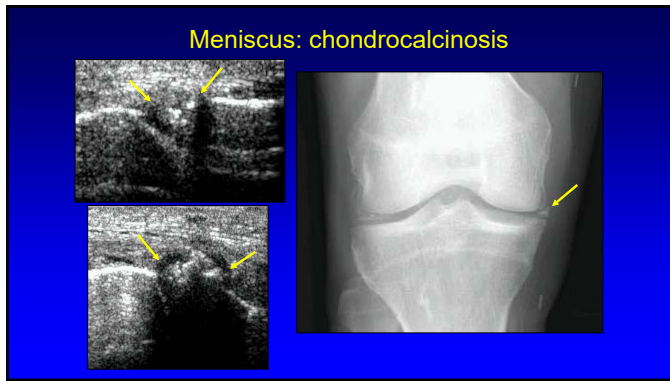
41

Osteoarthritis: meniscus extrusion

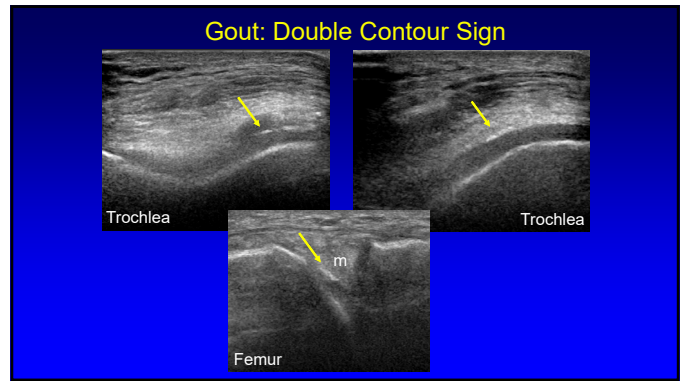


Medial Meniscus

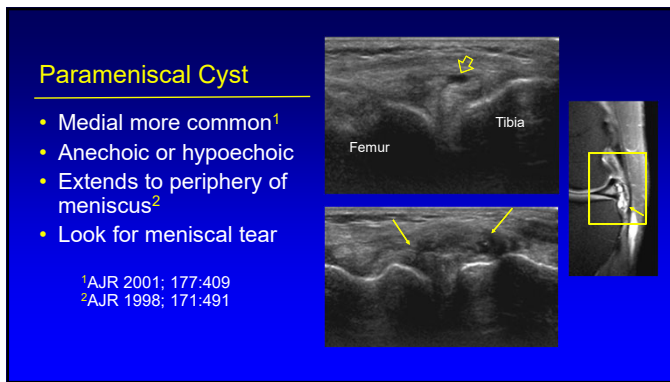
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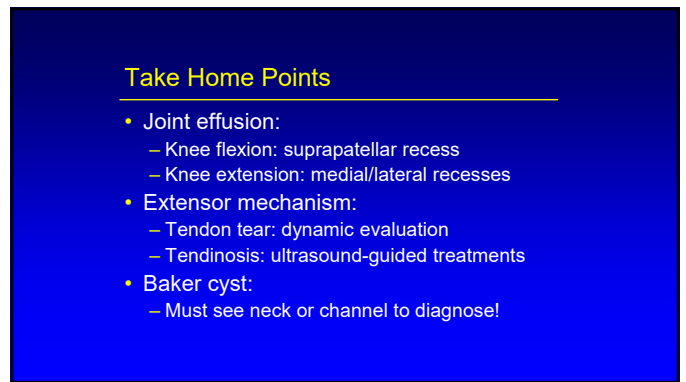
43



44



45



46



47