

Knee Injury Pathology



Team healers.

Pathology

Intra Articular Pathology

Pathology that occurs within the joint capsule

Extra Articular Pathology

Pathology that occurs outside the joint capsule

Pathology

Extra Articular Soft Tissue Pathology

Bursitis- the fluid sacks called bursae in body are designed for friction control. Bursitis is usually associated with other injuries or overuse problems.

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Prepatellar bursitis- sx: swelling on top of the knee cap due to direct trauma.

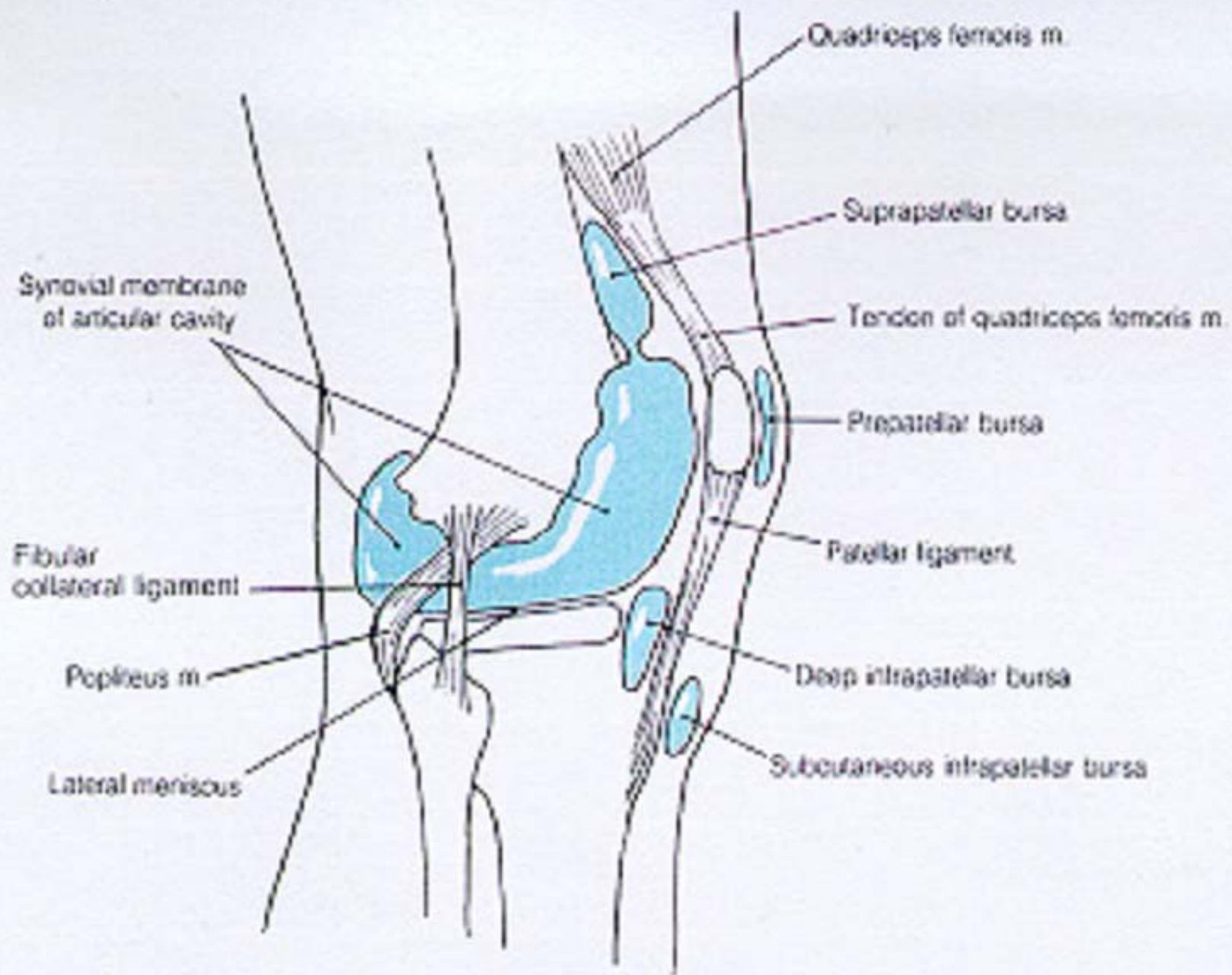
Suprapatellar bursitis- sx: generalized swelling of the knee above and behind the patella. Suprapatellar bursitis is a common complication after knee surgery or trauma.

Infrapatellar tendon bursitis- sx: pain with complete passive flexion and pain with complete active extension due to pressure on the bursae. There are two portions of the bursae; one distal to patella and above tendon, one distal but behind the tendon. Cause is generally overuse.

Pes Anserine bursitis - sx: pain under the medial and distal insertion of the gracilis, semitendinosus, and sartorius. Resistive mm test to the above mm may cause irritation.

Lateral bursitis- sx: pain proximal to head of fibula caused by frictional forces between LCL (lateral collateral ligament) and other structures. It is difficult to differentiate from other problems.

Popliteal bursitis- sx: pain between the LCL and the popliteus tendon which is difficult to differentiate from popliteal tendinitis. Screw home mechanism must be examined with this problem.



Bursae Symptoms

Localized Inflammation

Warm to touch

Extra articular swelling

Tendinitis

Can occur at any musculotendinous or osteo tendonous junction of the knee and is usually associated with overuse or microtrauma.

Good basic anatomy and palpation skills are necessary to determine the structures involved. Isolated mm test also pin point the tendon involved.

Patellar tendinitis- sx: pain and swelling directly over the infrapatellar part of the tendon and the insertion of the tendon into the tuberosity. The injury is common in jumping athletes who stress the tendon with position and forceful quad contractions. "jumper's knee" This condition is very often associated with tight hamstrings. The harder the extension mechanism of the knee has to work, the the pressures on patellar tendon increase and as a result of the over use, tendinitis results. Always have patients stretch their hamstrings.

Popliteus tendinitis- sx: pain in posterior-lateral aspect of knee with increased pain on terminal knee extension and foot internal rotation. Overuse causes include forced rotation of the knee and down hill running.

Pes Anserine tendinitis- sx: pain distal and medial on the knee at the tendinous insertion of gracilis, sartorius, and semitendinosus.

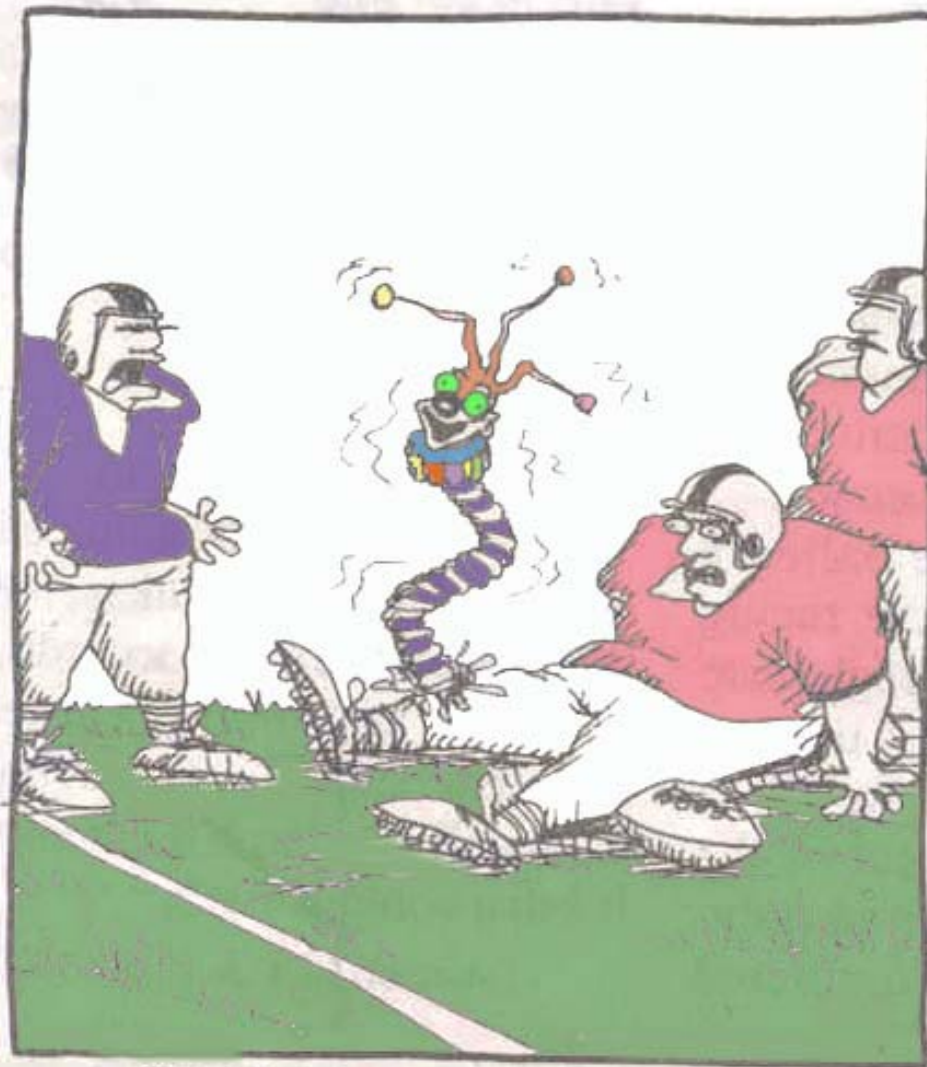
Iliotibial band tendinitis - sx: diffuse pain and tenderness on the lateral side of the knee usually where the it band rubs over the lateral epicondyle. Associated signs are a cross over running style, strong adductors and tight and/or weak it bands. "runner's knee"

Hamstring tendinitis - sx: pain and tenderness over the insertions of any of the three heads of the hamstring. Crepitus and swelling can be felt with deep palpation of the tendons and mm tests are painful.

Gastroc tendinitis - sx: pain in the posterior aspect of the knee associated with either head of the muscle. Remember to control ankle movement when isolating the pain.

Baker's cyst

sx: dull aching pain and full feeling behind the knee due to an inflammation of semimembranosus tendon or the medial gastrocnemius bursae. In more advanced stages there is a palpable lump in the popliteal fossa, sometimes due to the herniation of a tendon sheath. A Baker's cyst is often *indicative of underlying pathology* such as an old meniscal lesion.



"His trick knee popped out again."

Patella and Patellar Tracking Problems

Chondromalacia

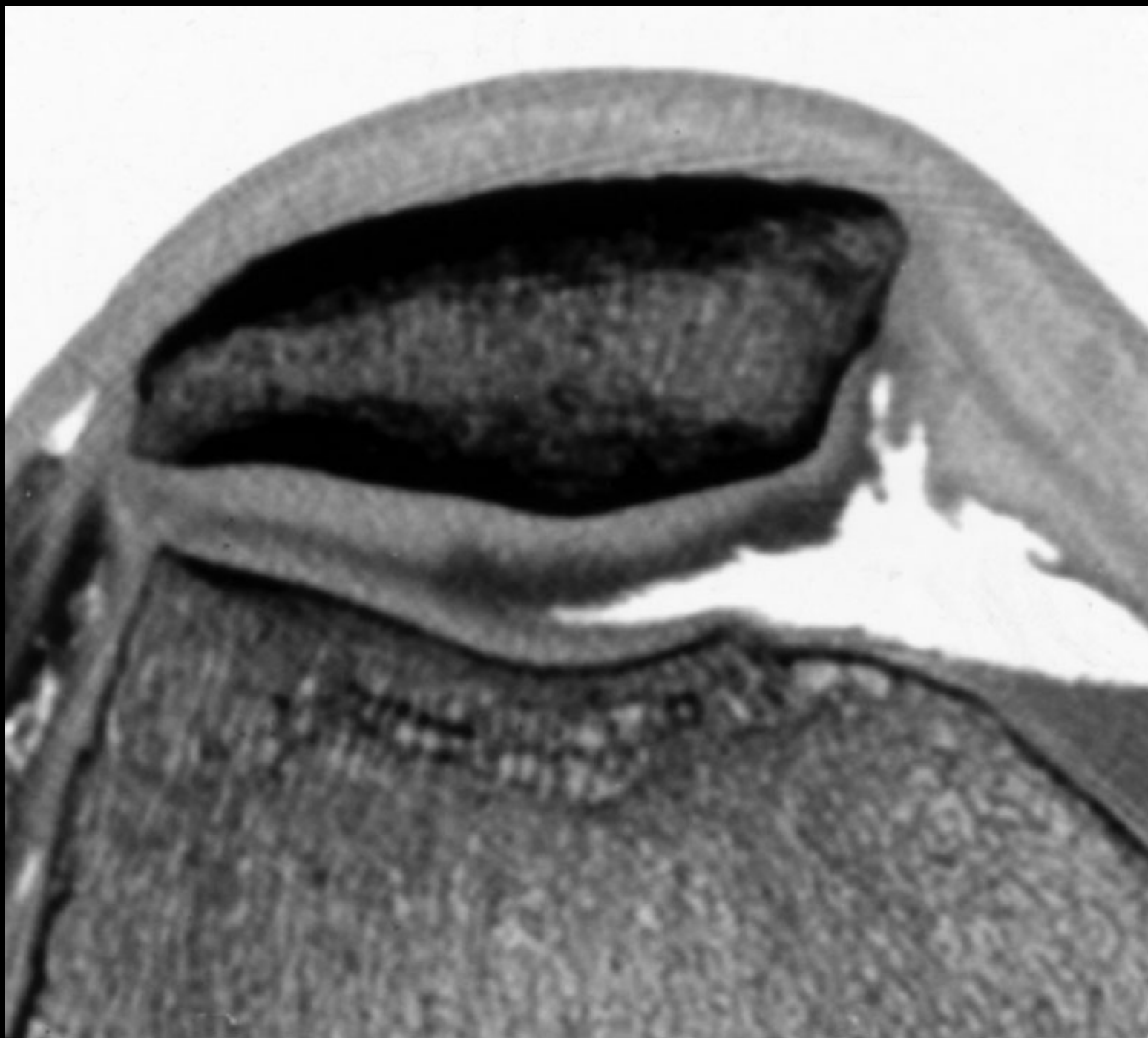
sx: pain underneath the patella with possible popping or crepitus especially in the 60-90 degree ROM. Direct pressure may elicit the pain; lateral patellar play, stairs and prolonged sitting are also problems. Causes include large Q angles, laterally riding or subluxating patella's, overuse, and mm imbalance.

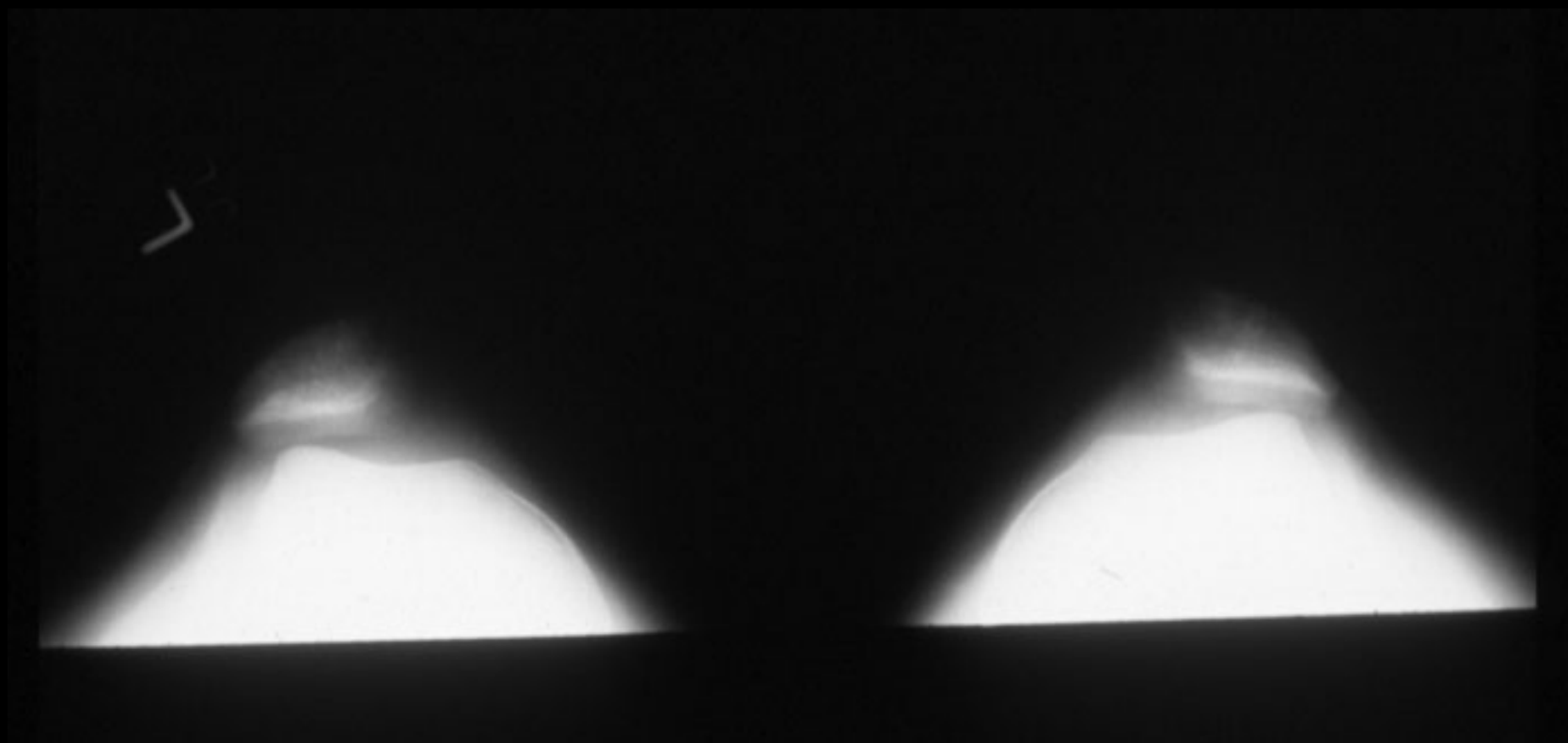
Subluxating patella

sx: giving way sensation, popping, local tenderness and a positive apprehension test. Causes include contraction of quad with a medial blow or externally rotated foot, small lateral condyle, tight lateral retinaculum.

Dislocating patella

sx: if the patella is out, the knee is severely deformed, painful, flexed, and patella is normally on the lateral side of the knee. Causes are the same as above.





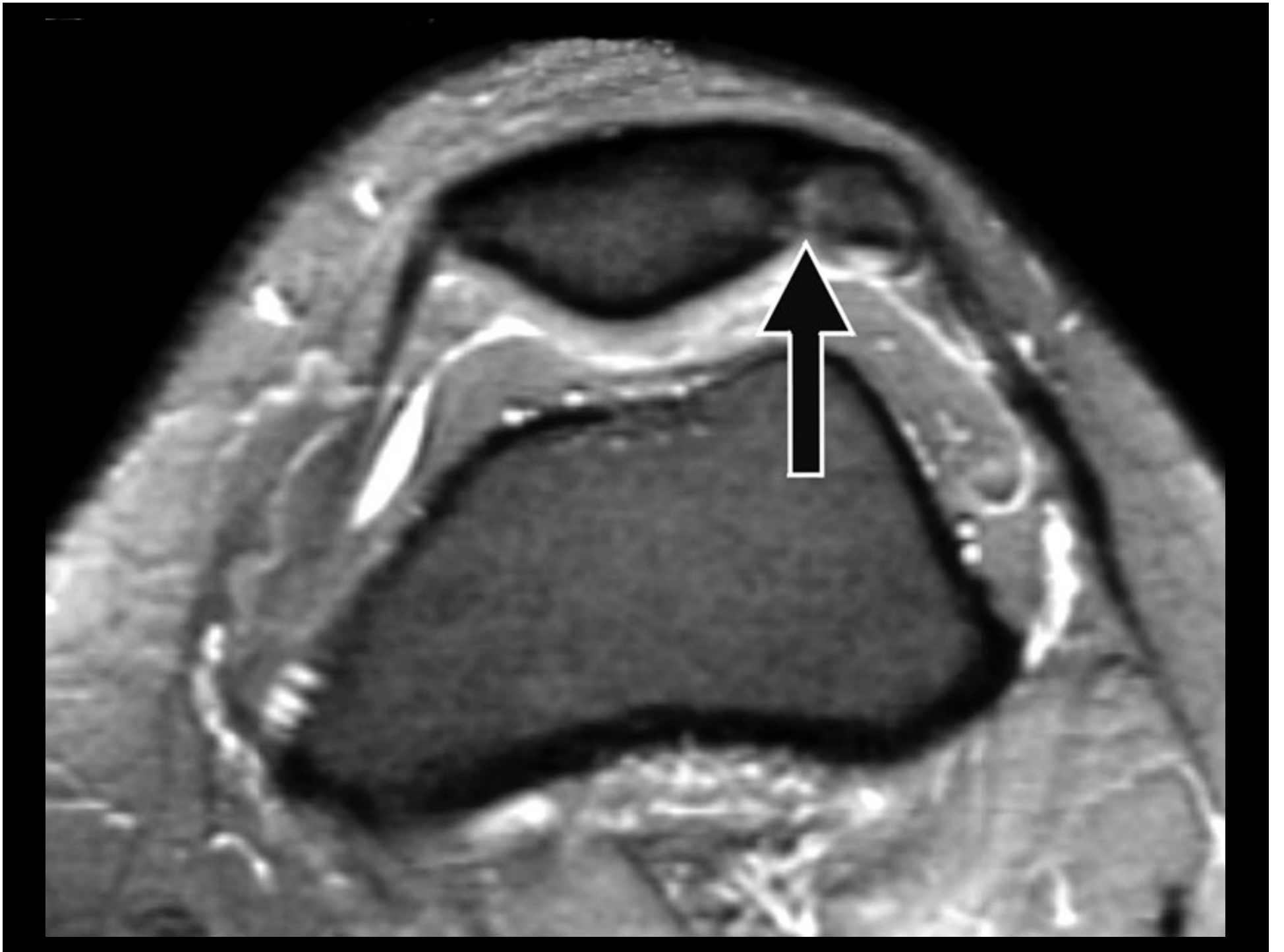
Fractured patella

Limited ROM and localized edema









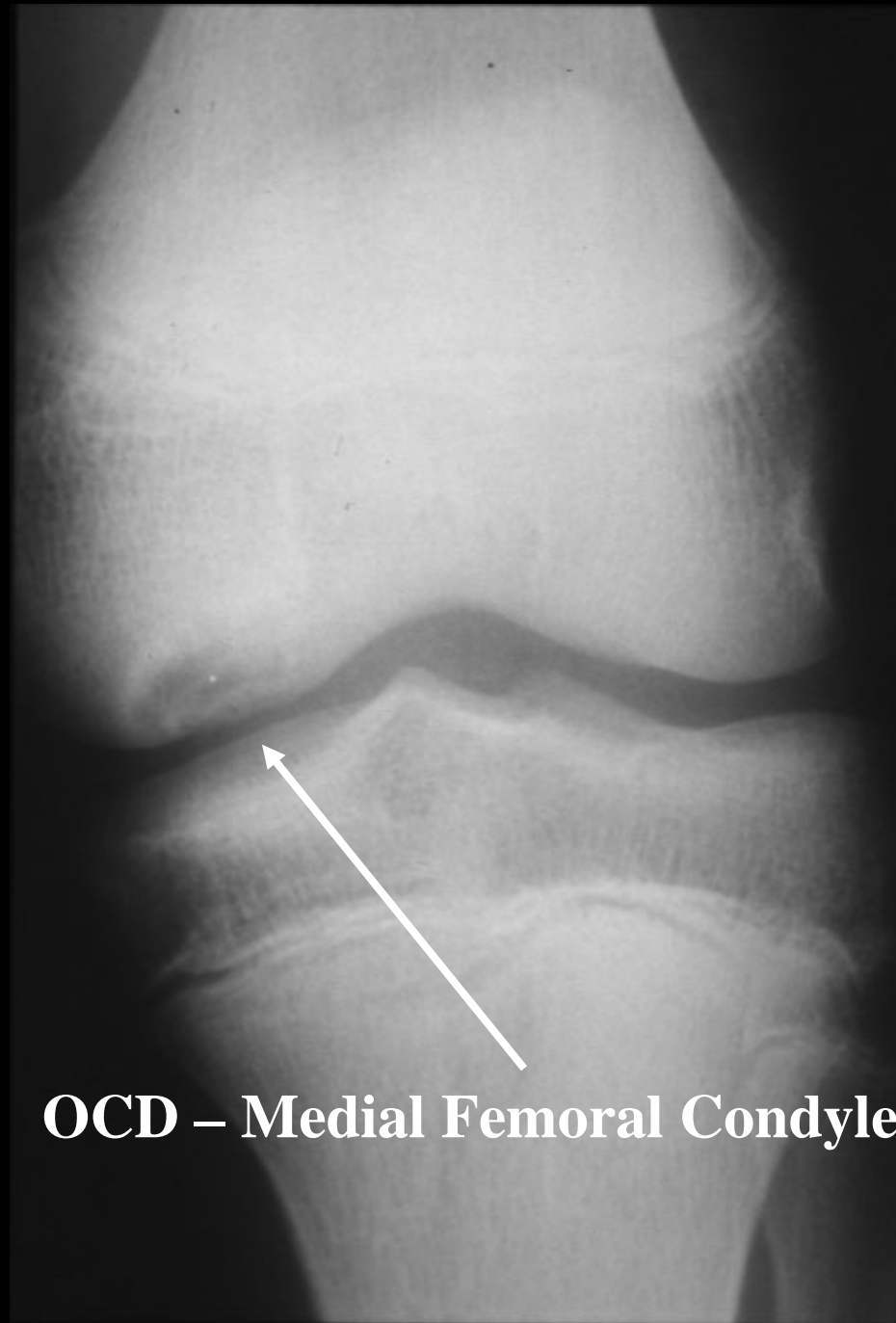
Notes

Research shows that approximately 50% of patients with patellar fractures have some limitation of function following the fracture healing and or surgical repair.

Research shows that less than 1% of bone – tendon – bone ACL autograph patients have patellar fractures following surgery

Bony Problems in the Knee

Osteochondritis dissecans- sx: generalized and nonspecific pain and discomfort after activity, intermittent swelling, giving way and instability. The pain is due to a slight excavation of bone on the articular surface secondary to trauma and compromised blood supply. Special test include x-rays and Wilson's test where foot is internally rotated and knee is extended the last 30 degrees under valgus stress.



OCD – Medial Femoral Condyle

Se:2/2
Im:19/27
Sag L30.5

05/15/97
0813
MF: 1.2

A
5
7

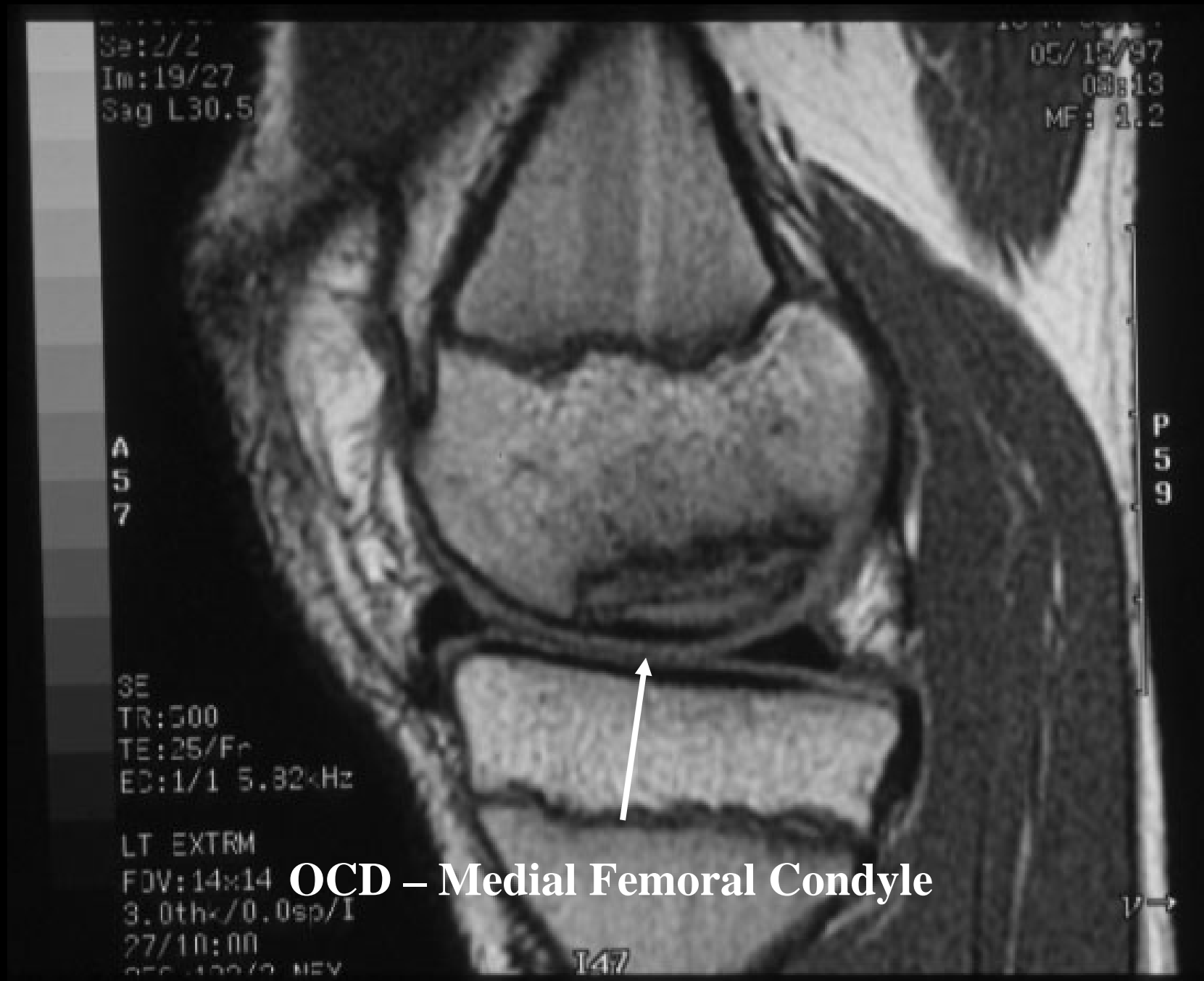
P
5
9

SE
TR:500
TE:25/Fc
EC:1/1 5.32kHz

LT EXTRM
FDV:14x14
3.0thk/0.0sp/I
27/10:00
070-100/0-NEV

OCD – Medial Femoral Condyle

147





Osgood-Schlatter syndrome

sx: pain and swelling on the tibial tubercle. X-rays show additional calcification if the problem is more than 6-8 weeks old.

Epiphysial plate fractures

sx: children under the age of 16 present with generalized knee pain with a common fracture at the medial epicondyle of femur or medial plateau of tibia. Stress x-rays are necessary to help diagnose this serious injury.

Fractures

May occur to any of the four bones associated with the knee joint. Know your bony land marks and recognize the swelling, pain, and limited ROM as indicators possible fractures.



14 y.o., 230 lbs with a tibial tubercle fracture.
The quadriceps tendon attachment was stronger than the bony attachment.
This type of injury is very age specific.
An injury of this type would be uncommon in the collegiate or professional aged athlete.



What's the Injury ?



Tibial eminence avulsion



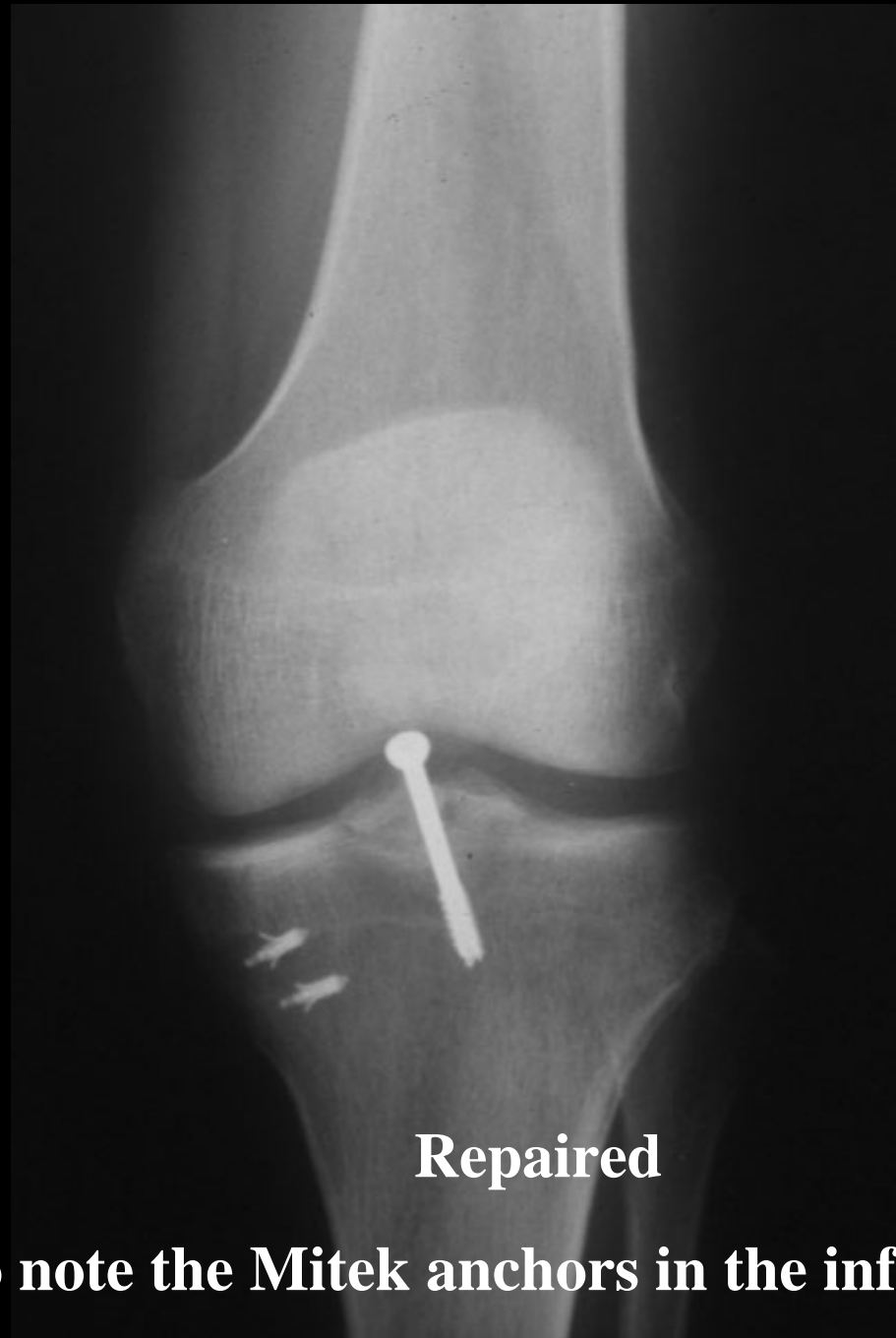
Lateral View

RODRIGUEZ, JOSE LUIS
22679/28V/M

DR J MILNE
LEFT KNEE

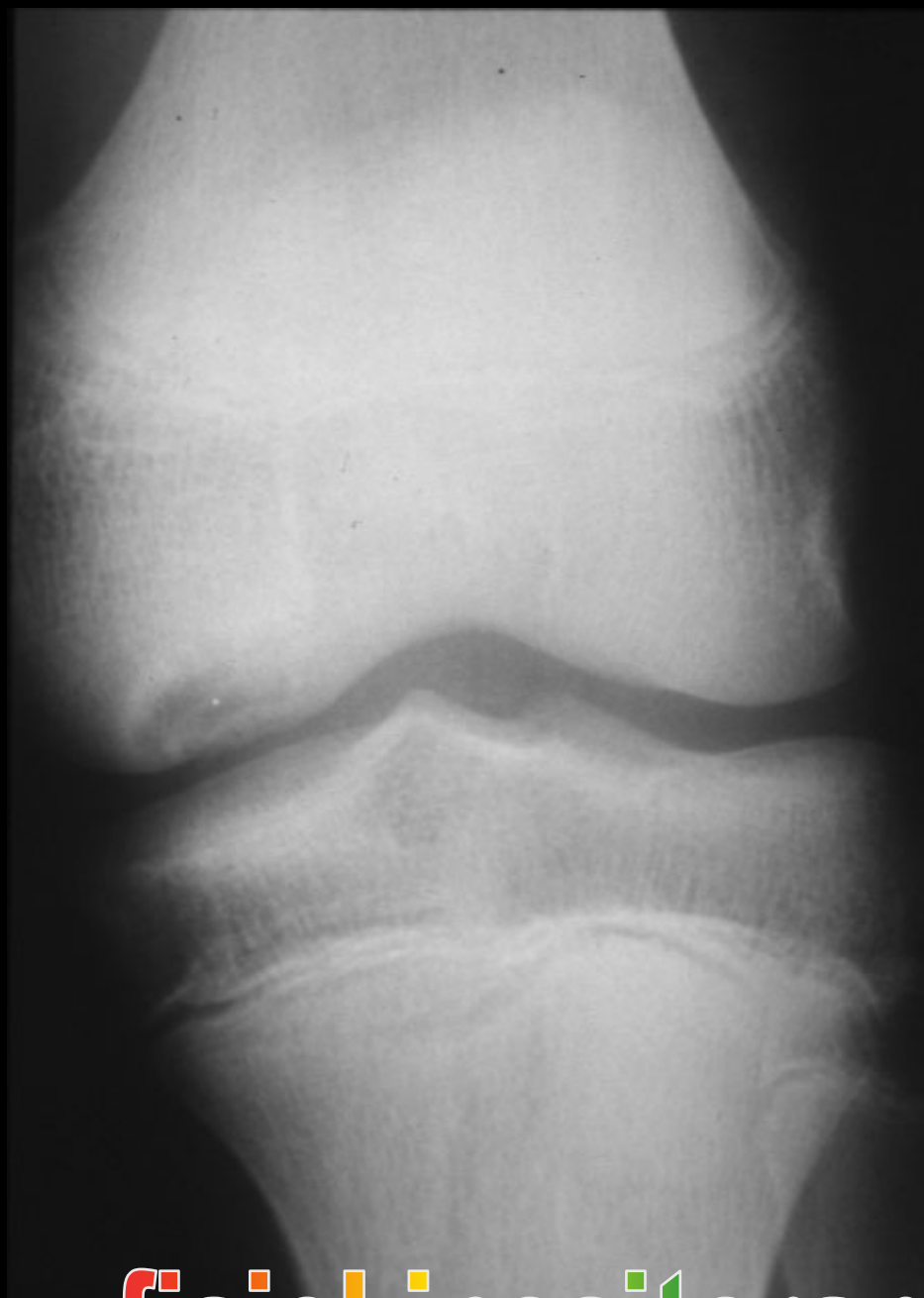


MRI of the same tibial eminence frx.

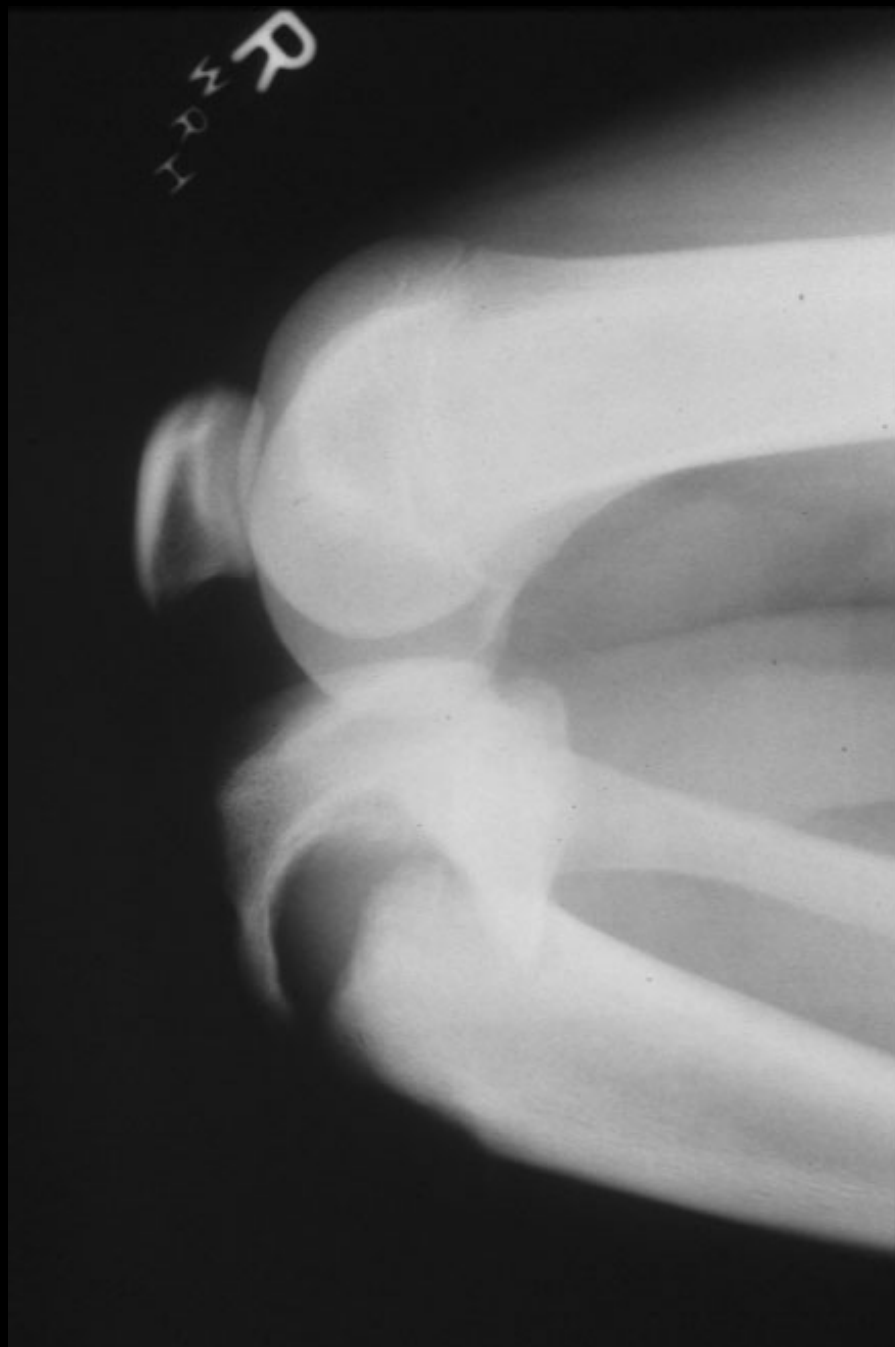


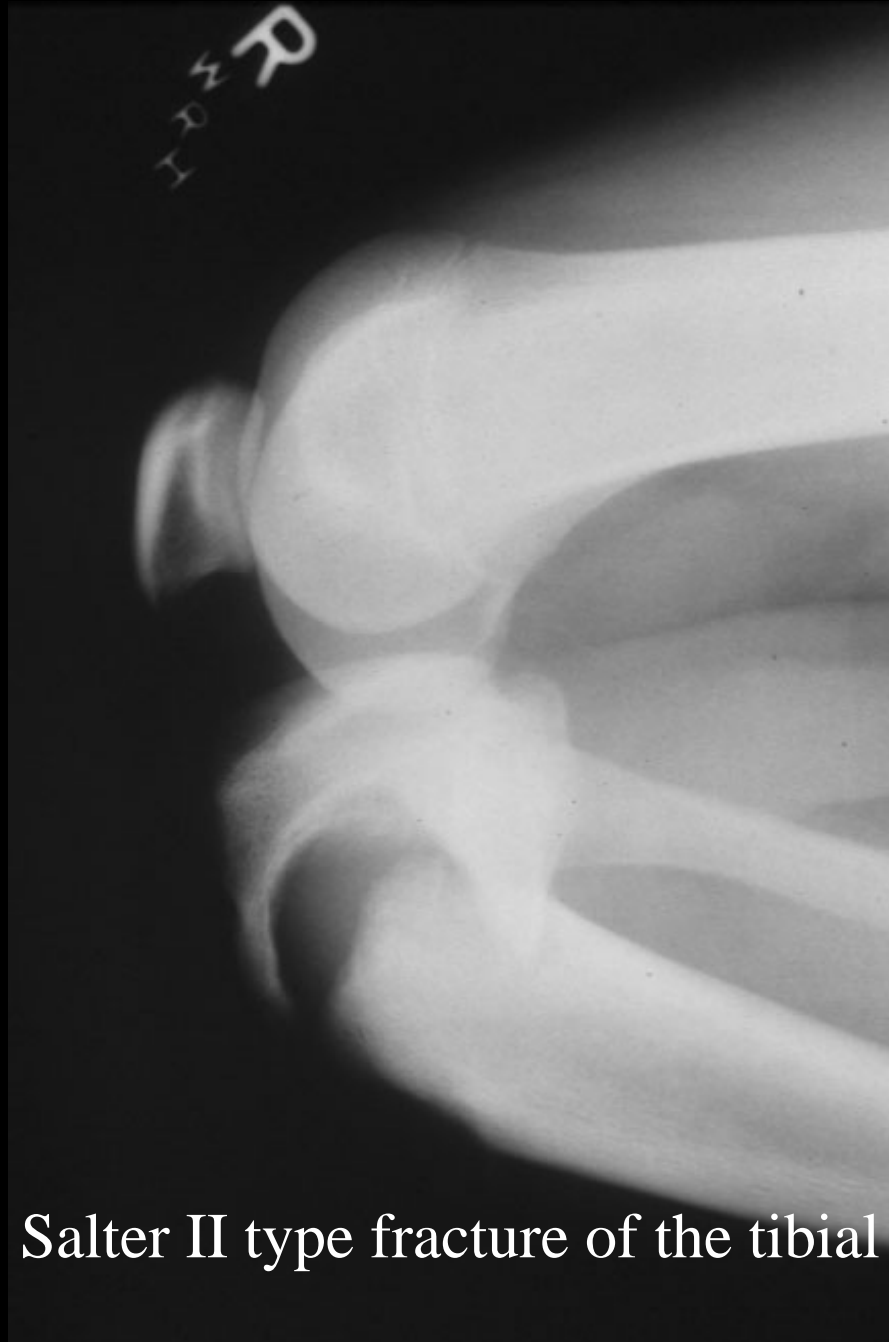
Repaired

Also note the Mitek anchors in the inferior MCL



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14 y.o. Salter II type fracture of the tibial tubercle



Repaired – Lateral View



Repaired – AP View





Tibial Tubercle avulsion



Repaired

Bony blocks or bone spurs

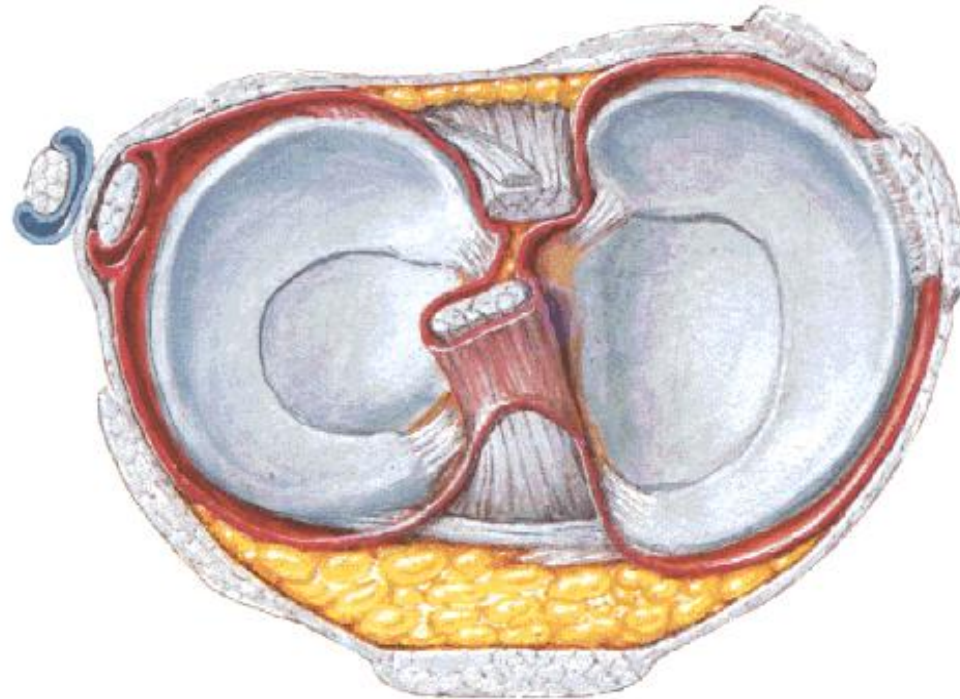
sx: usually pt. has a Hx. of trauma or avulsion and the recalcification process has produced an extra amount of bone. Such spurs are also more common in arthritics. Some spurs are palpable, if they have reached this stage they are a serious problem.

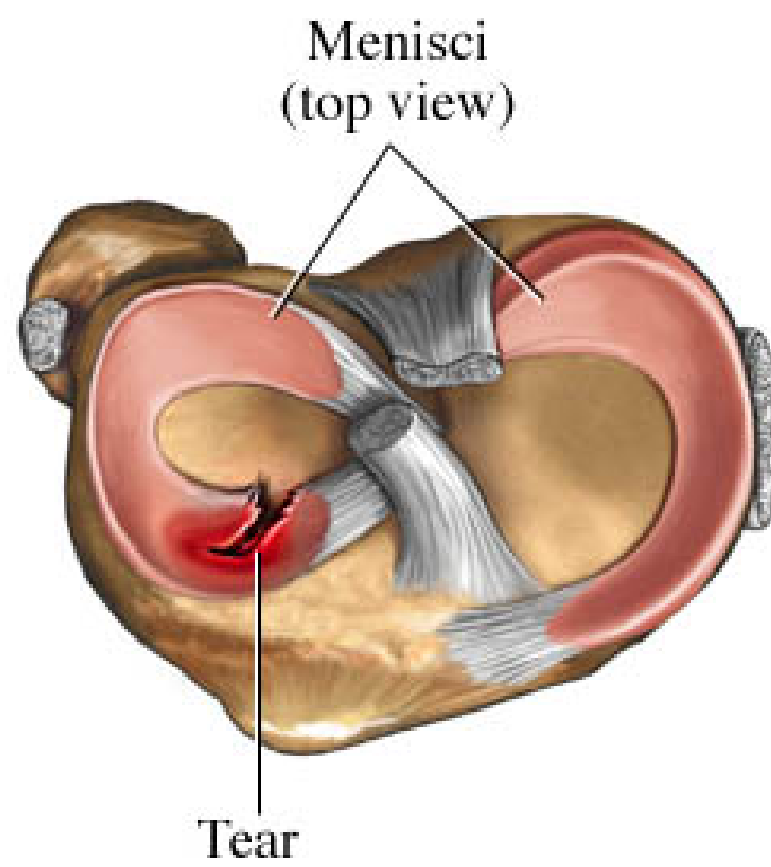
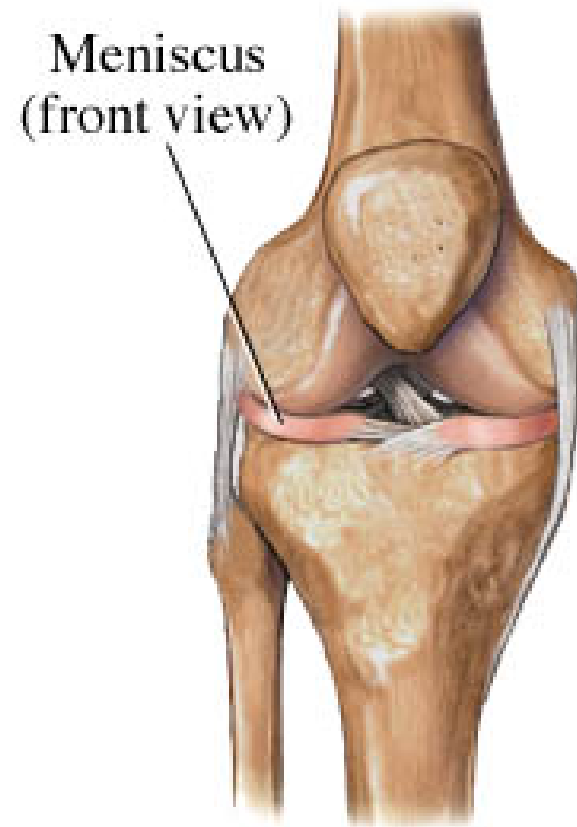
Meniscal Injuries

Medial and lateral menisci in the knee may be pathological producing locking, catching, swelling, weakness and pain.

Types of tears -bucket handle-transverse -peripheral -beak tear

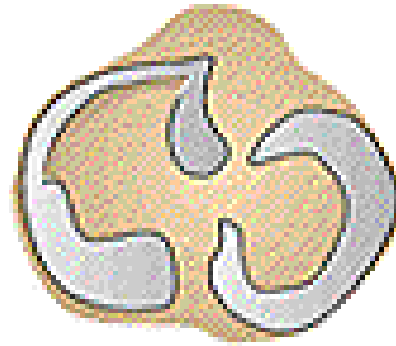
Special tests- McMurray, Apley's compression - hyper flexion or squat test







bucket handle
tears

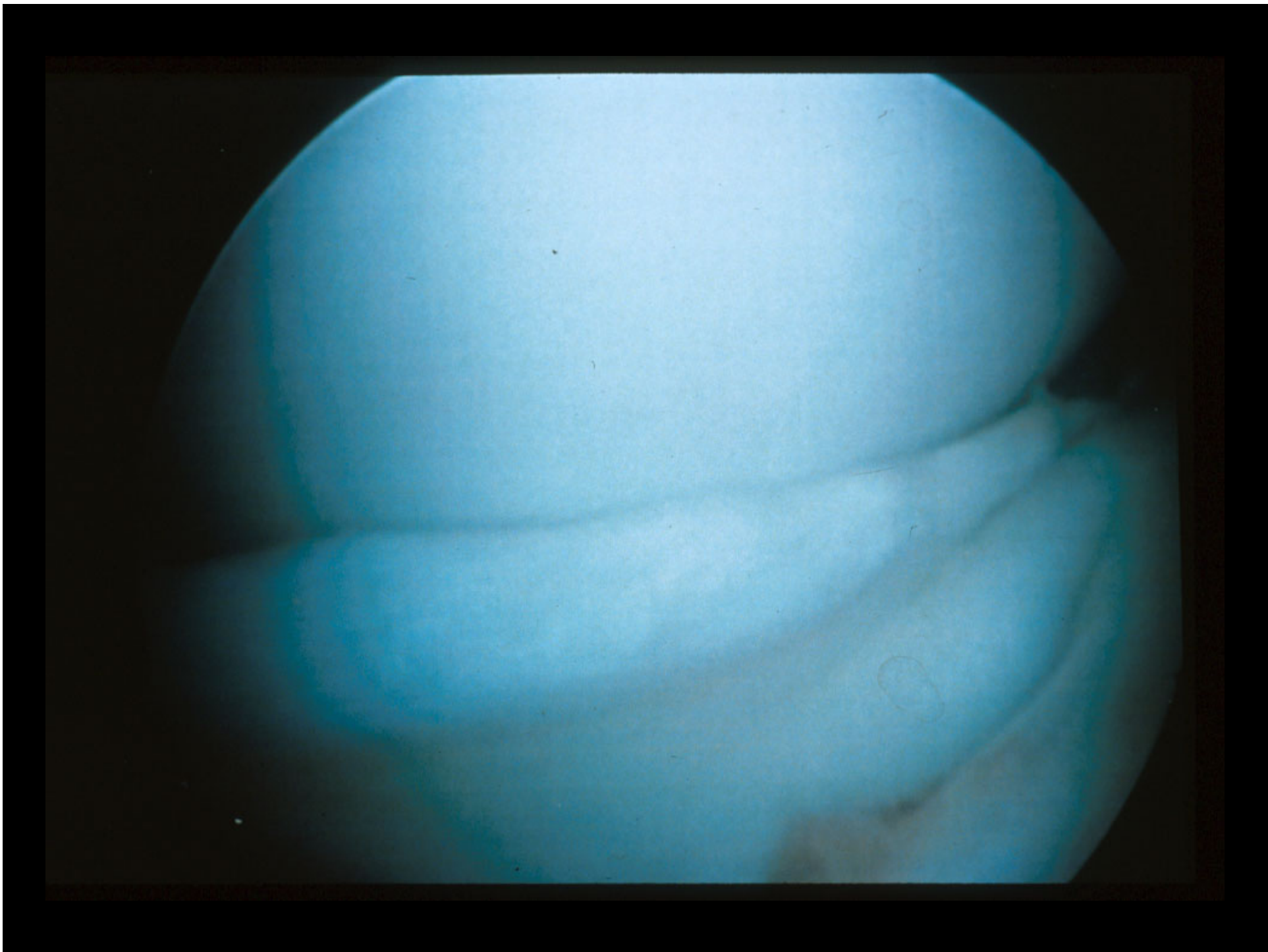


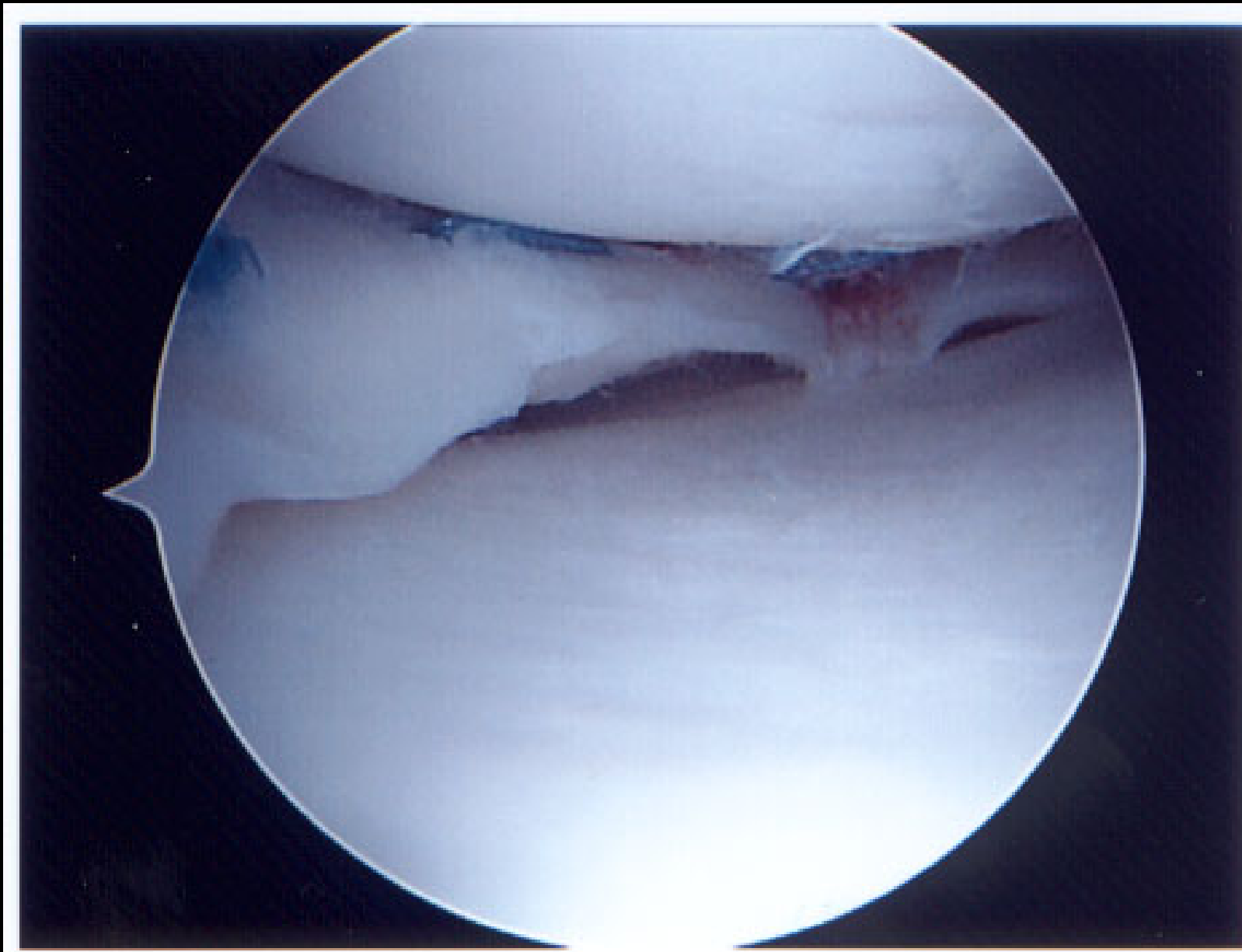
anterior horn
tears



posterior horn
tears

Common Meniscal Tears









Ligamentous Injuries



“Swollen knee? You call *that* a swollen knee?”

Ligament sprains / Tears

Ligaments are very painful injuries unless the ligament is a grade 3/3 at which point the ligament and its nervous supply are totally ruptured.

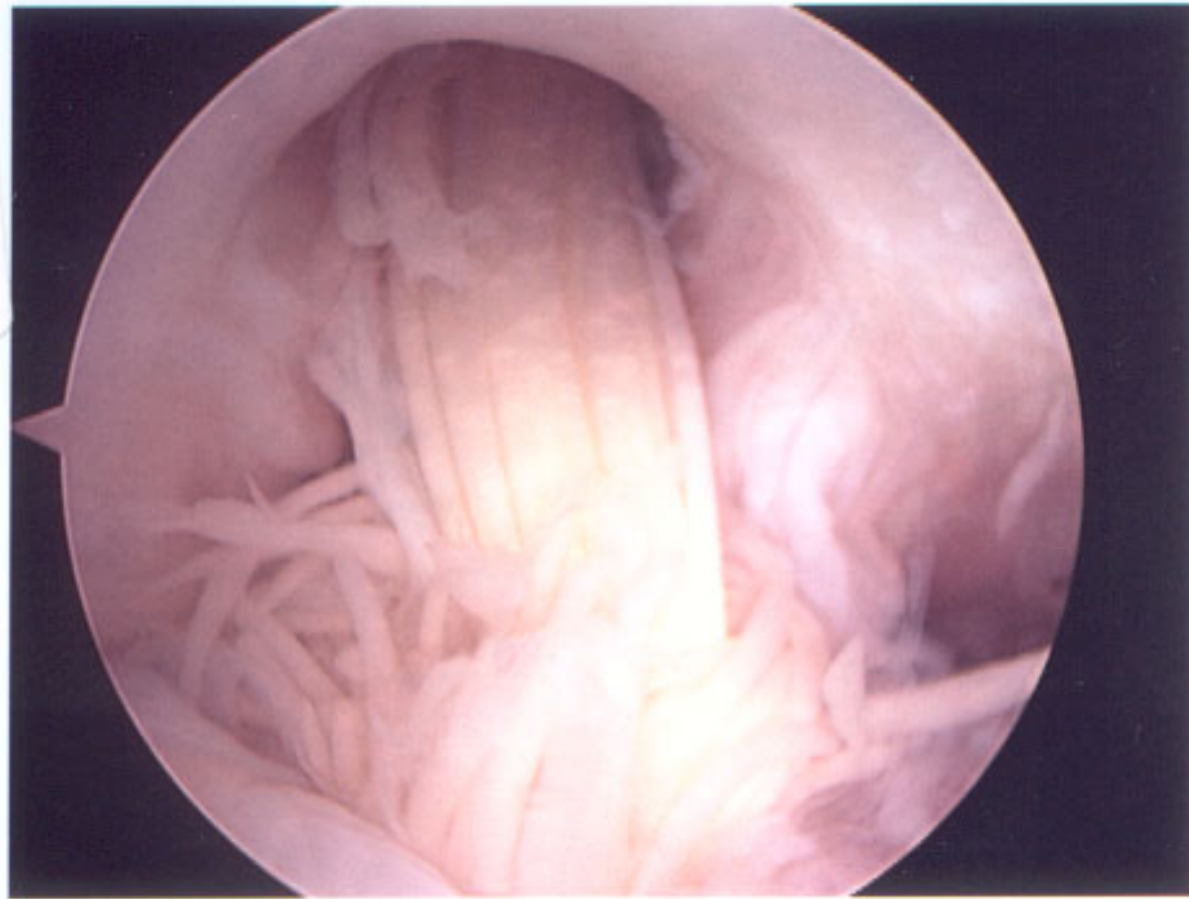
Symptoms –

Swelling and point tenderness accompanied by decreased ROM are all signs. A good history is also important.

Anterior Cruciate Injuries -

This injury has become a highly publicized injury to the knee. The ACL prevents anterior translation of the tibia in relationship to the femur. This injury is characterized by the patient feeling a "pop" in the joint when running, jumping or cutting.

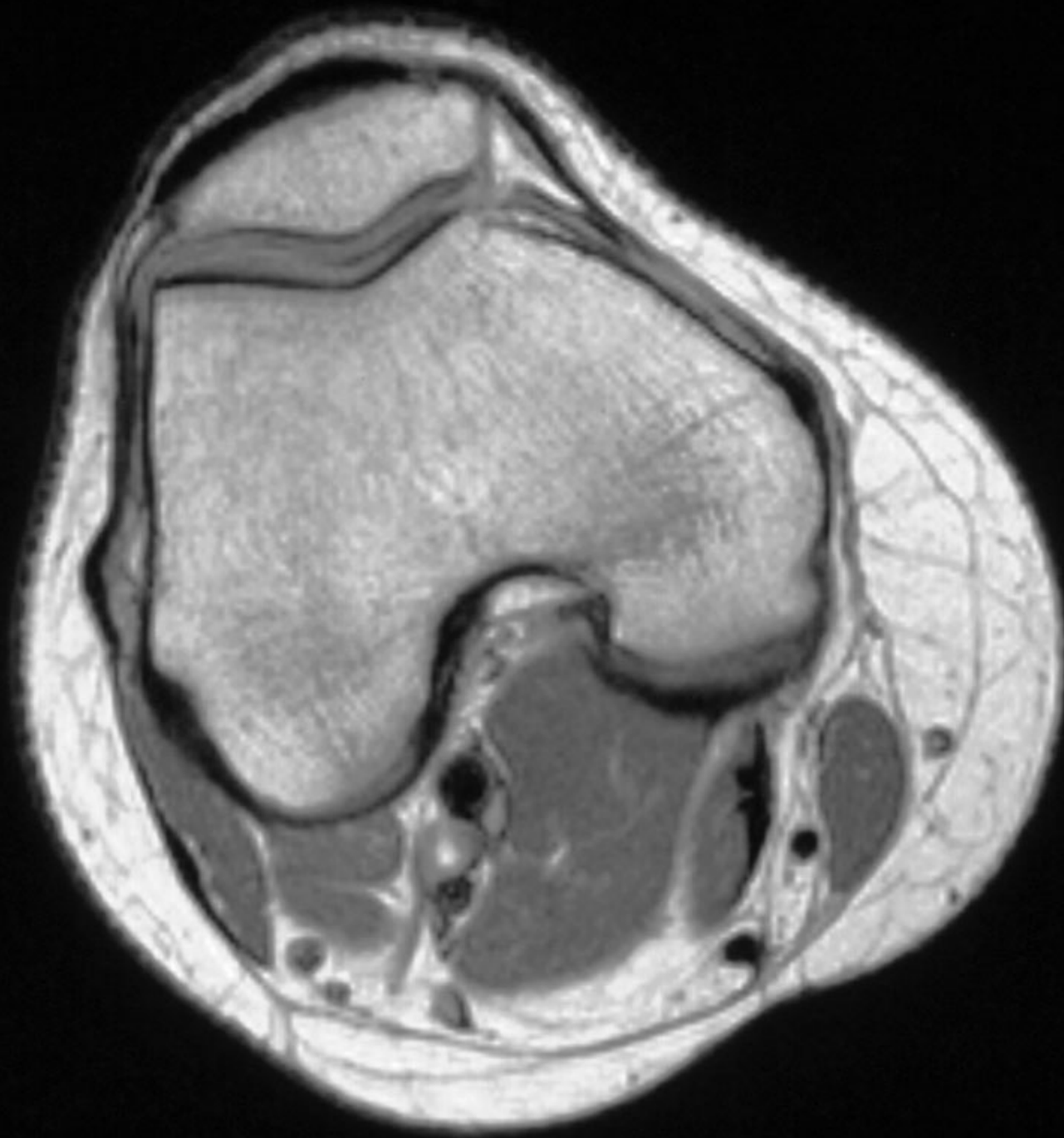




Gore Tex ACL Graft

Posterior Cruciate Injuries -

This is a fairly uncommon injury in athletics. The PCL functions opposite of the ACL in that it prevents posterior displacement of the tibia on the femur. This injury is frequently seen in motor vehicle accidents as a result of the knee impacting the dash board.







Im: 21/38
Sag L59.0

07/01/00
08:16
MF: 1.2

A
9
G

P
3
7

3E/V
TR:2500
TE:30
EC:1/2 10.7kHz

LT EXTRM
FOV:16x16
4.0thk/1.0sp
38/12:30
256x192/1.5 NEX
FC/St:SI/NP/VB/ED/SPF

180

- 3606 I - 2057



Medial Collateral Injuries -

Lateral Collateral Injuries -

O'Donahue's Unhappy Triad

The Knee is Swollen

Intra articular Swelling

Rapid onset of edema – less than 24 hours

Ligamentous

Fracture

OCD

Intra articular

Slow onset of edema

A slow onset is usually indicative
of a meniscal lesion

Extra Articular Swelling

Bursal edema

Patellar – femoral

Soft tissue contusion

Medial or lateral collateral ligament
trauma

Fluid Types

If the intra-articular swelling is aspirated by a physician and the color of the fluid is:

Bloody – ligament, OCD, fracture

Serous sanguineous – serous fluid with some blood – new meniscal injury, small OCD

Serous – chronic irritation, old meniscus tear