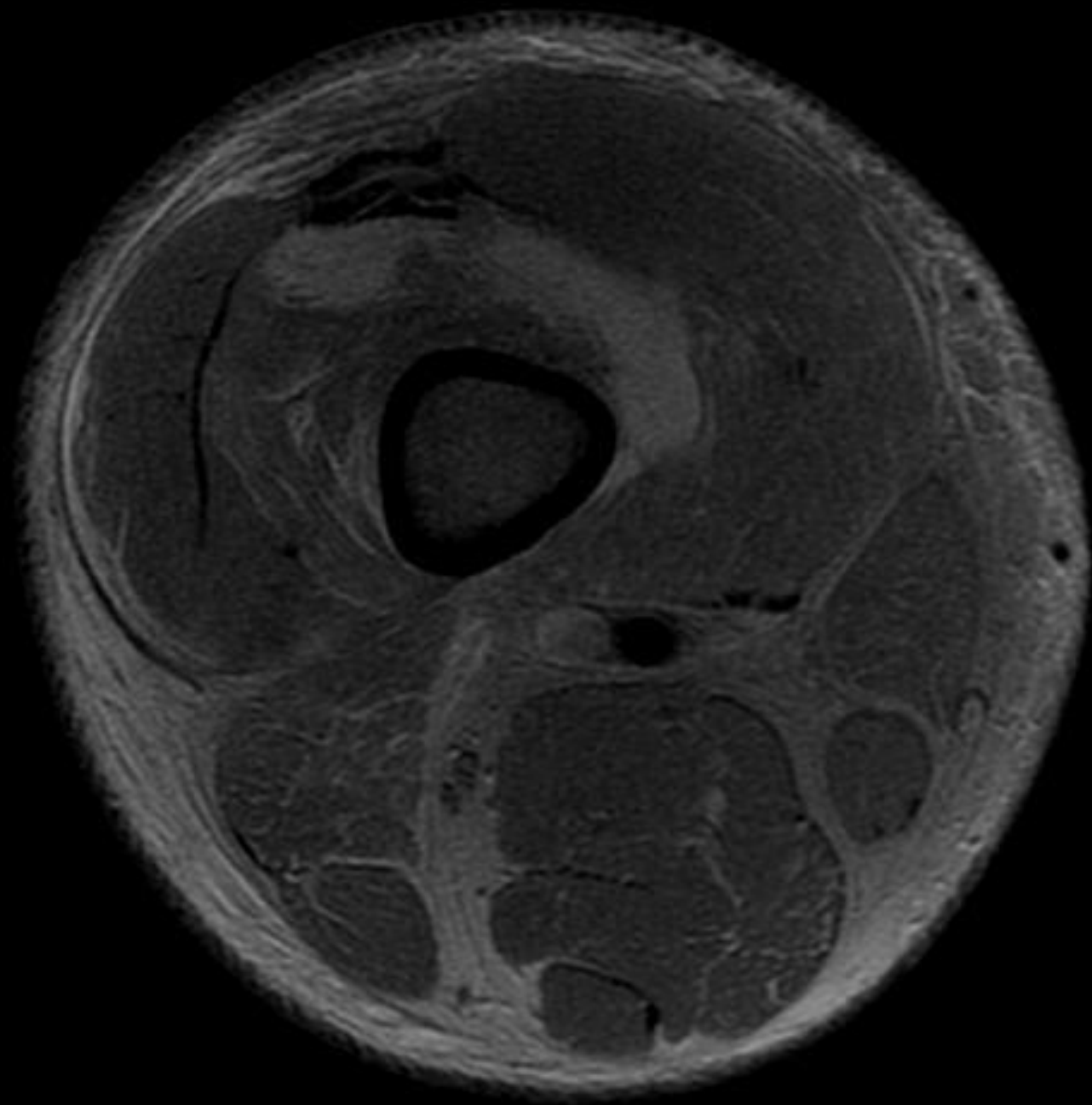
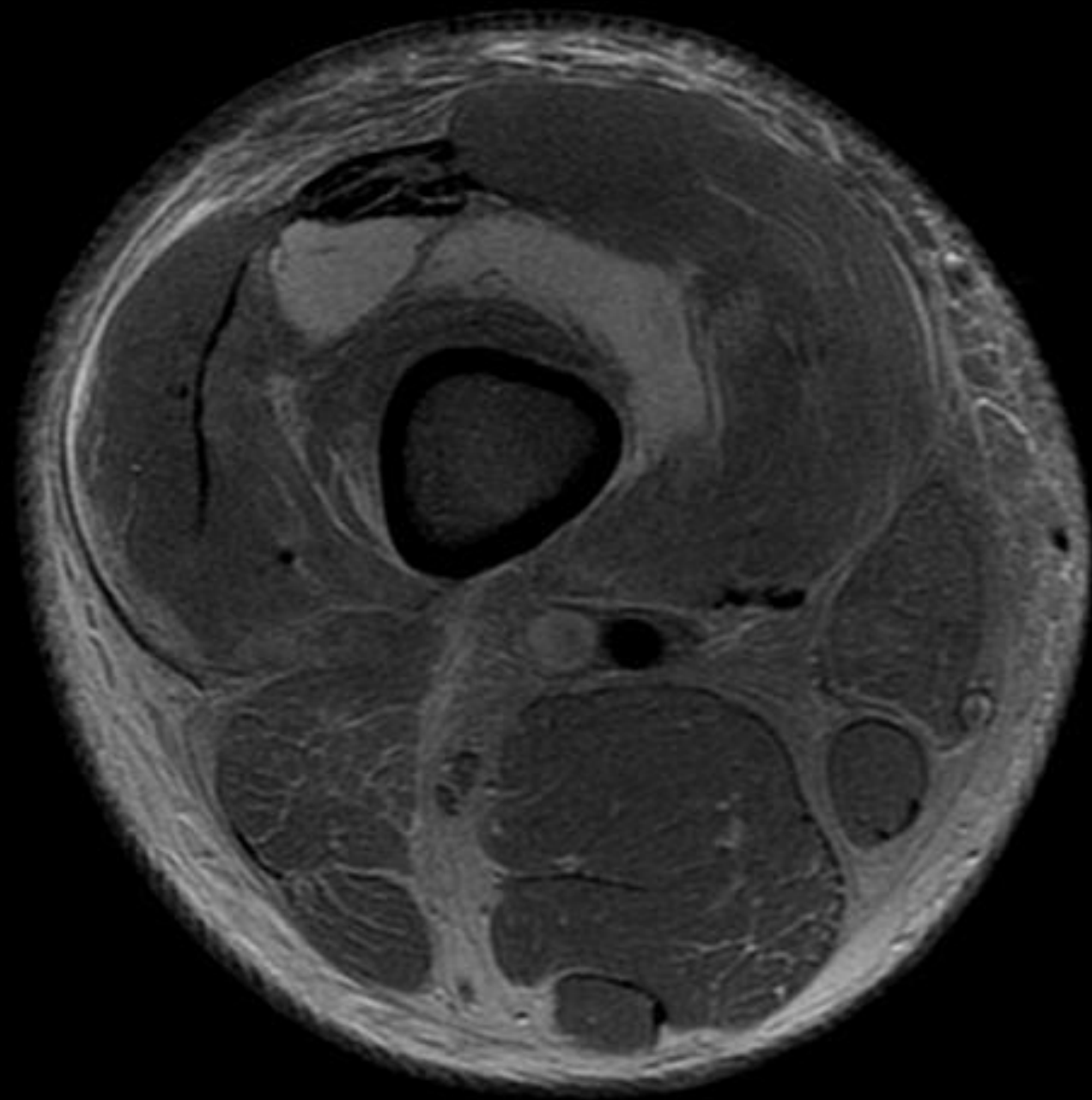
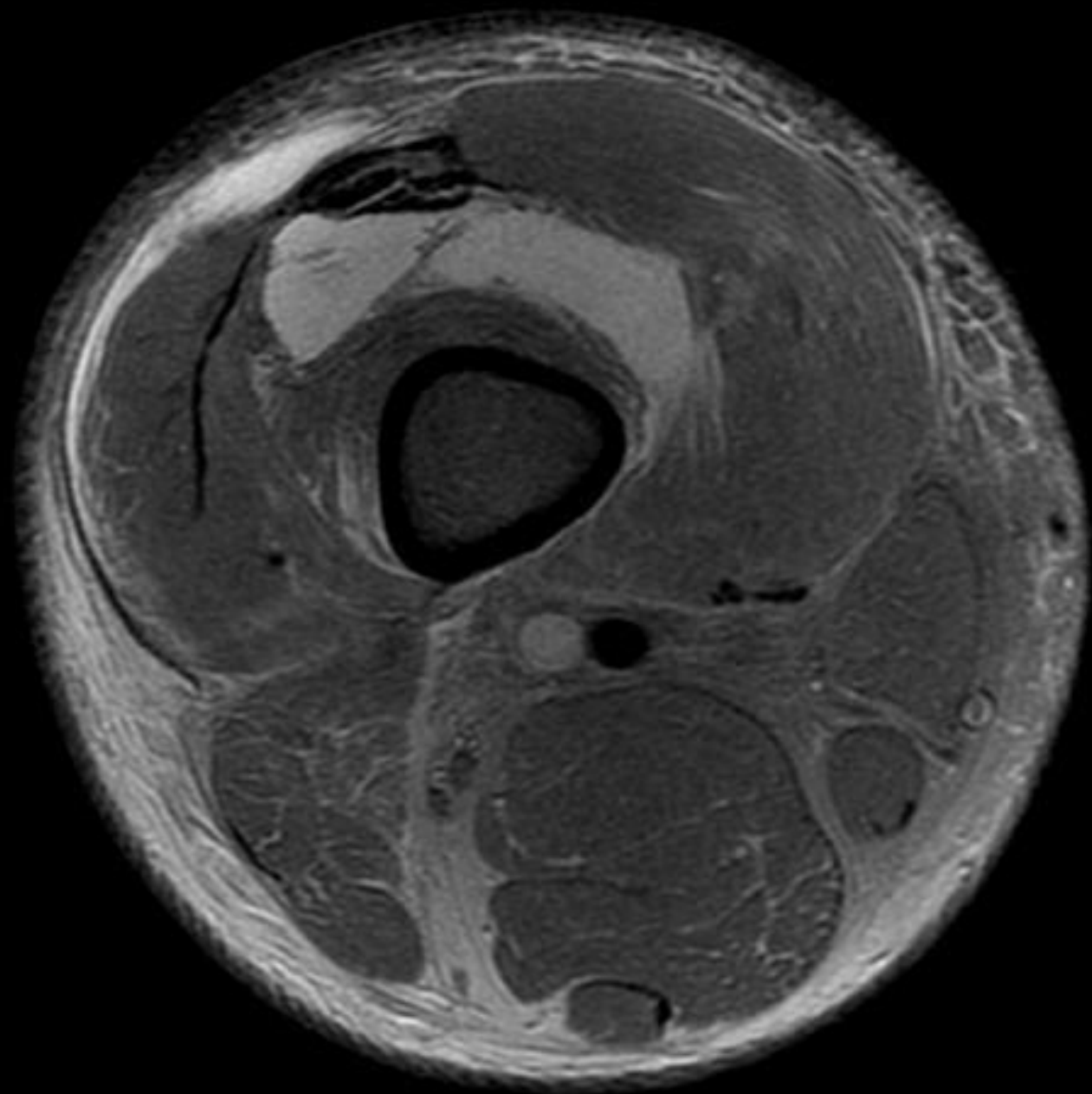


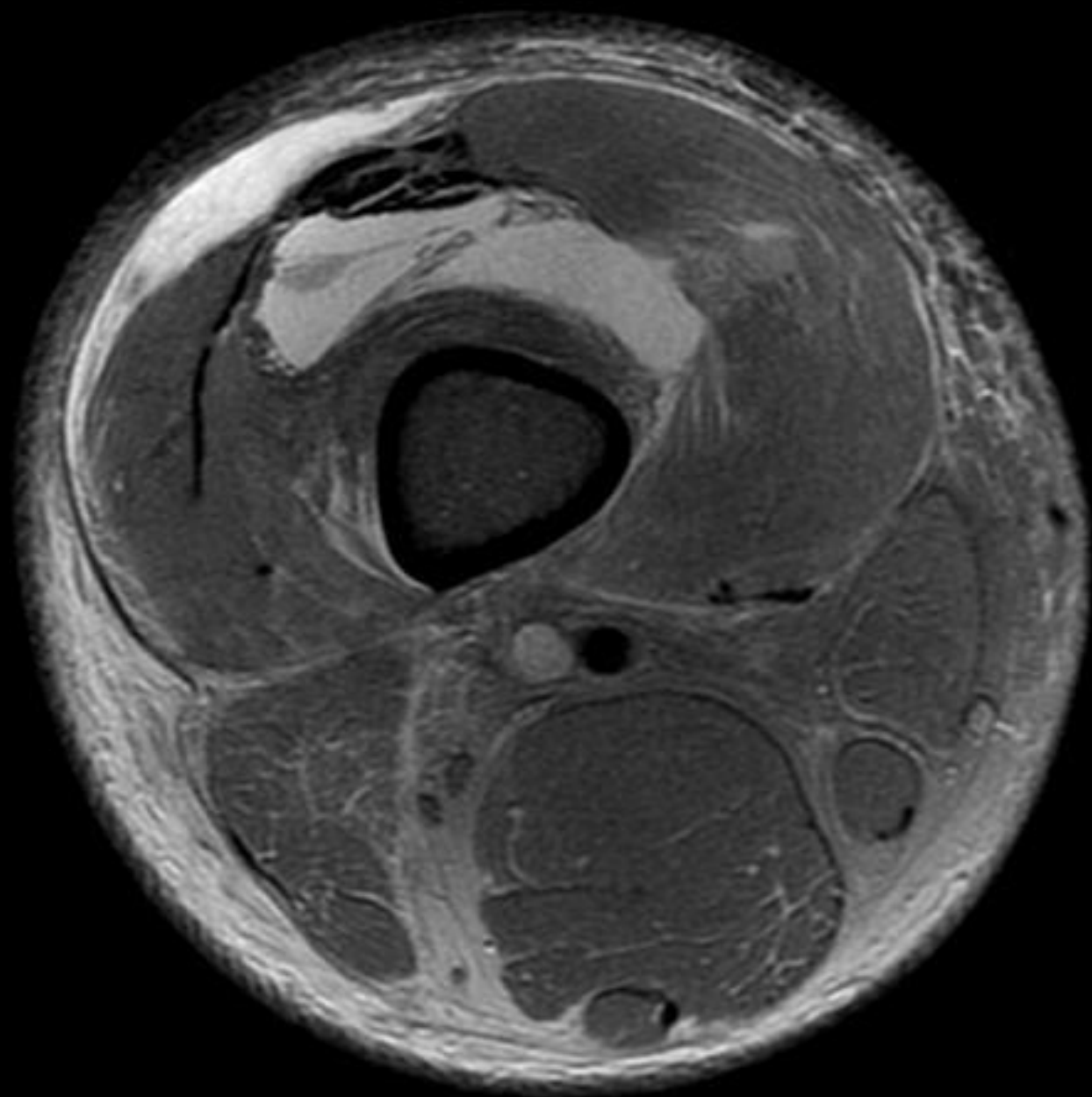


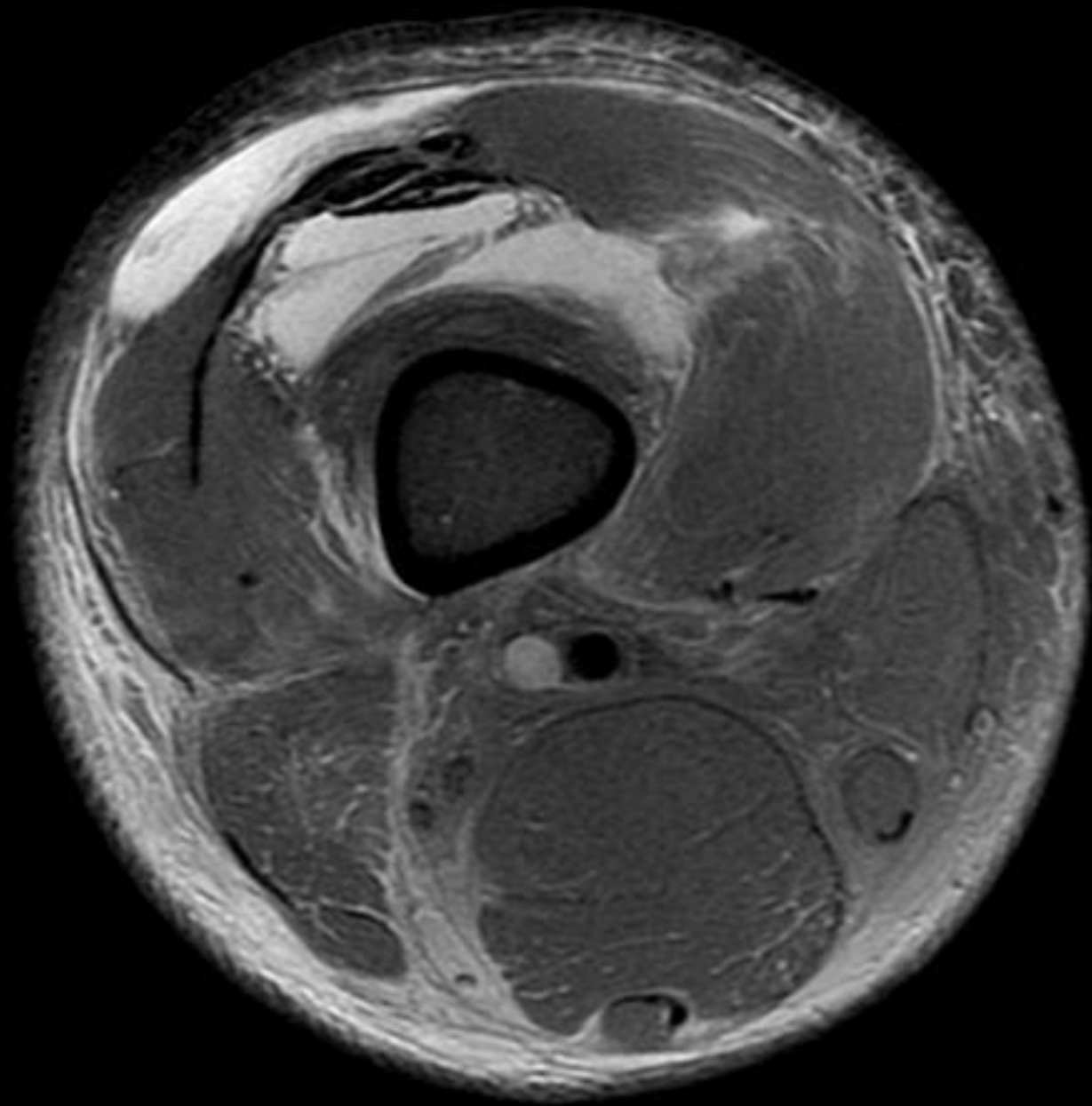
33 year old male whose knee
gave out at work

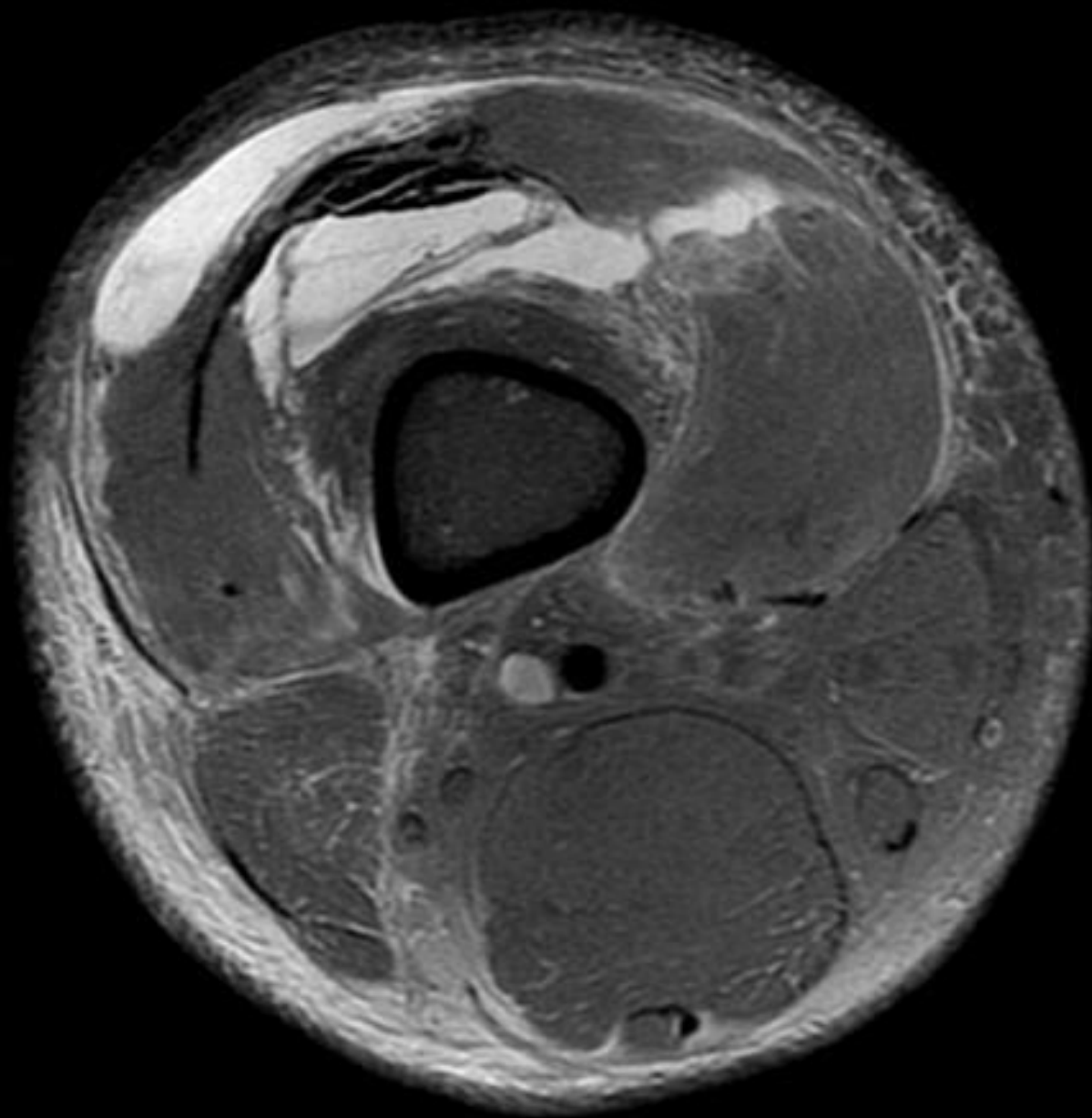


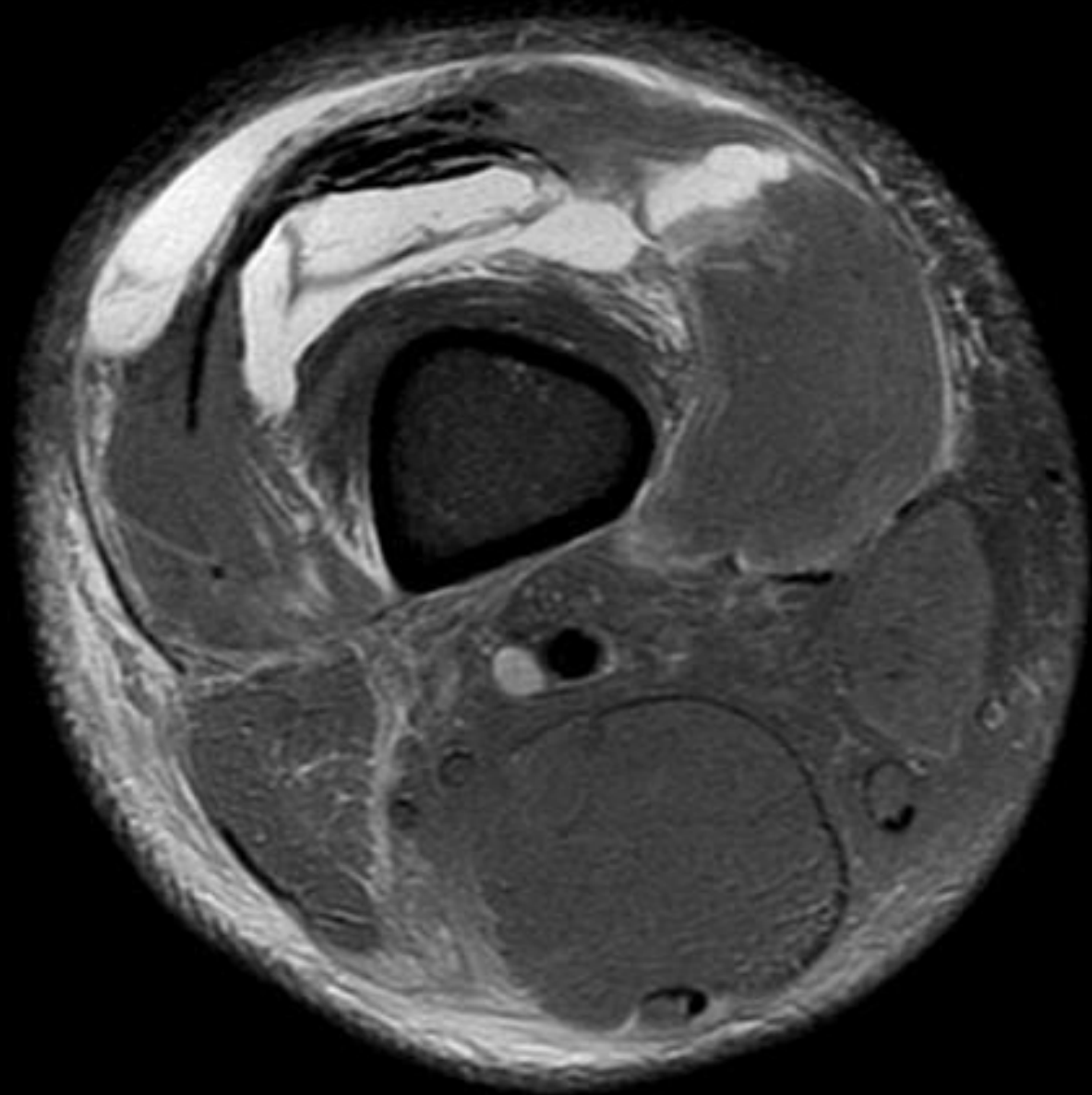


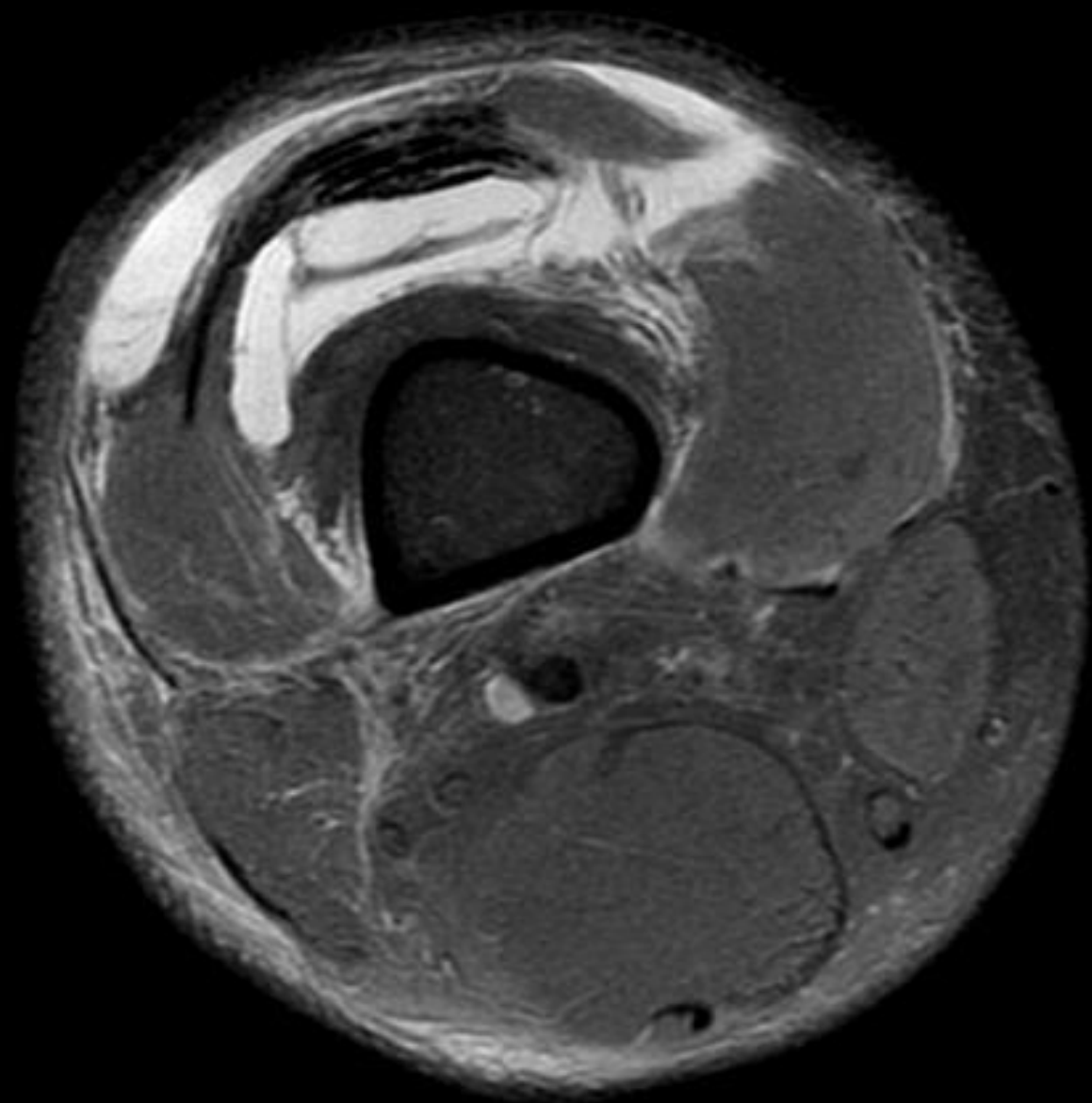


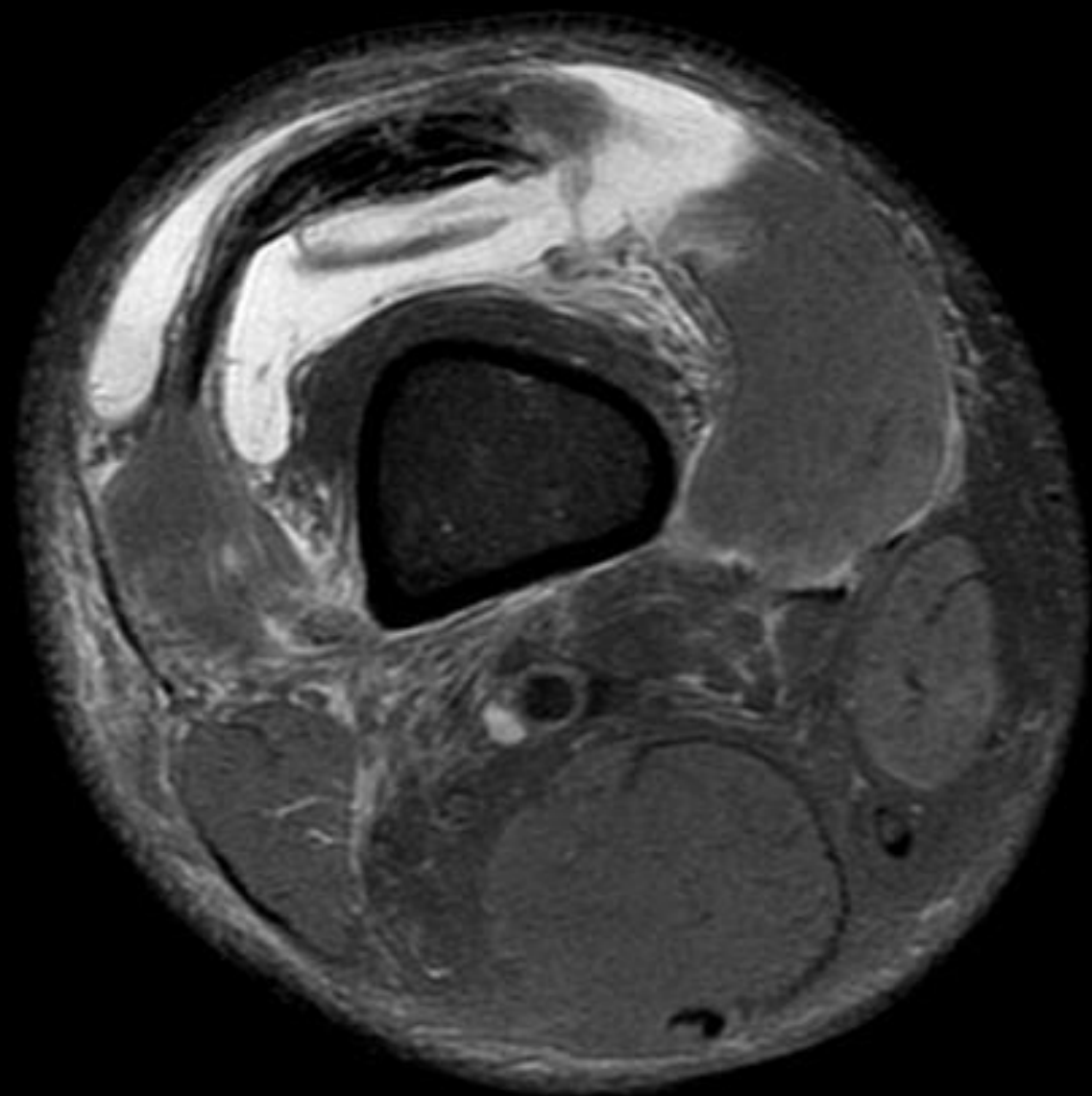


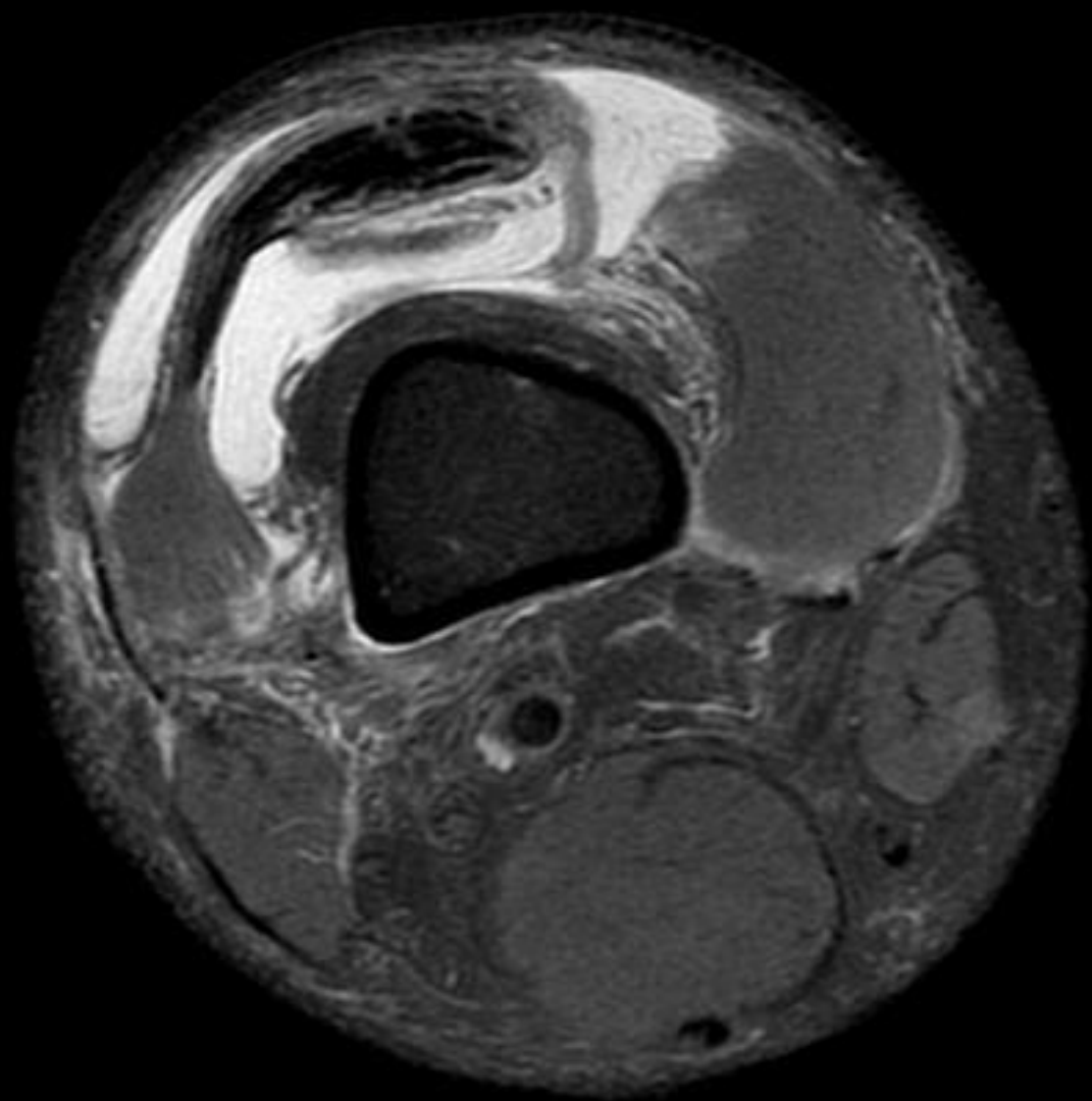


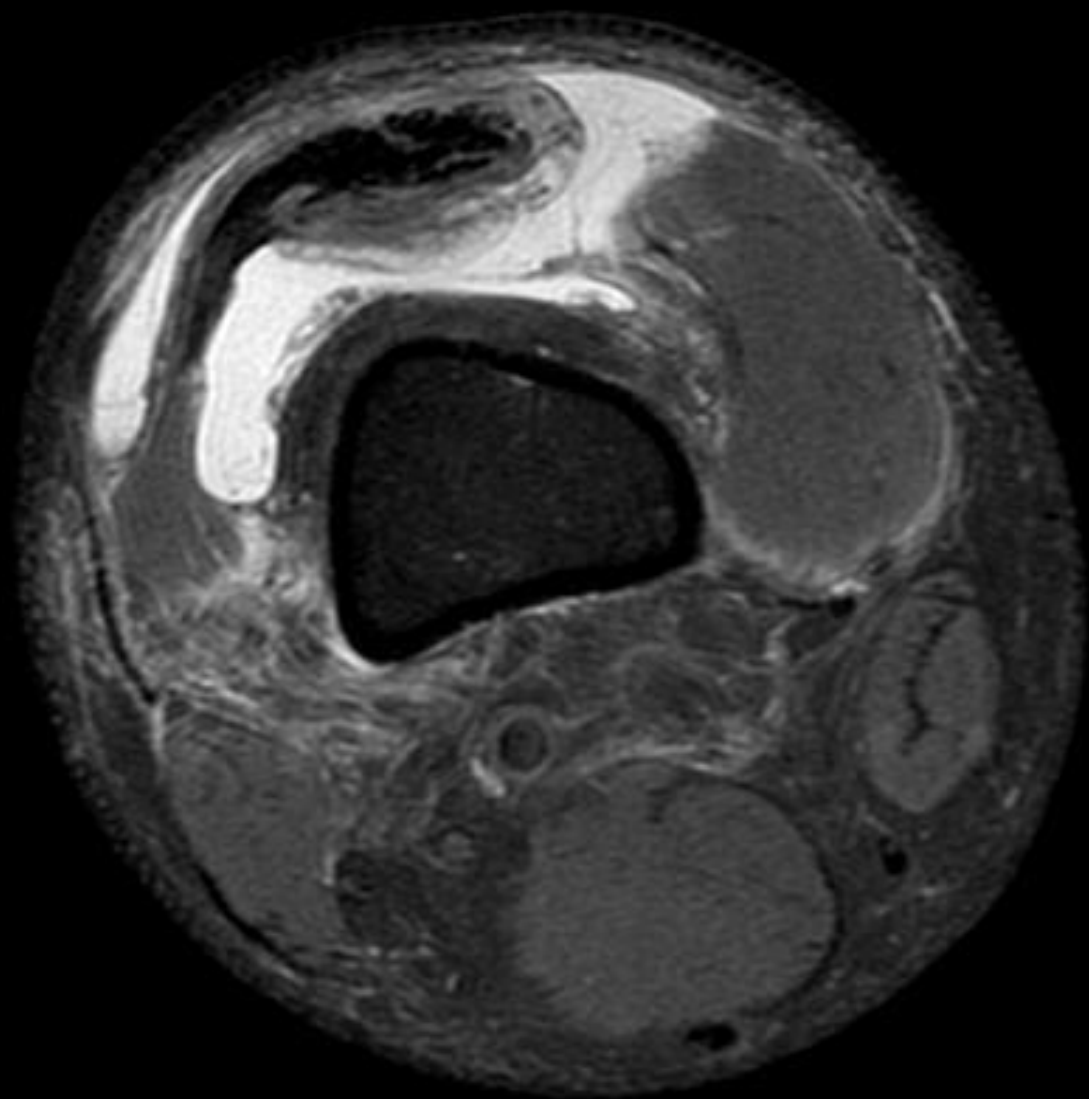


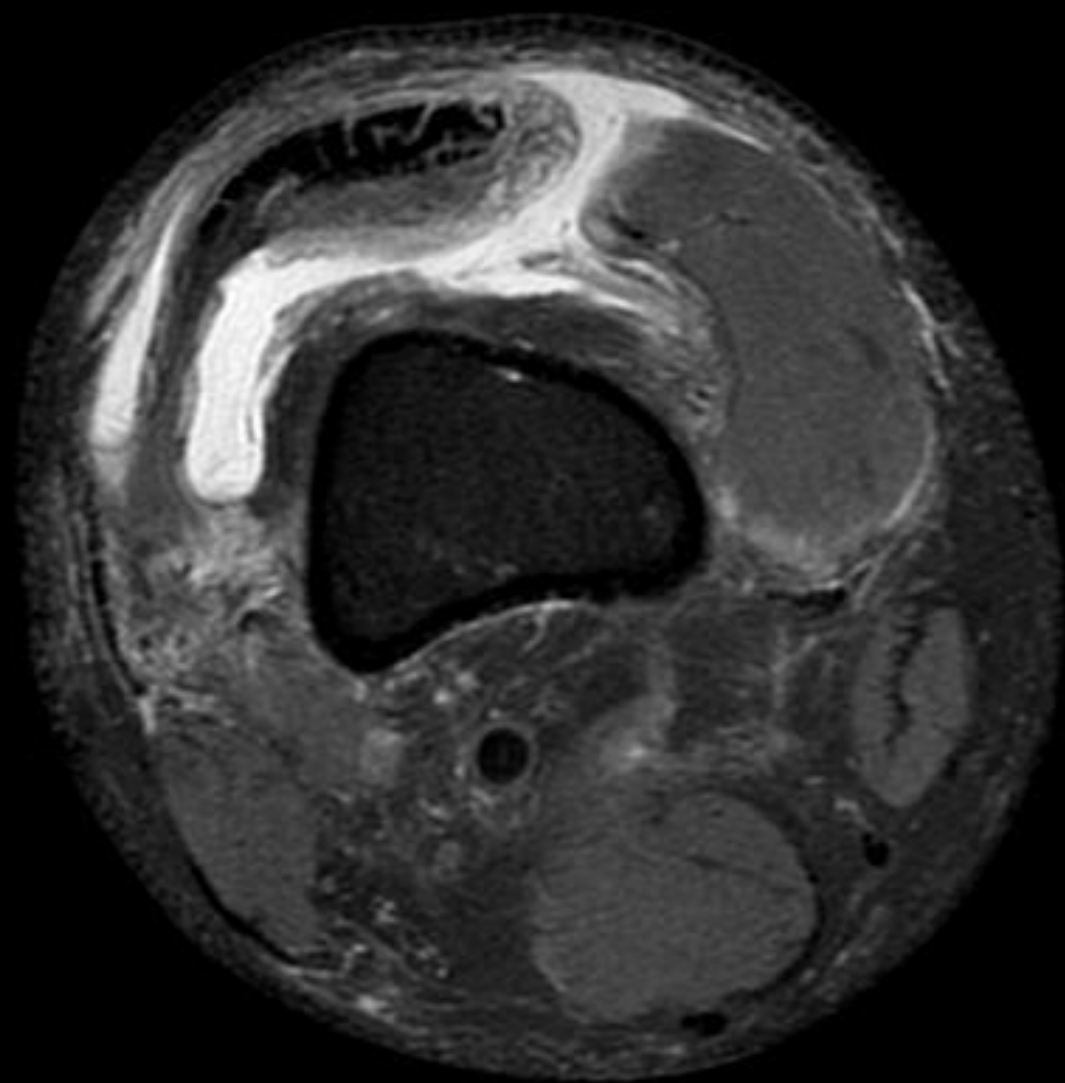


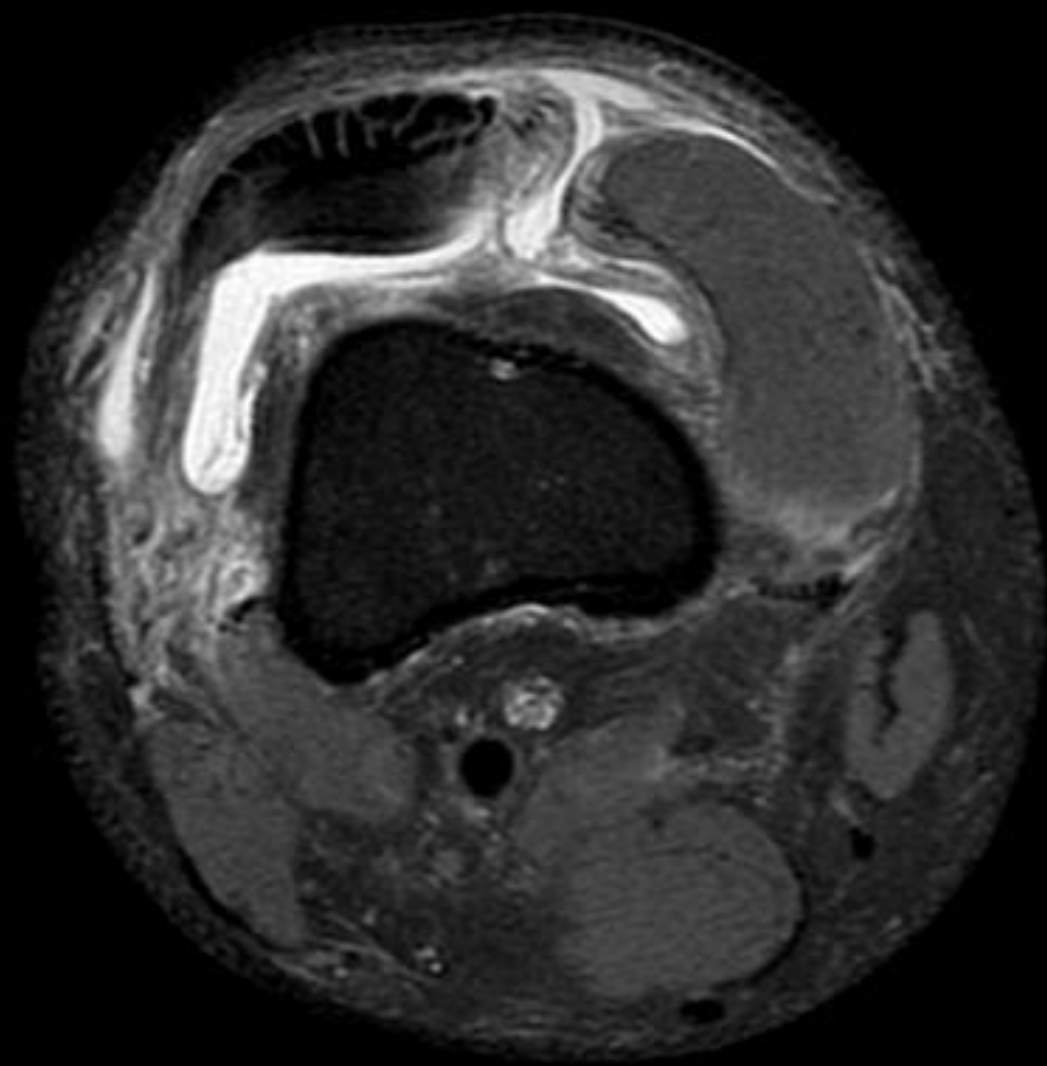


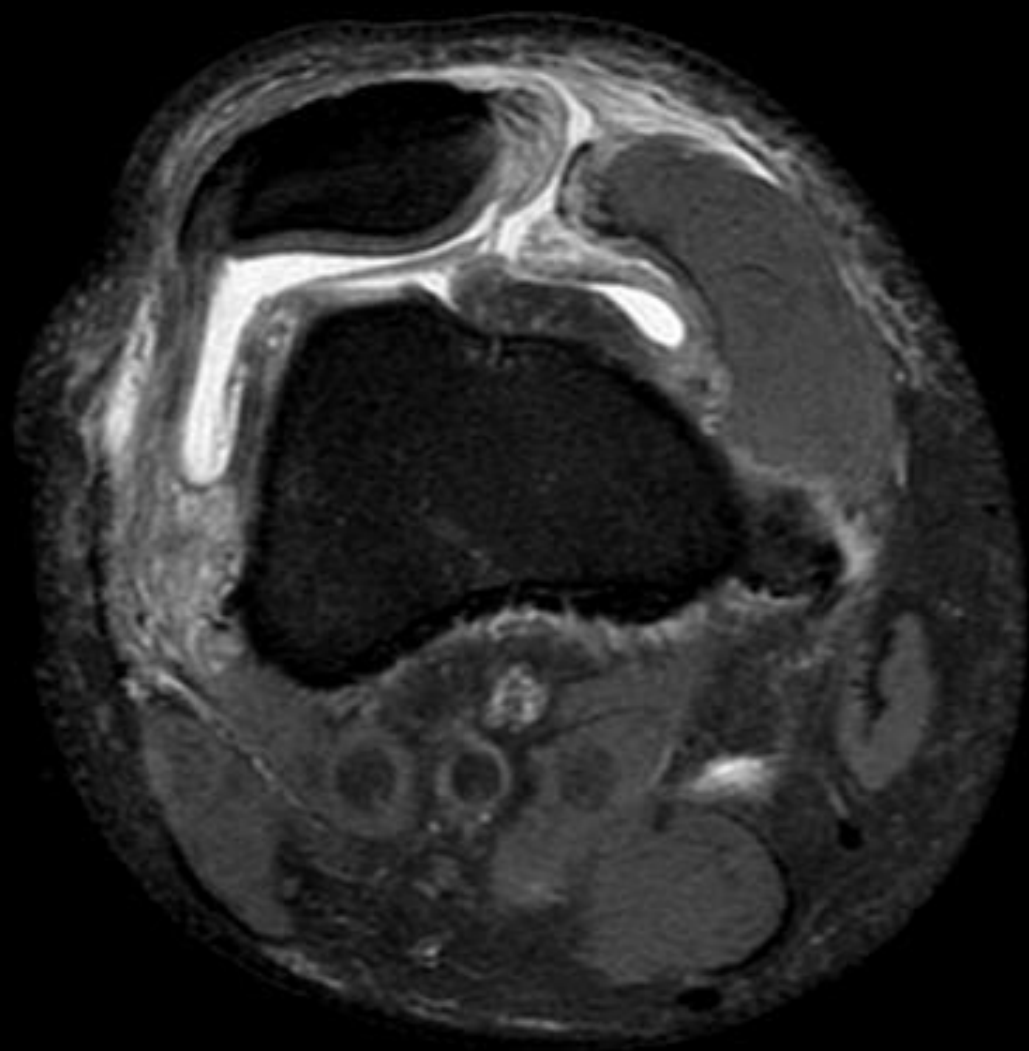






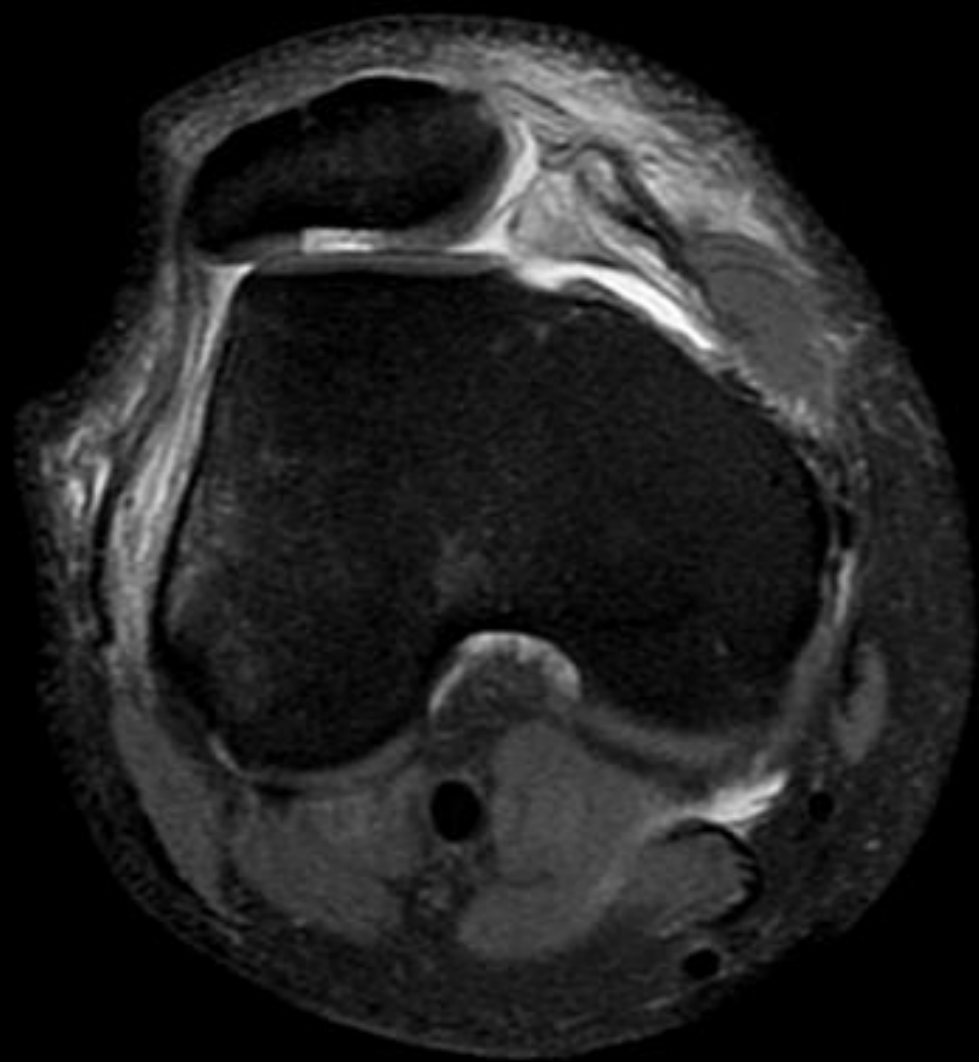


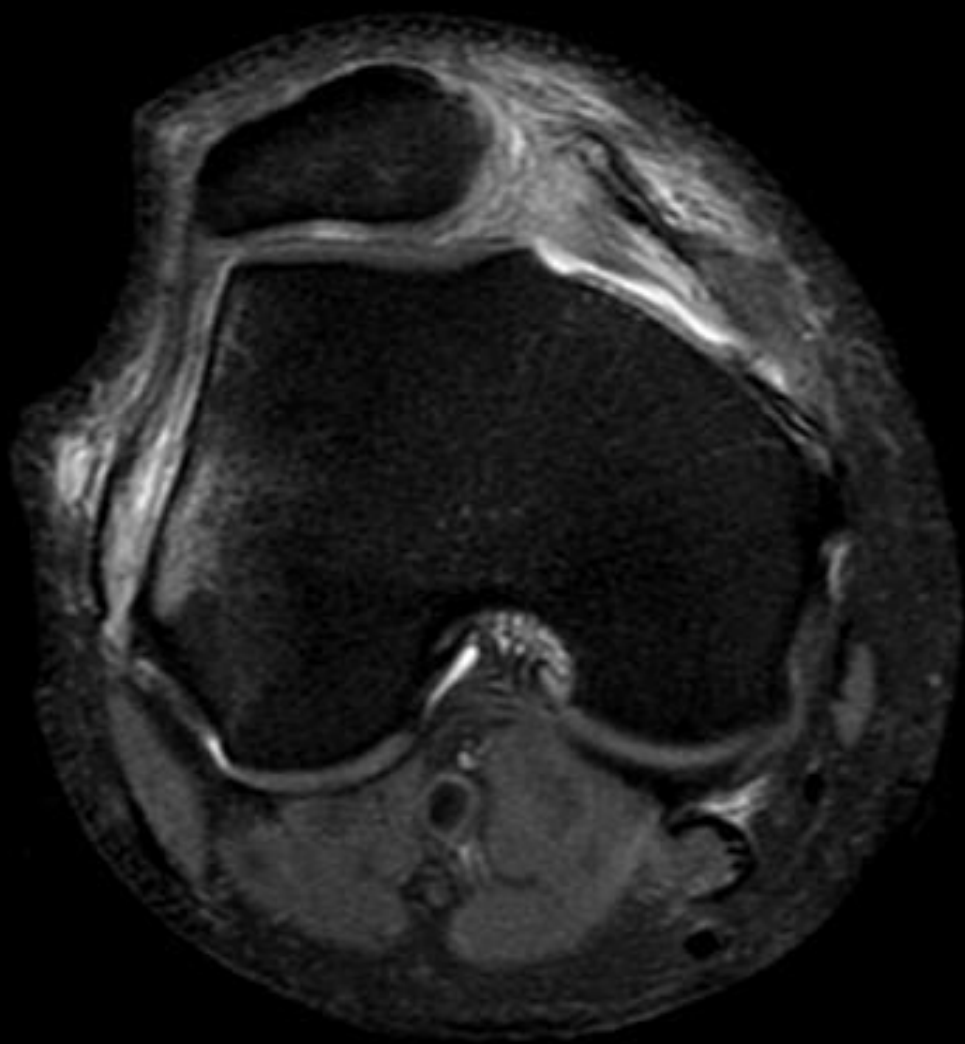


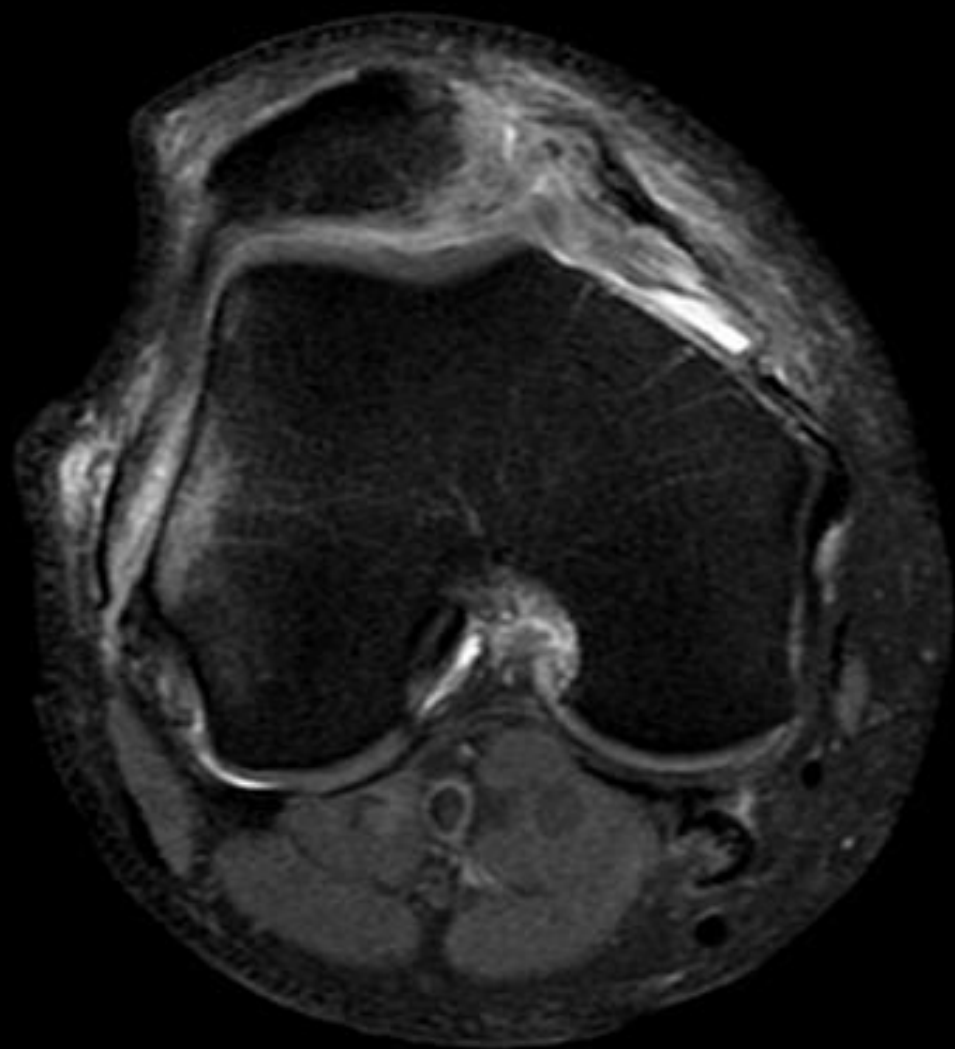


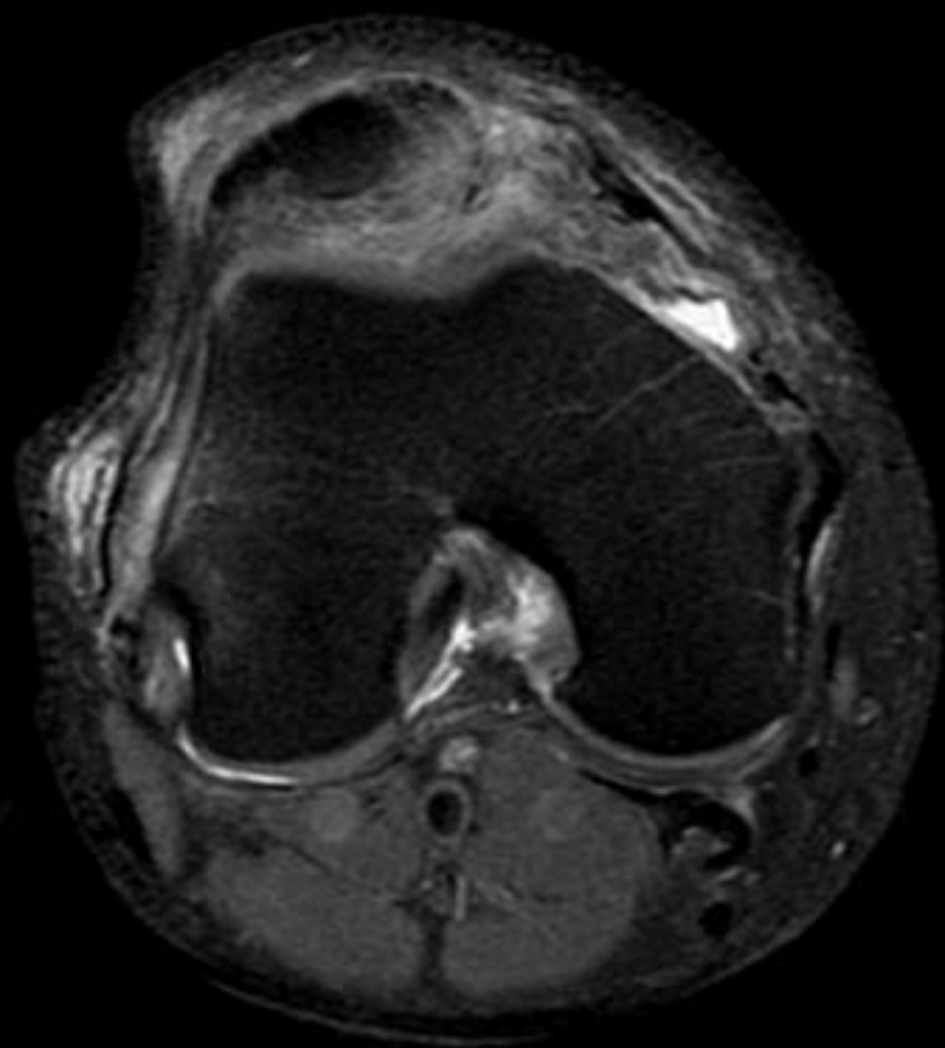


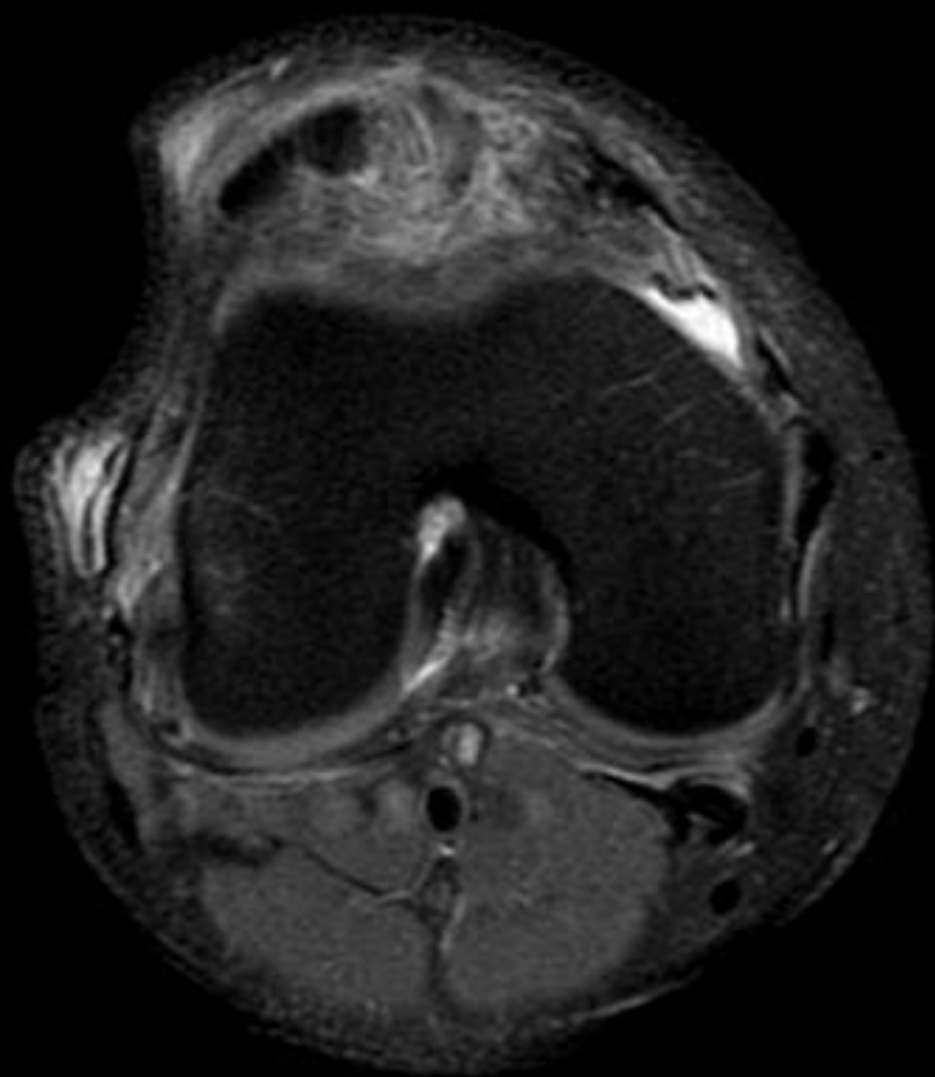


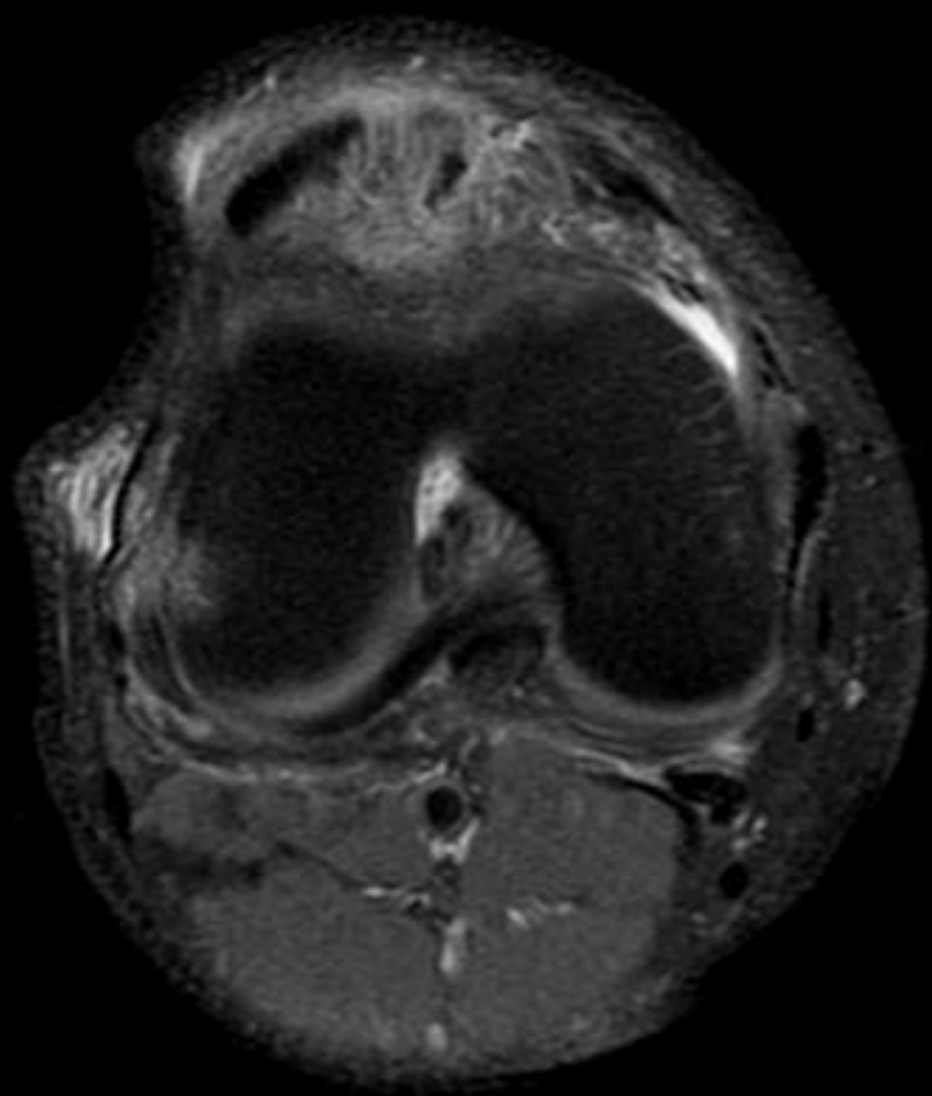


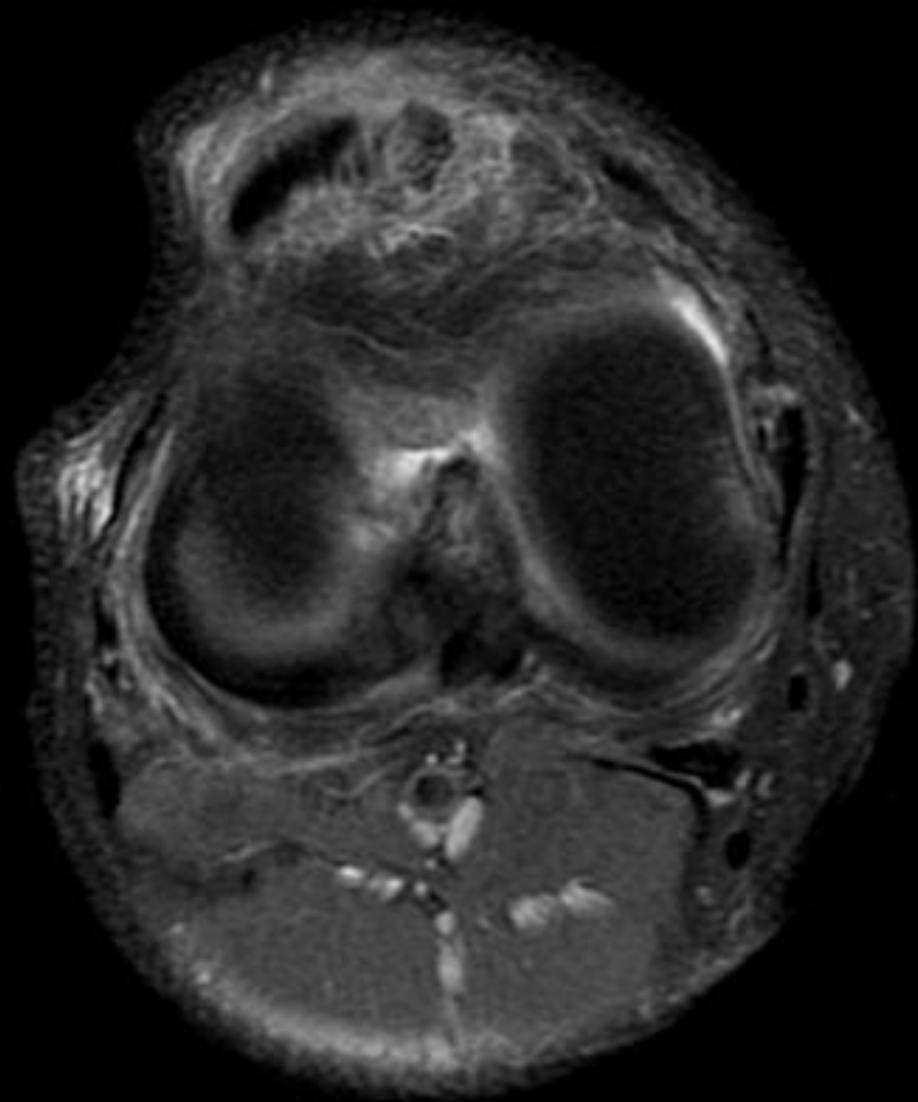


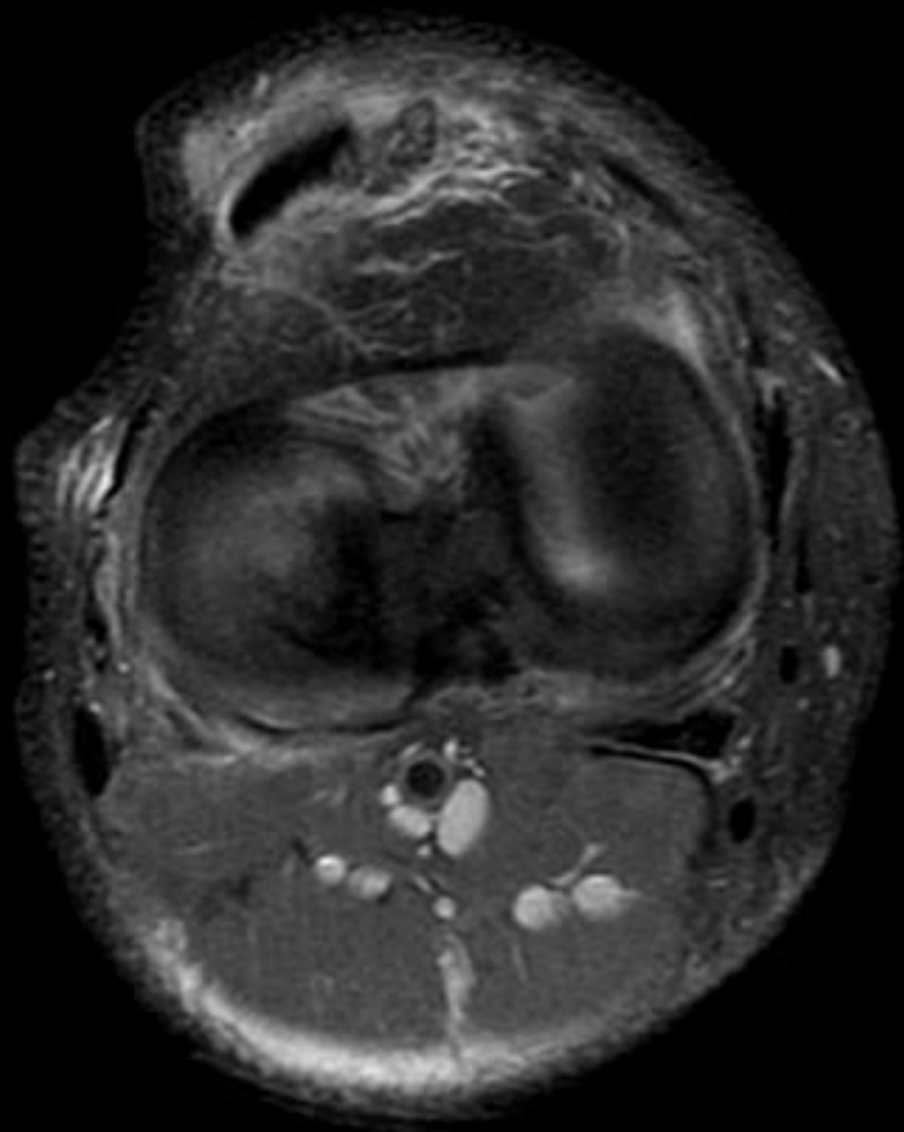


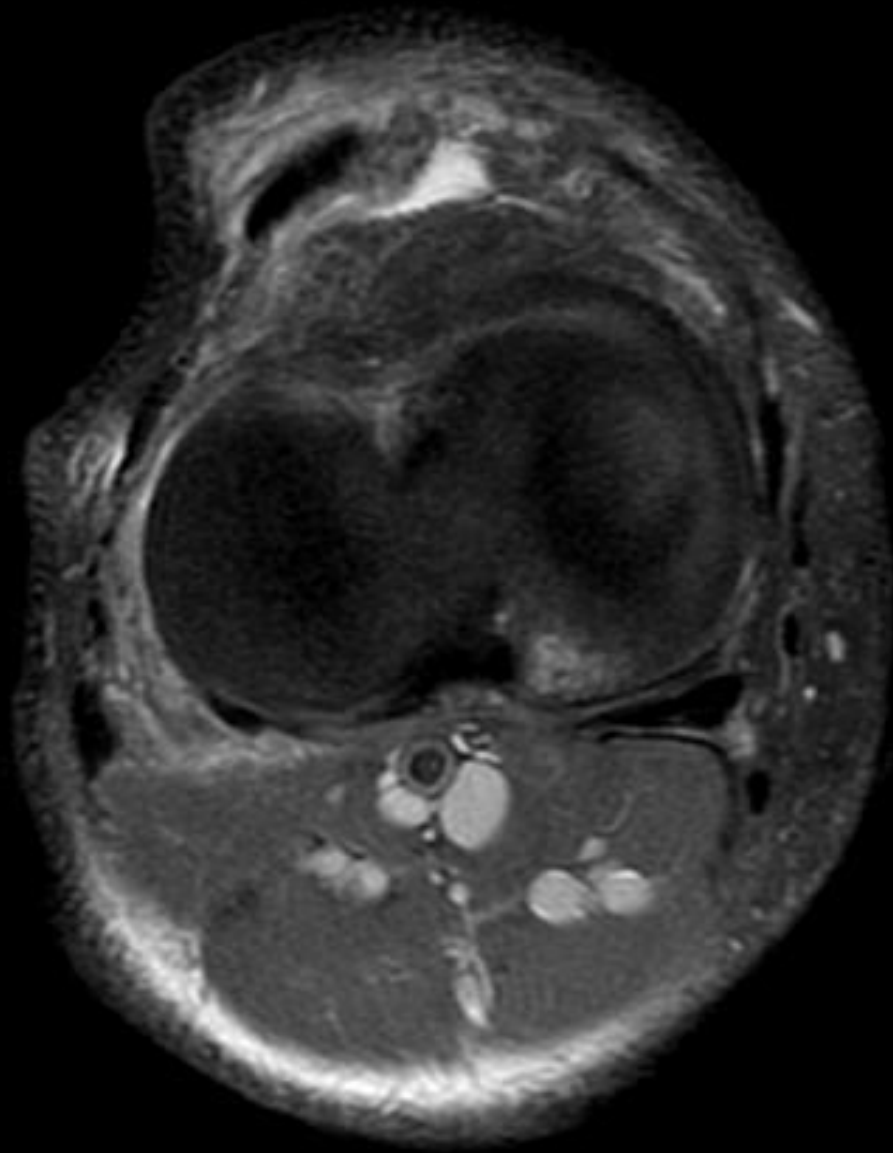




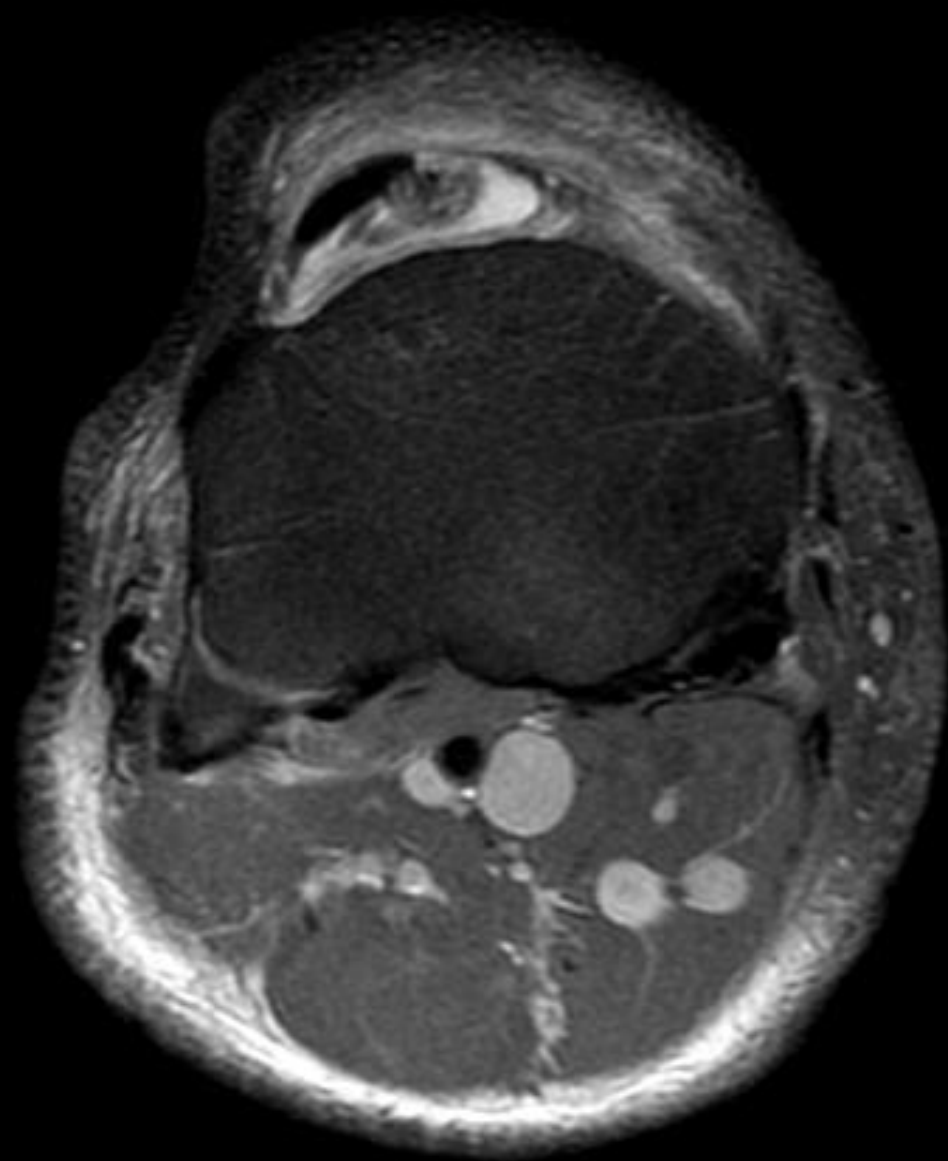


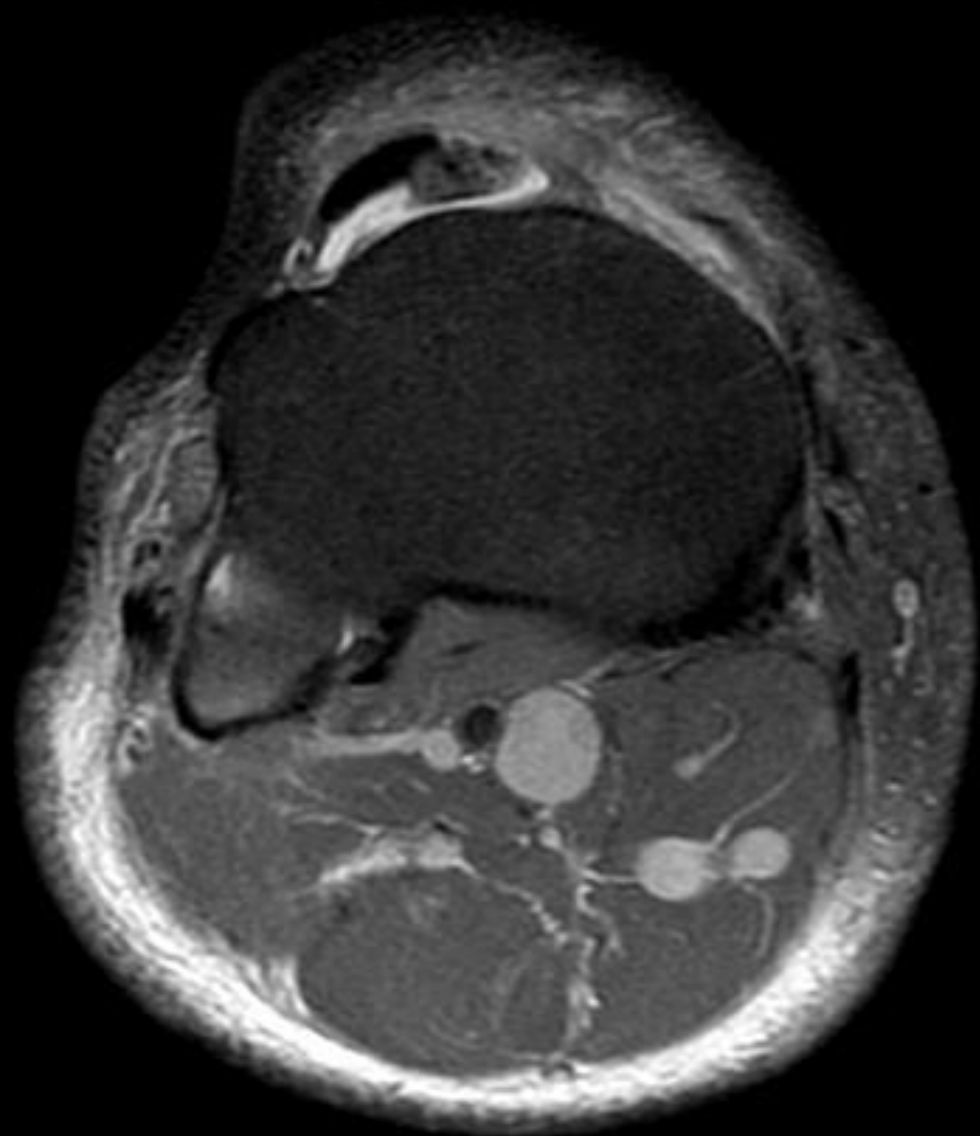


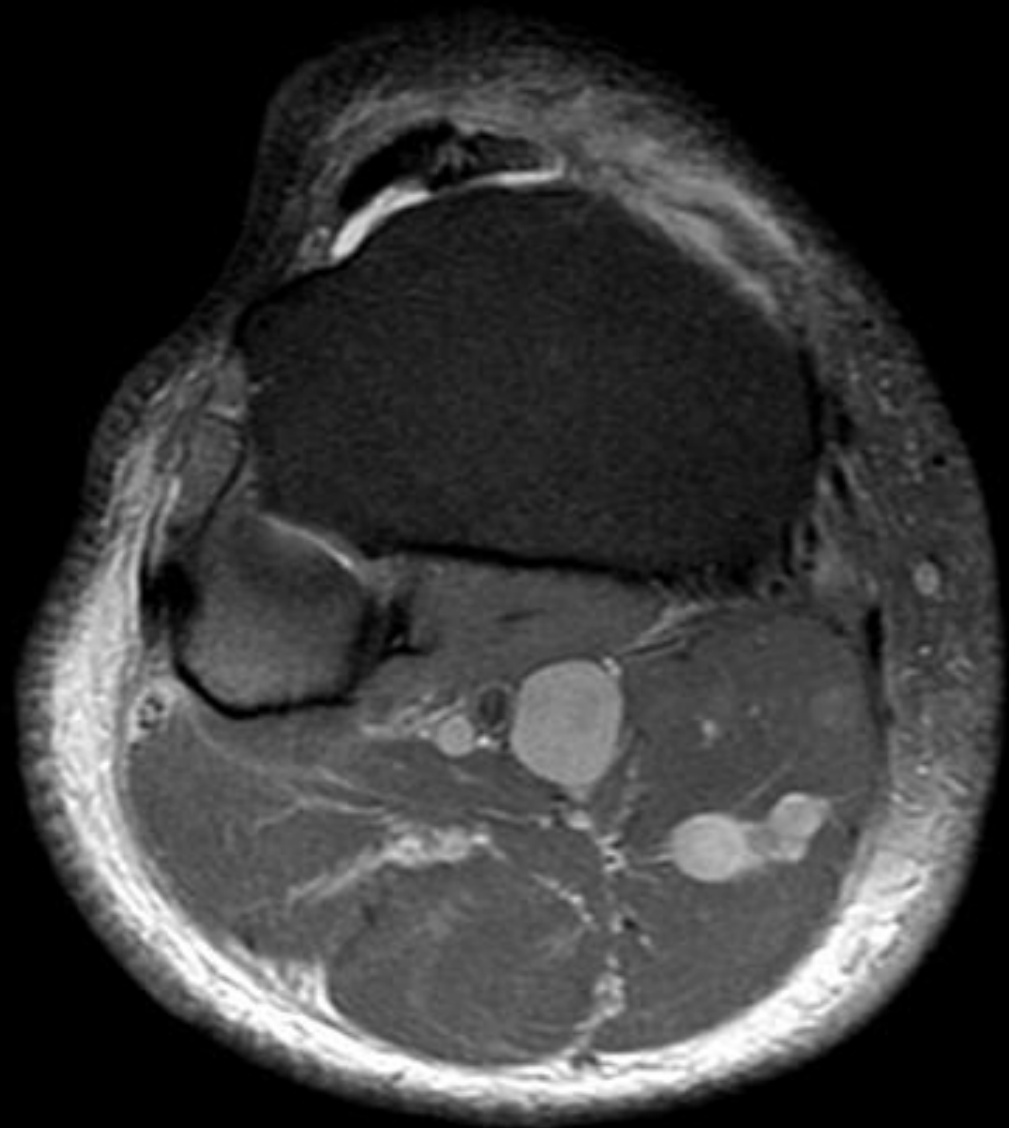


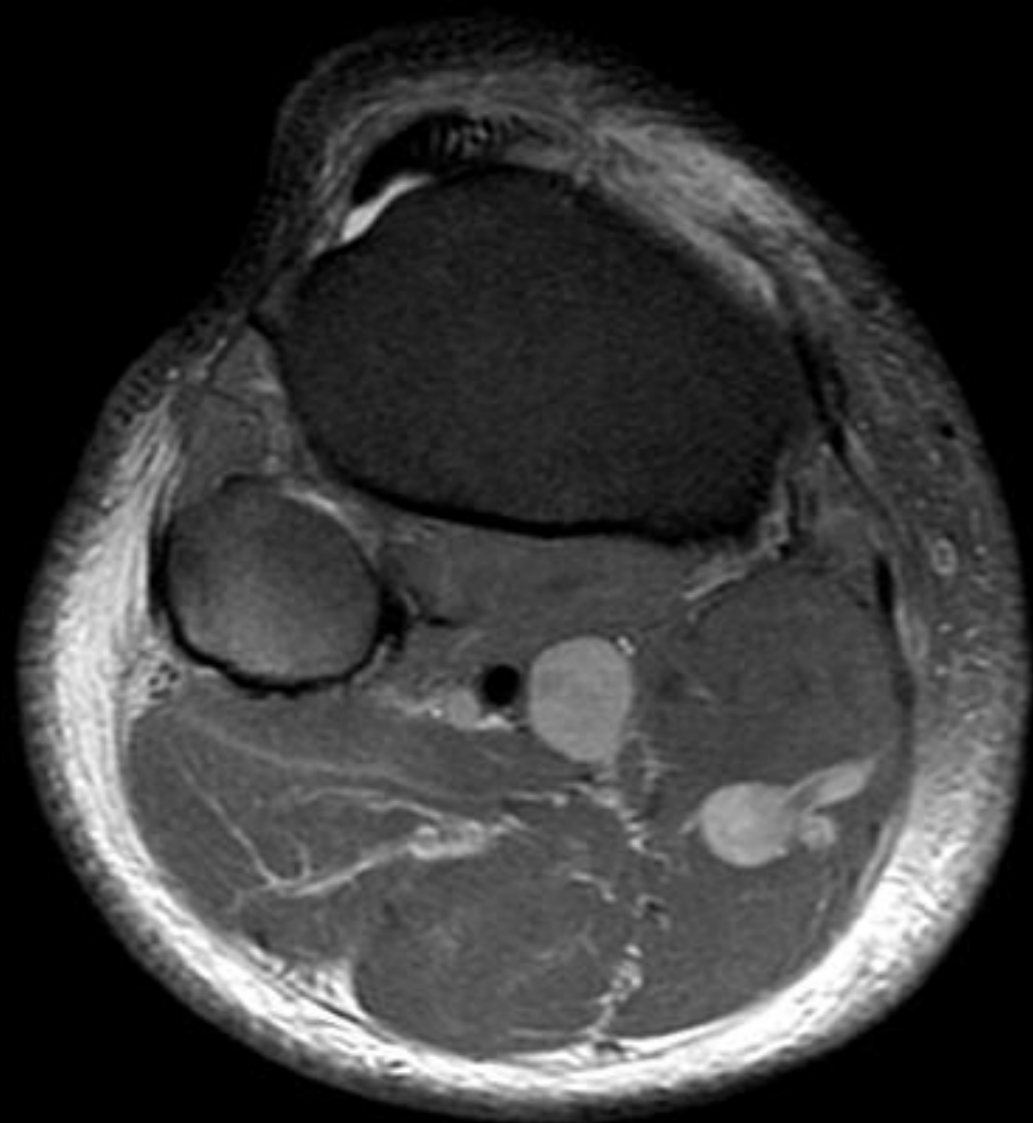














Lateral Patellar Dislocation with tears of VMO and Patellar Tendon

- Flexed knee with knee in internal rotation on a planted foot
- Usually occurs in first 30 degrees of flexion

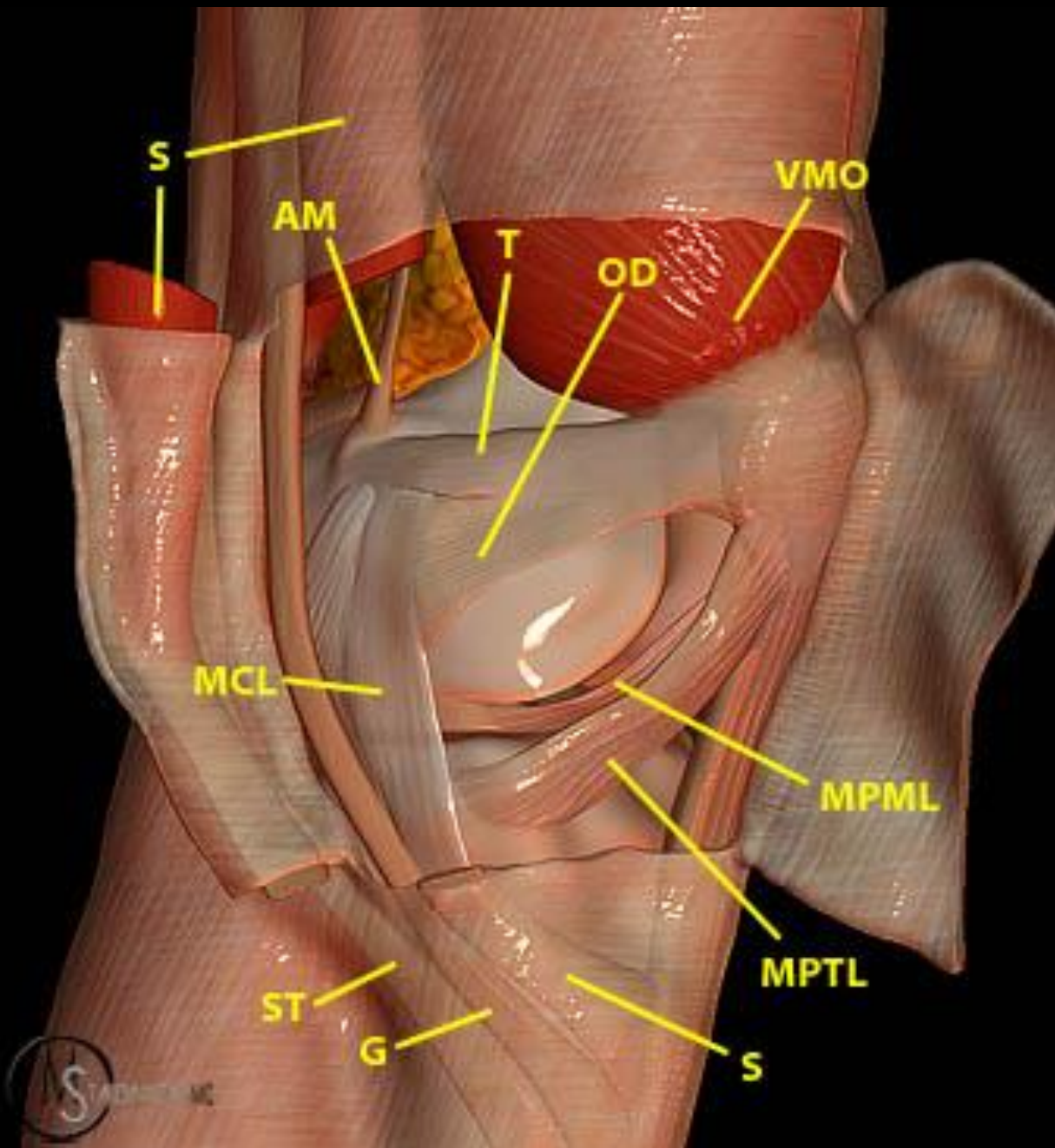


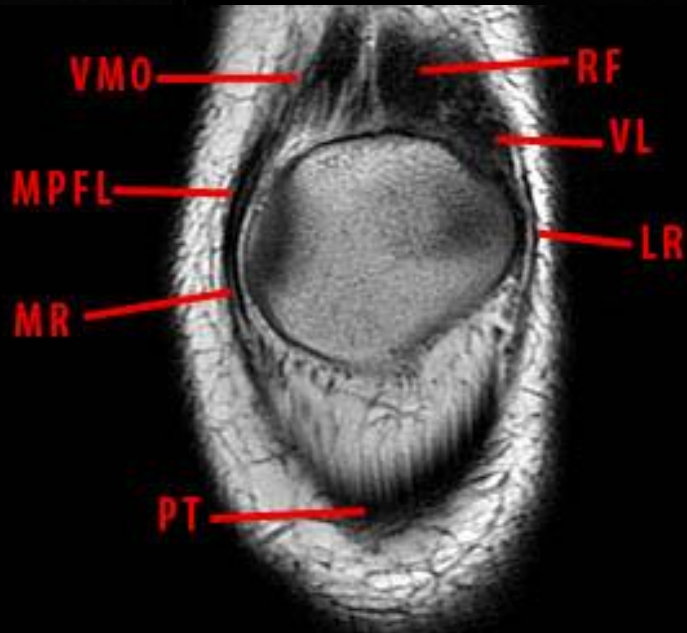
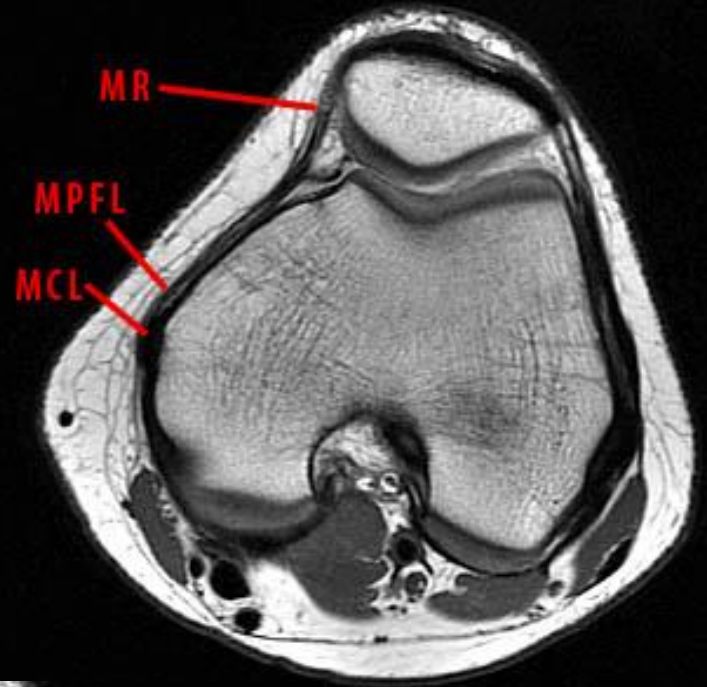
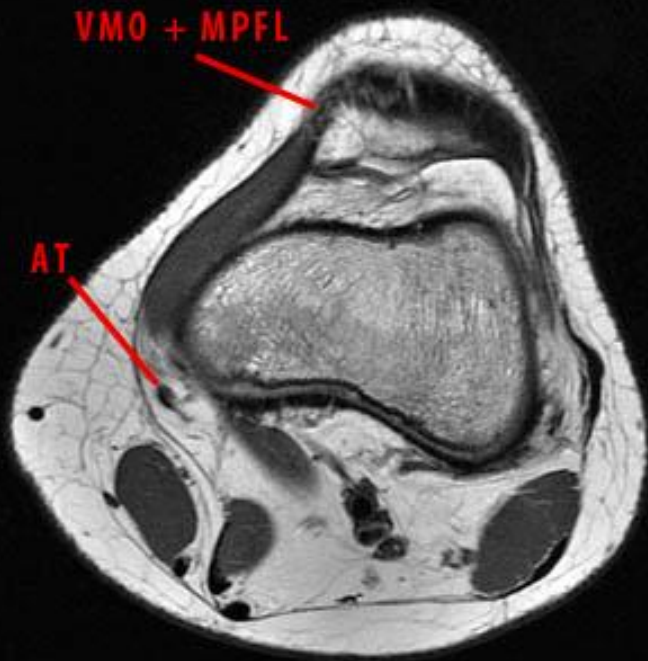
Relevant Anatomy

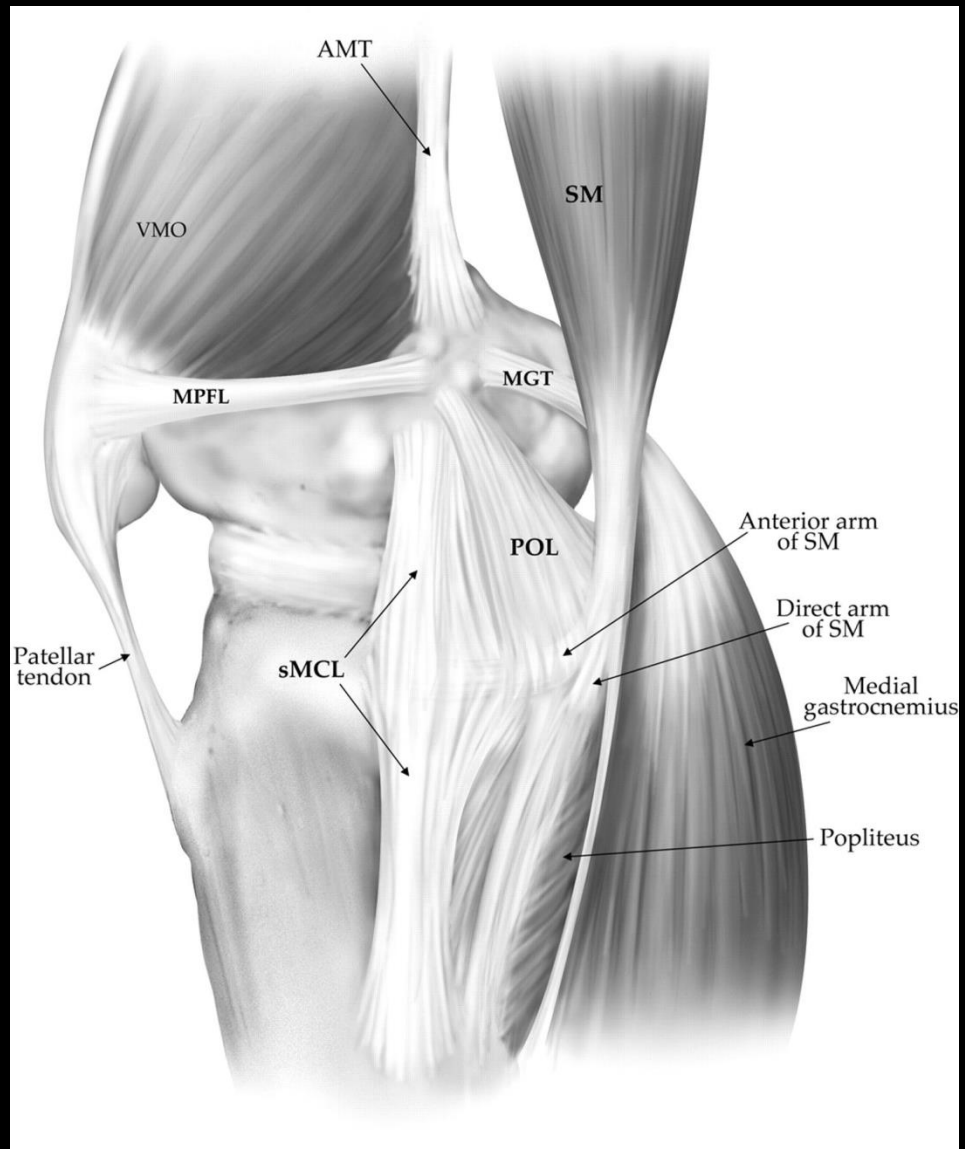
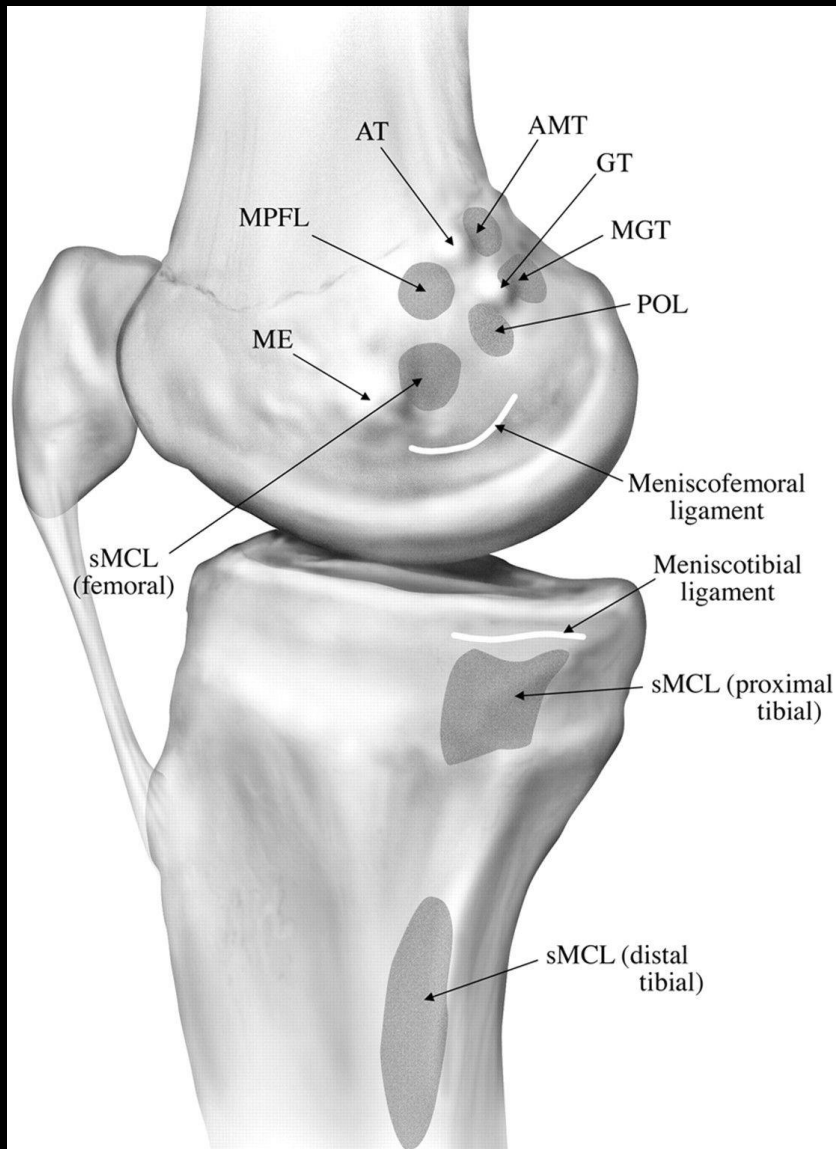
- Static stabilizers
 - Medial ligaments
 - Patellofemoral joint itself
- Dynamic stabilizers
 - Vastus medialis obliquus

Ligaments

- Medial patellofemoral ligament (MPFL)
 - Strongest restraint to lateral patellar translation
 - Two parts: transverse band and oblique decussation
 - Inserts **SUPERIORLY**
- Patellar retinaculum
 - Blending of fibers from oblique decussation of MPFL, superficial MCL, medial patellomeniscal ligament, and medial patellotibial ligament
 - (Technically includes the MPFL)
 - Inserts **INFERIORLY**







Factors leading to instability

- Patella alta
- Excessive lateral distance between trochlea and the tibial tuberosity
- Trochlear dysplasia

Patella Alta



- Patellar Height Ratio (Insall-Salvati Index)
- = Patellar Tendon length/Patellar height
- = A/B
- Normal: 0.8-1.2
- Alta: >1.3
- 1.0 in this case (normal)

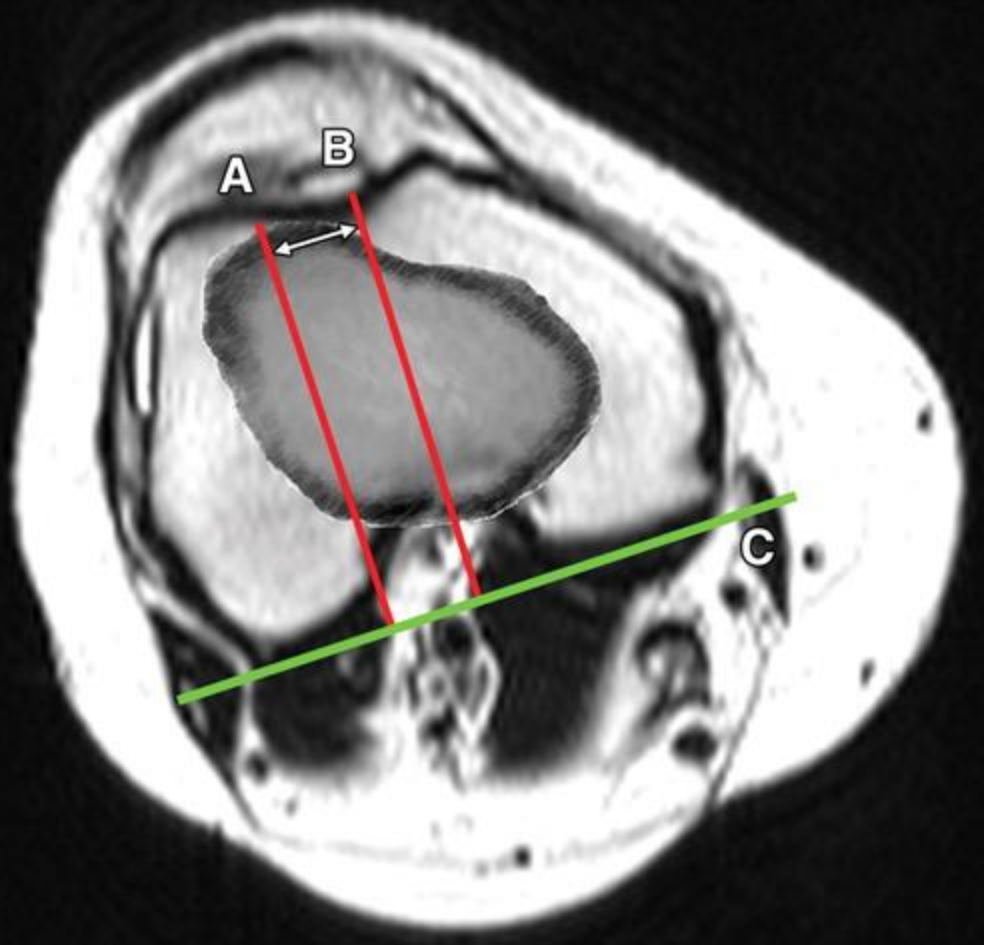
Patella Alta



- $A/B = 1.4$
- Patella Alta

- Other ways to measure:
 - Blackburne-Peel
 - Caton-Deschamps

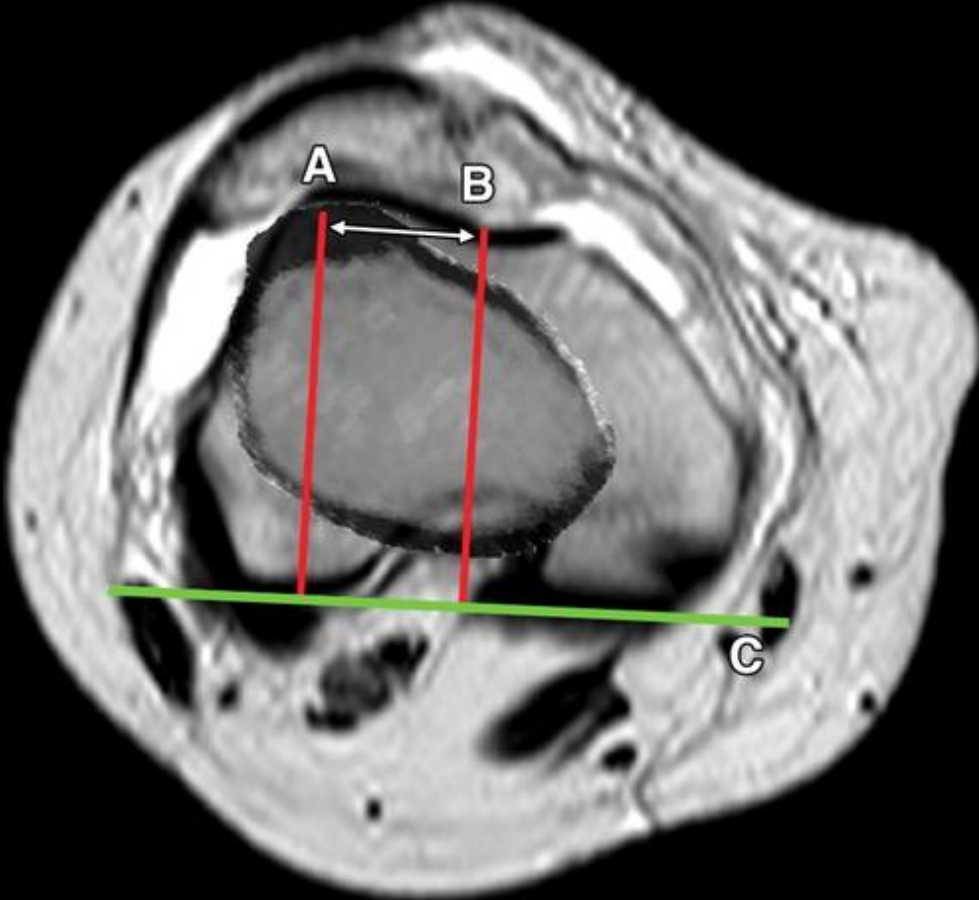
Increased trochlea-tibial tubercle distance



NORMAL (12mm)

- Increased from deepest part of trochlea to tibial tubercle
- Normal: <15mm
- Borderline: 15-22mm
- Elevated: >20mm

Increased trochlea-tibial tubercle distance



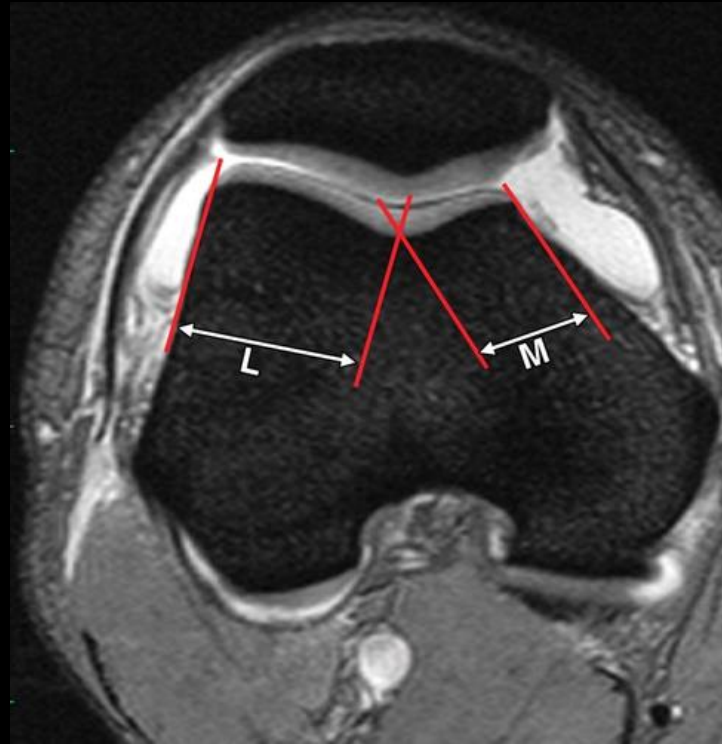
ELEVATED (22mm)

Trochlea Dysplasia

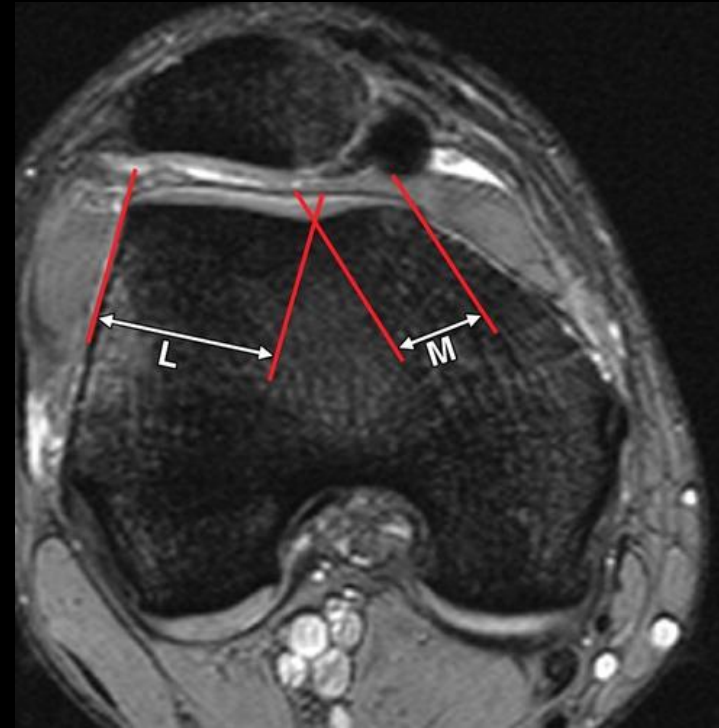
- Flattening of the trochlea proximally
- Concavity less pronounced distally
- Measures on MRI:
 - Facet asymmetry
 - Trochlear Depth
 - Trochlear inclination

Trochlear Facet Asymmetry

- Measured 3 cm above joint
- Ratio of medial trochlear facet to lateral facet
- $<40\%$ = dysplasia



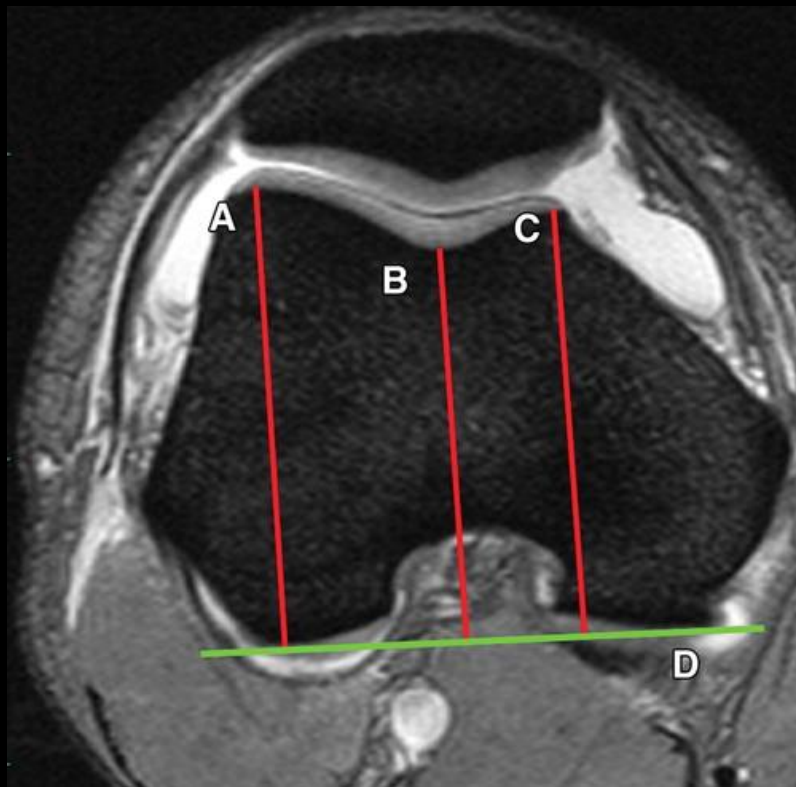
NORMAL (68%)



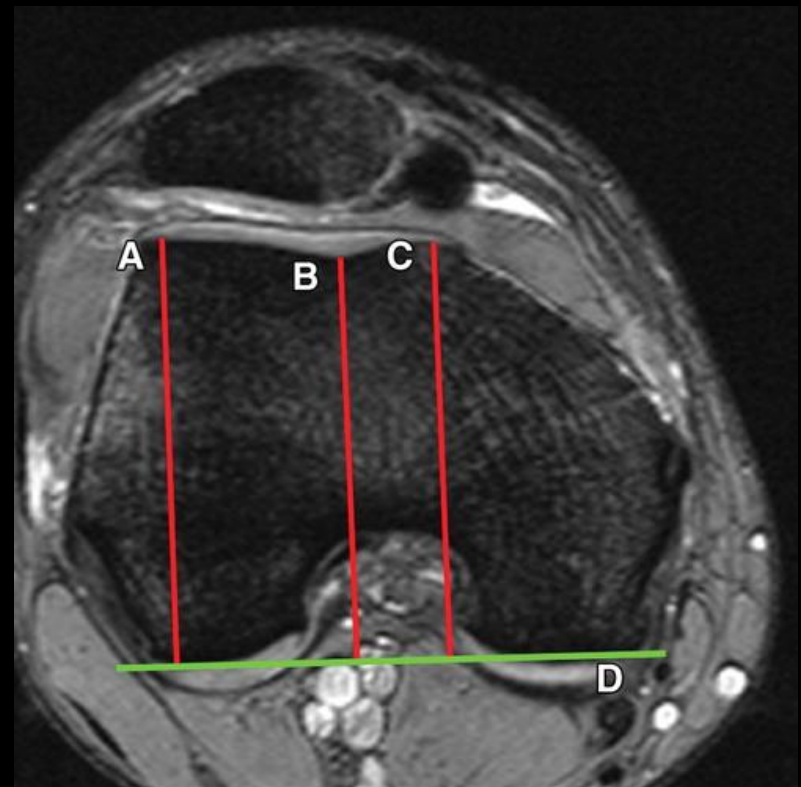
DYSPLASTIC (38%)

Trochlear Depth

- Measure depth of trochlea 3 cm above joint
 - Relative to posterior aspects of condyles, or...
 $(A+C)/2 - B$



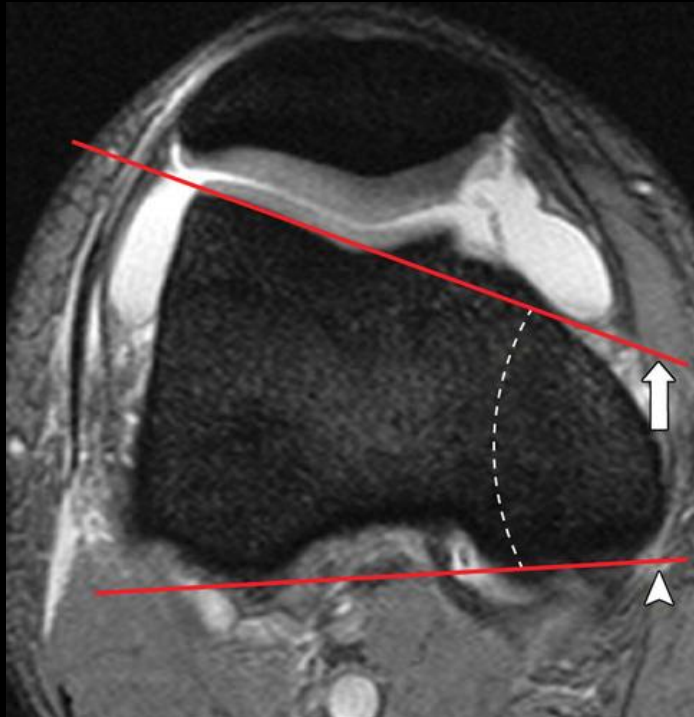
NORMAL (12mm)



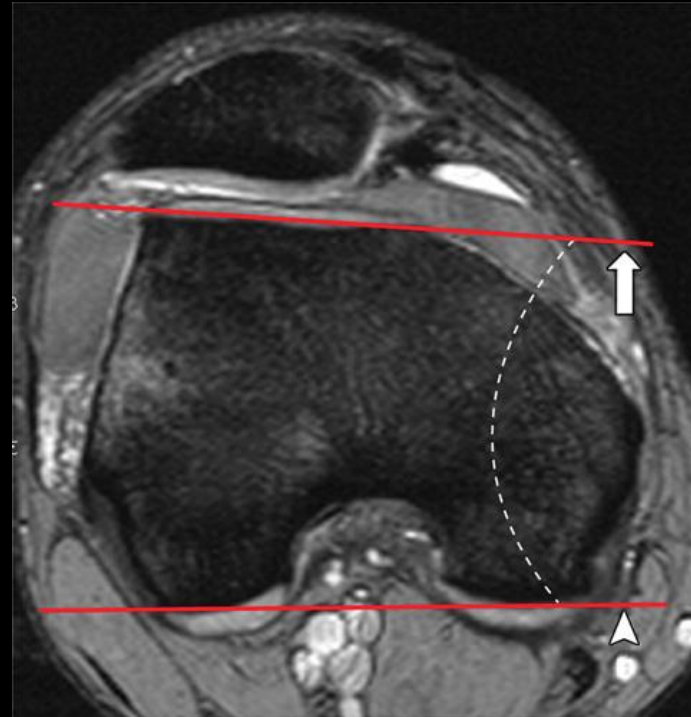
DYSPLASTIC (1.5mm)

Trochlear Inclination

- Measure at most superior section showing cartilage on axial set
- Angle between lateral trochlear facet and tangential line connecting posterior femoral condyles
- $<11^\circ \rightarrow$ dysplastic (sens 93%, spec 87%)



NORMAL (24°)



DYSPLASTIC (7°)

Treatment

- MPFL reconstruction
- Medial capsular plication
- Lateral capsular release
- Trochleoplasty
- Tibial tuberosity transfer

References

1. Diederichs, G, Issever, A, Scheffler, S. MR Imaging of Patellar Instability: Injury Patterns and Assessment of Risk Factors. Radiographics 2010; 30:961-981.
2. LaPrade, R, Engebretsen, AH, Ly, T, Johansen, S, Wentorf, A, Engebretsen, L. The Anatomy of the Medial Part of the Knee. J Bone Joint Surg AM, 2007 Sep; 89 (9): 2000-2010.
3. MRI Web Clinic: Transient Lateral Patellar Dislocation. <http://radsource.us/transient-patellar-dislocation>. 2013 Apr.