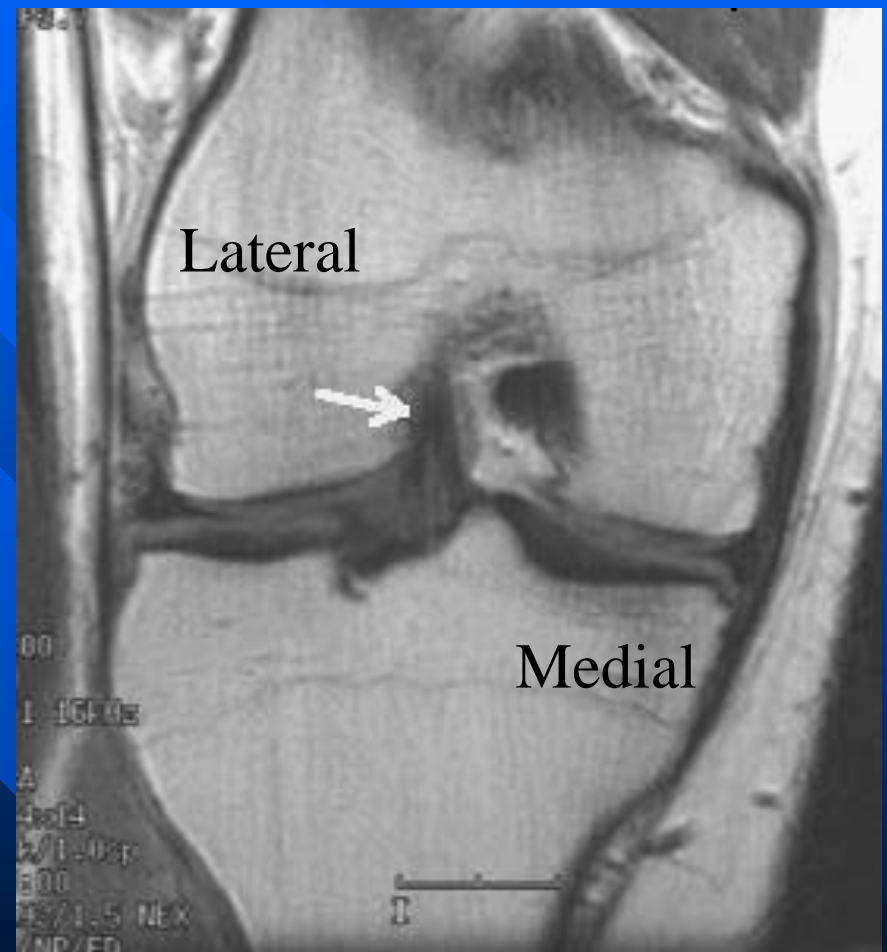


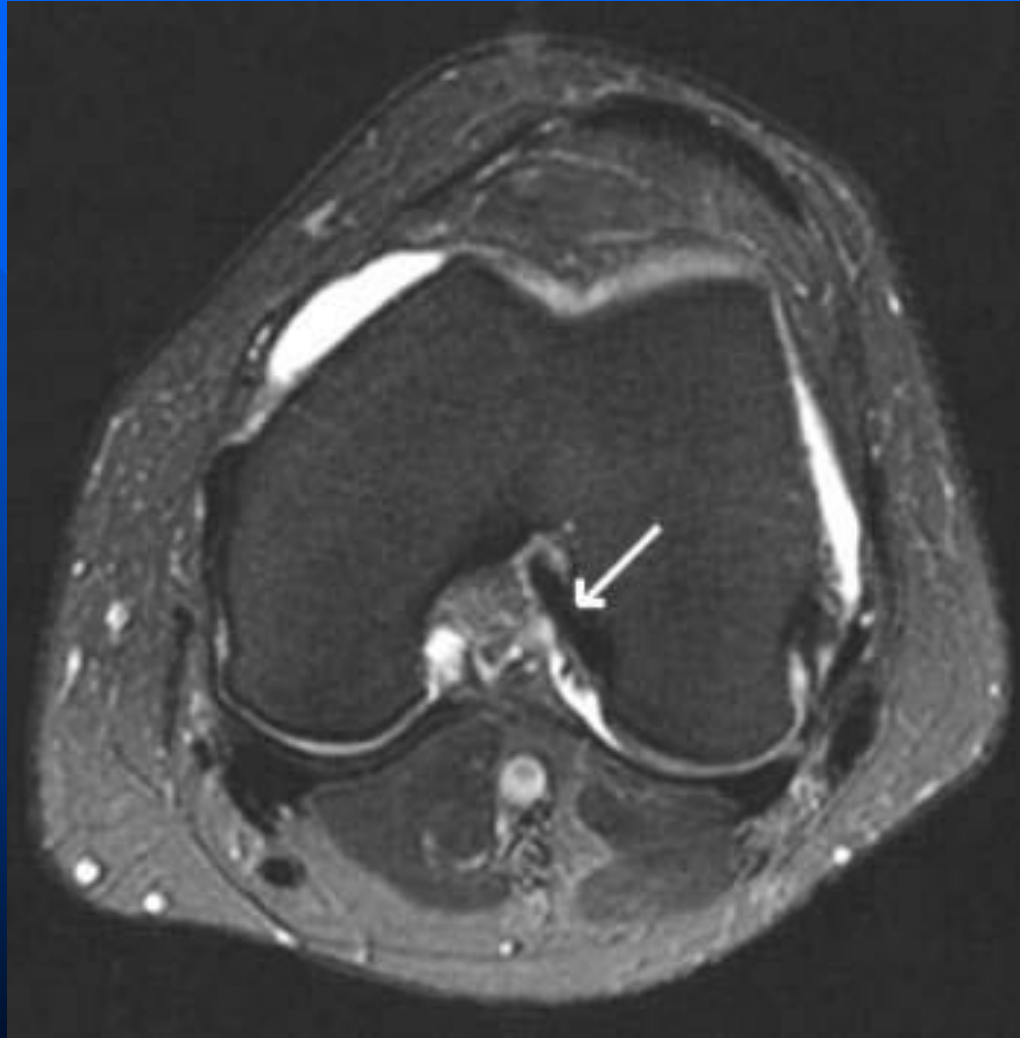
ACL

- Multiple separate fascicles, which spiral laterally from femur to tibia (fibers rotate externally 90°); fatty tissue is seen between fibers
 - Continuum of fibers allows variable tension, with some taut throughout knee range of motion
 - Anteromedial bundle: Tight in flexion, lax in extension
 - Posterolateral bundle: Tight in extension, lax in flexion
- **Extrasynovial but intracapsular** location
- **Function**
 - Primary restraint to anterior tibial translation
 - Major secondary restraint to internal rotation; minor secondary restraint to external rotation
 - Minor secondary restraint to varus/valgus at full extension

Normal ACL



Normal ACL in Axial Plane

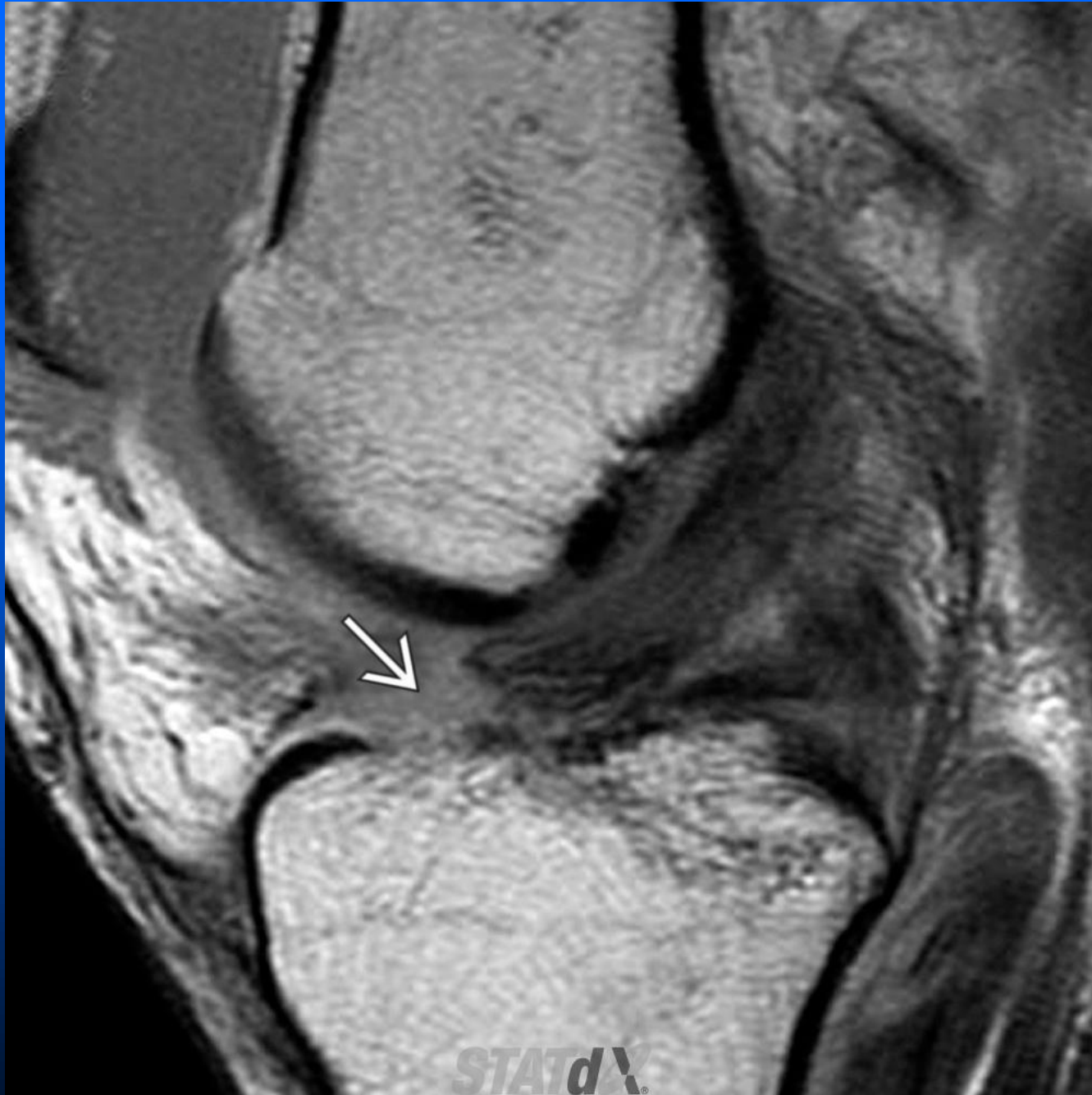


Tear

- Most tears occur in proximal or mid portion of ligament.
- Conservative treatment for low-grade partial ACL tear
- Tears involving $< 25\%$ cross section of ligament have favorable prognosis
- Surgical repair success rate: 75-95%



Coronal T2WI FS MR from the same patient shows mild fiber delamination and edema (white solid arrow) in the mid and distal portions of the ACL. The normal unwinding of the bundles in the distal ACL should not be edematous.

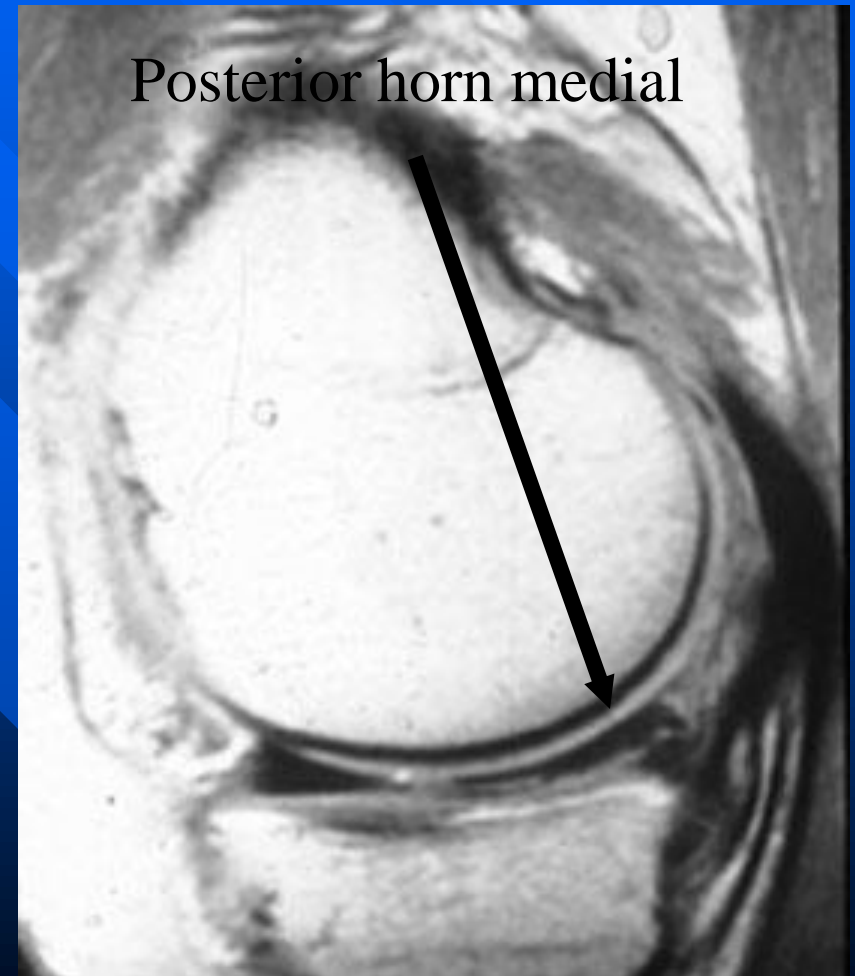


Sagittal PDWI MR shows an unusual tear of the distal substance of the ACL (white solid arrow). Tears of the ACL usually involve the proximal or mid portion of the ligament, or they may result in osseous avulsion of the tibial attachment.



Coronal T2WI FS MR in the same patient better shows the horizontal morphology of the tear (white solid arrow). A small fragment arising from the undersurface of the meniscus is displaced into the inferior medial gutter (white curved arrow).

Terrible triad



Terrible triad



Terrible triad

- Actually, there are often four components on MR as in this case:
- ACL tear, posterior horn medial meniscus tear, MCL tear and contusion of the lateral aspects of the tibial plateau and distal femur.
- These contusions are the result of the valgus force delivered to the knee causing compression laterally and distraction medially, the latter leading to the MCL injury

ACL tear with "kissing contusions"

