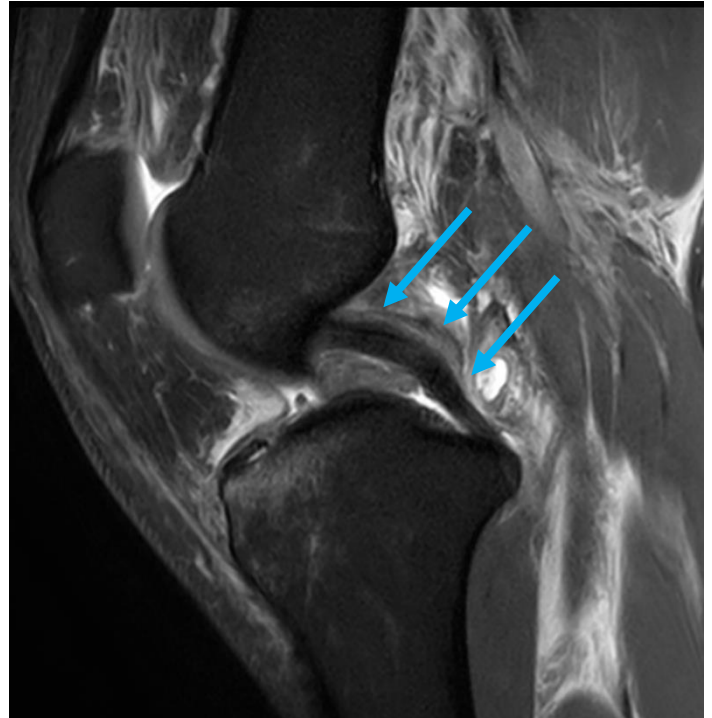
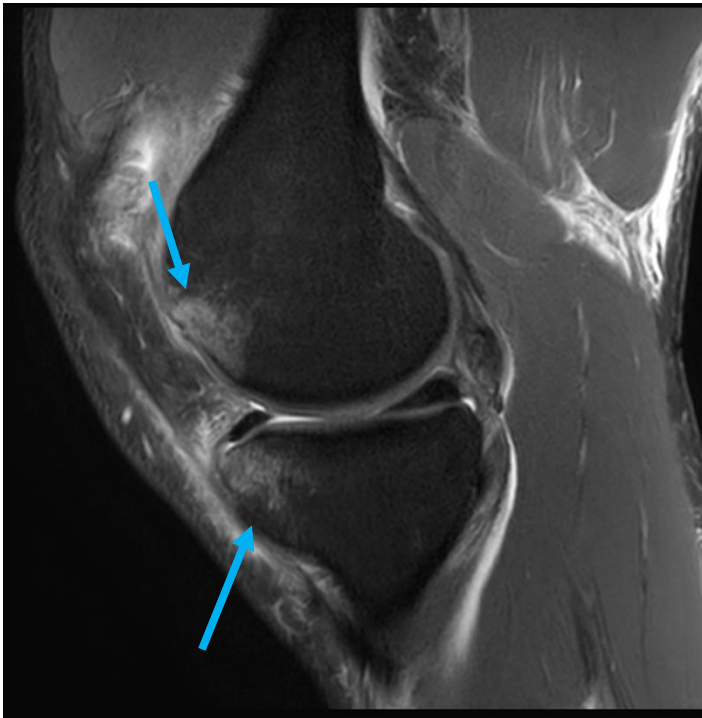


27 M footballer, sustains a hyper-extension injury during AFL - ? PCL tear

MRI Findings:

- Bone marrow contusions of the anterior tibial plateau and femoral condyles
- BUT, the PCL shows evidence of low grade injury and is intact
- Instead, there is:
 - High grade tearing of the semimembranosus tendon, which is retracted proximally
 - Partial tearing of the biceps femoris tendon
 - Associated collateral ligament injuries (not shown)
 - In this patient, the hamstring tendons tore before the PCL did!

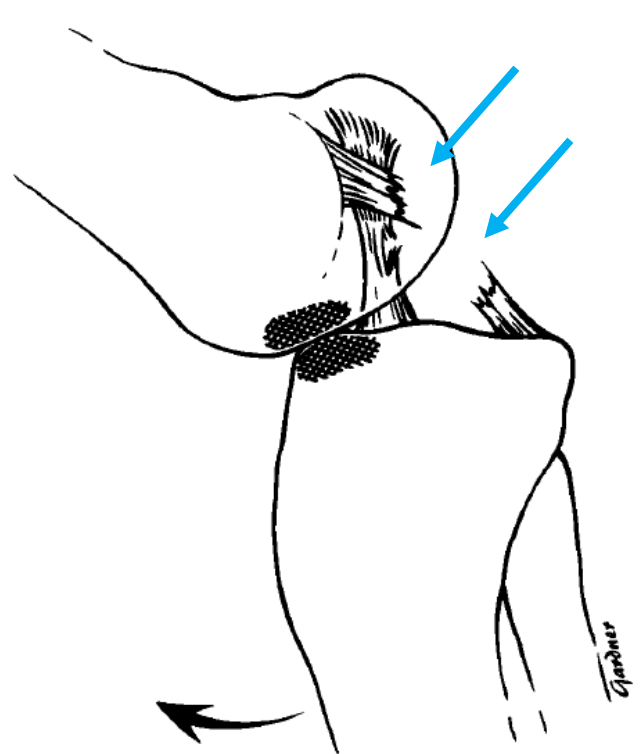
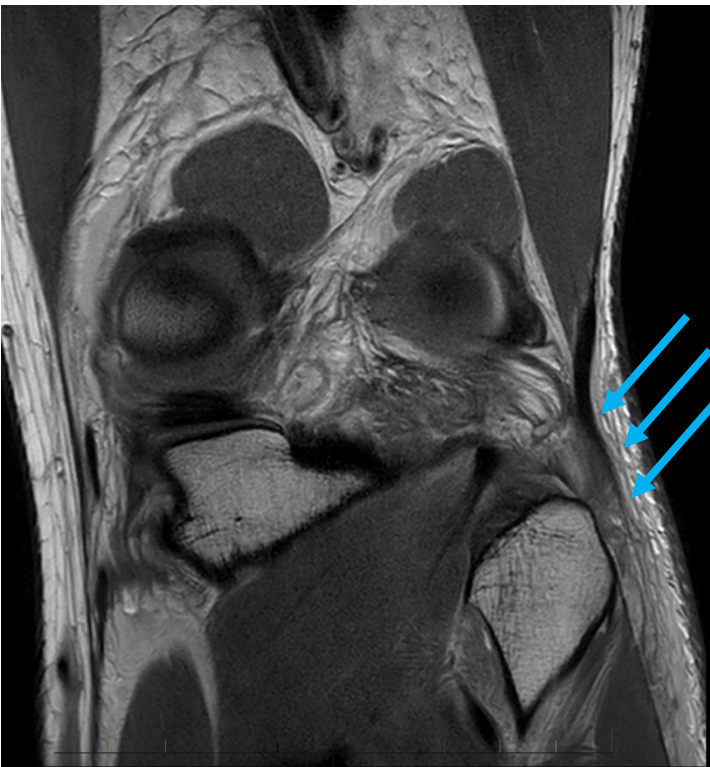
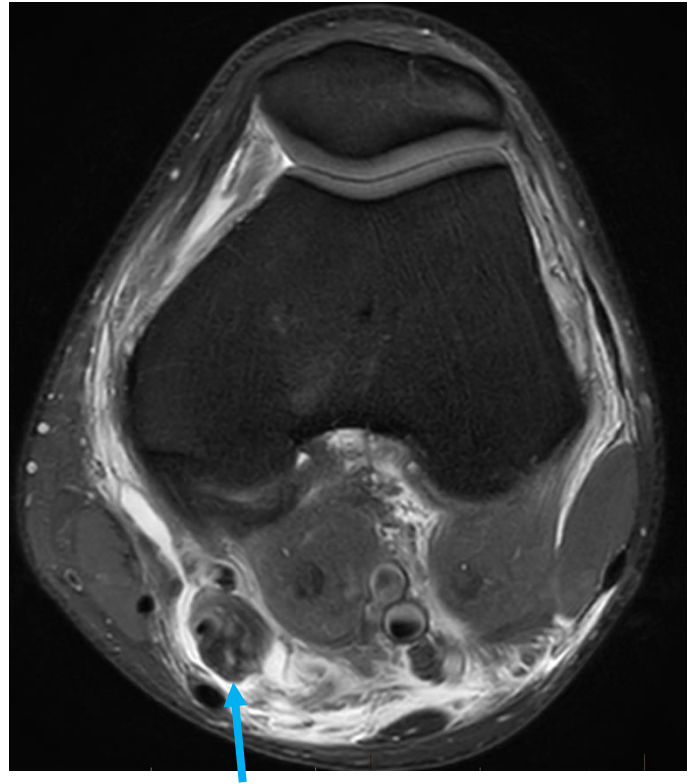
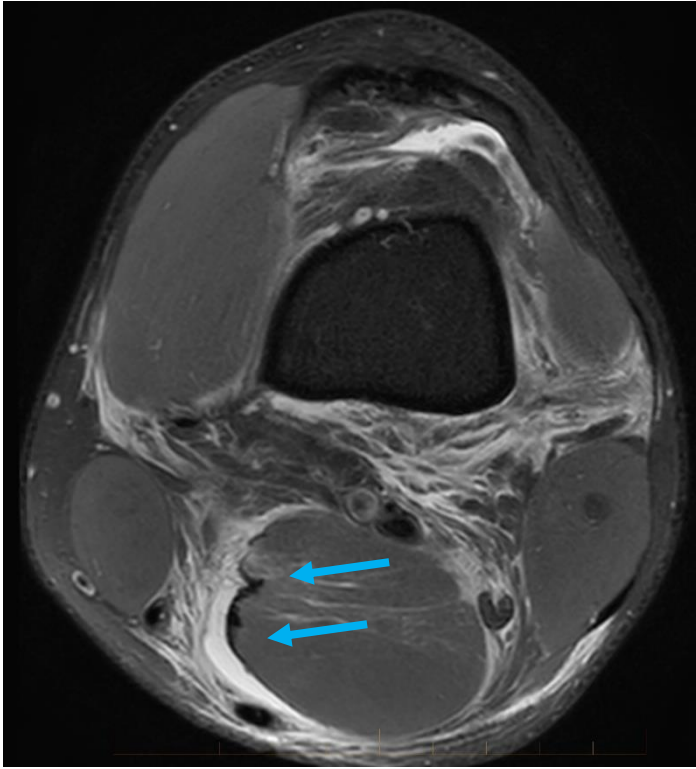


TOP LEFT: Sagittal T2 weighted imaging shows knee hyper-extension type bone marrow contusions of the anterior aspects of both the tibial plateau and femoral condyle.

TOP RIGHT: When images of the intercondylar notch are reviewed, however, the PCL in our patient is intact! (However, note the per ligamentous oedema, however, suggesting low grade injury- this patient's PCL didn't escape completely unscathed!).

BOTTOM LEFT: However, when the more sagittal slices are interrogated, we can see that the semimembranosus tendon is completely torn, retracted, and folded back on itself. This is a case of a distal semimembranosus tendon tear.

Other images, overleaf, show the biceps femoris injuries in an axial plane, as well as the co-existent biceps femoris tendon tearing...



TOP LEFT and **TOP RIGHT**: Axial T2 weighted imaging shows the injury to the biceps femoris – the top left image shows the distal musculotendinous junction and the surrounding oedema and blood/fluid products. A slightly more inferior slice, shown on the top right, is an axial image through the retracted semimembranosus tendon stump. The **BOTTOM LEFT** coronal PD is the best representation of the significant partial tearing through the biceps femoris tendon insertion to the fibula.

The **BOTTOM RIGHT** diagram has been taken from an excellent article by Sanders et al, which gives an overview of the expected injuries of a knee hyperextension type injury – the shaded areas represent the classic bone marrow contusions of hyperextension. As the illustration from Sanders et al aptly shows, a PCL rupture is the normal ‘expected’ finding in these type cases. That the tendons of both the medial and lateral hamstrings would rupture before the PCL is very unusual!

Further Reading:

Sanders et al, *Bone contusion patterns of the knee at MR imaging: footprint of the mechanism of injury*, Radiographics, 20:s 135-151, 2000