

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!

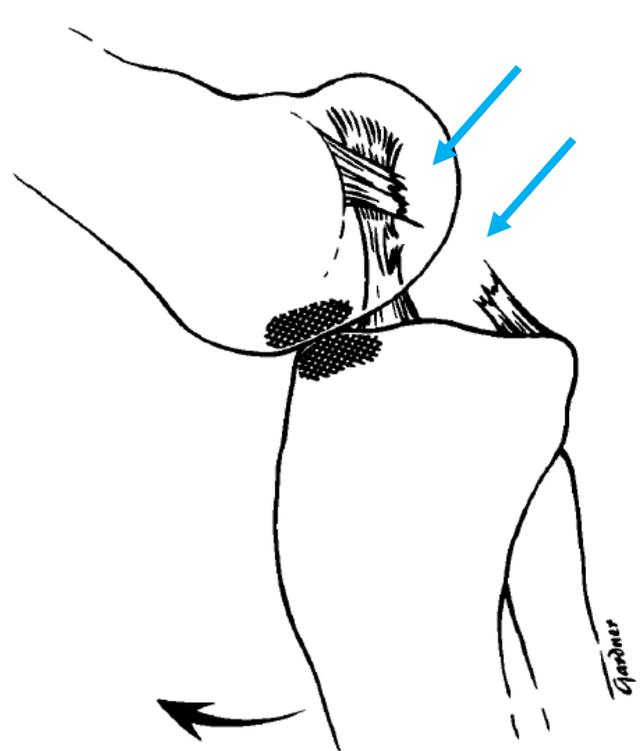
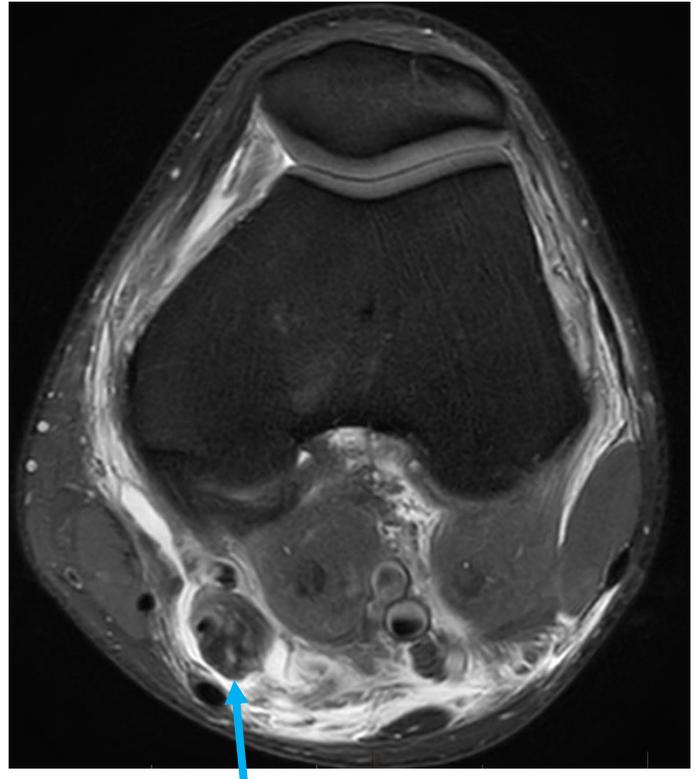
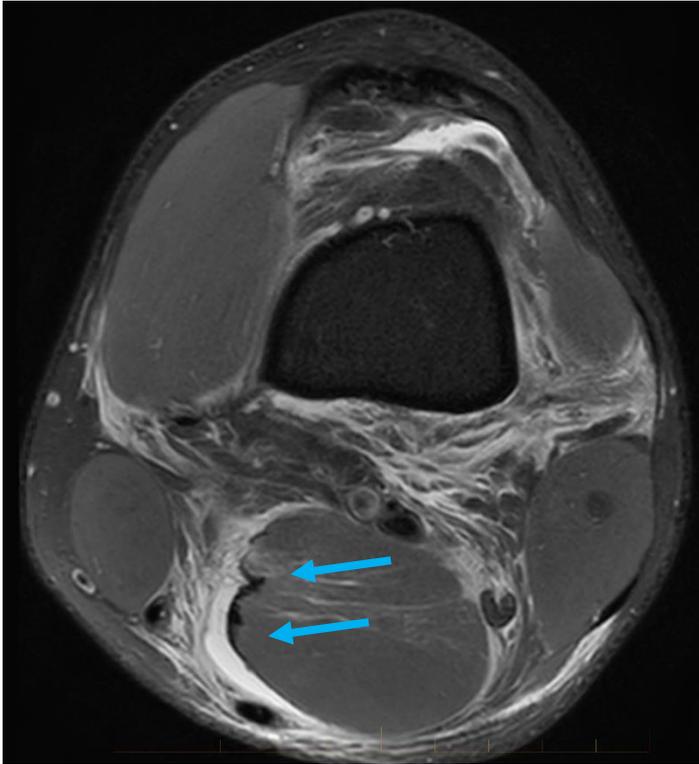


**TOP LEFT:** Sagittal T2 weighted imaging shows knee hyper-extension type bone marrow contusions of the anterior aspects of both the tibial plateau and femoral condyle.

**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