

MRI IN MENISCAL INJURIES OF THE KNEE –A PICTORAL ASSAY

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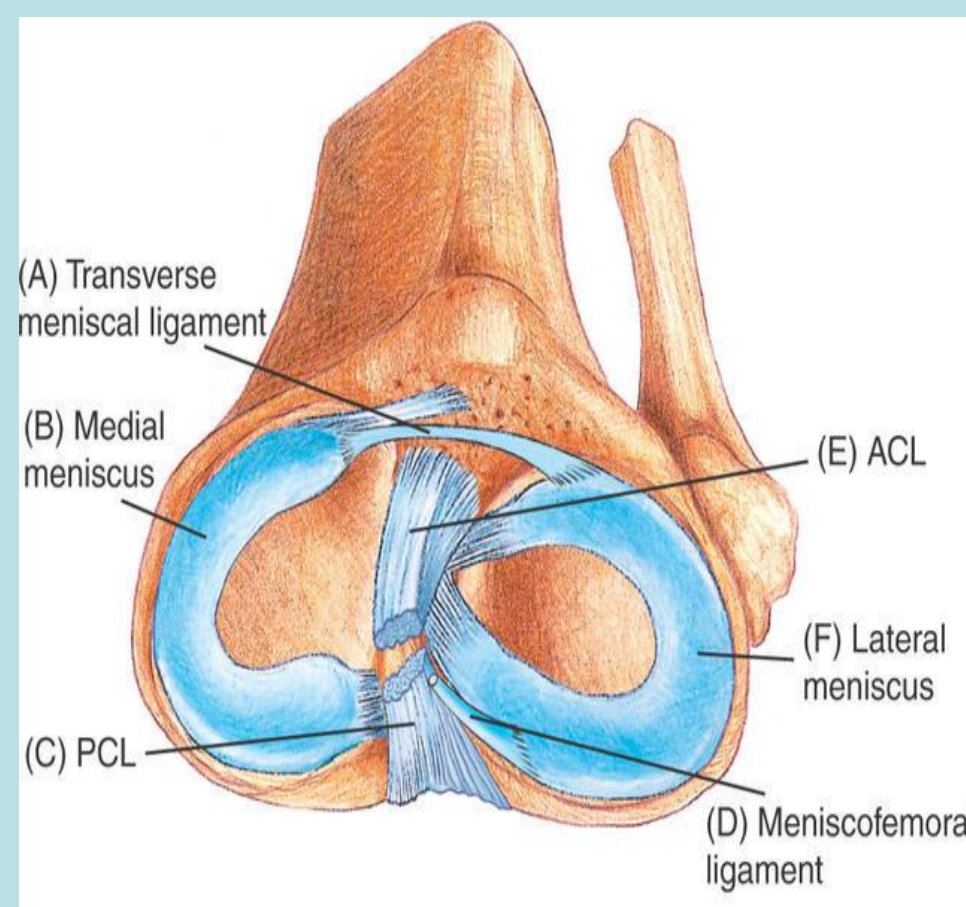
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NORMAL MRI APPEARANCE OF MENISCI



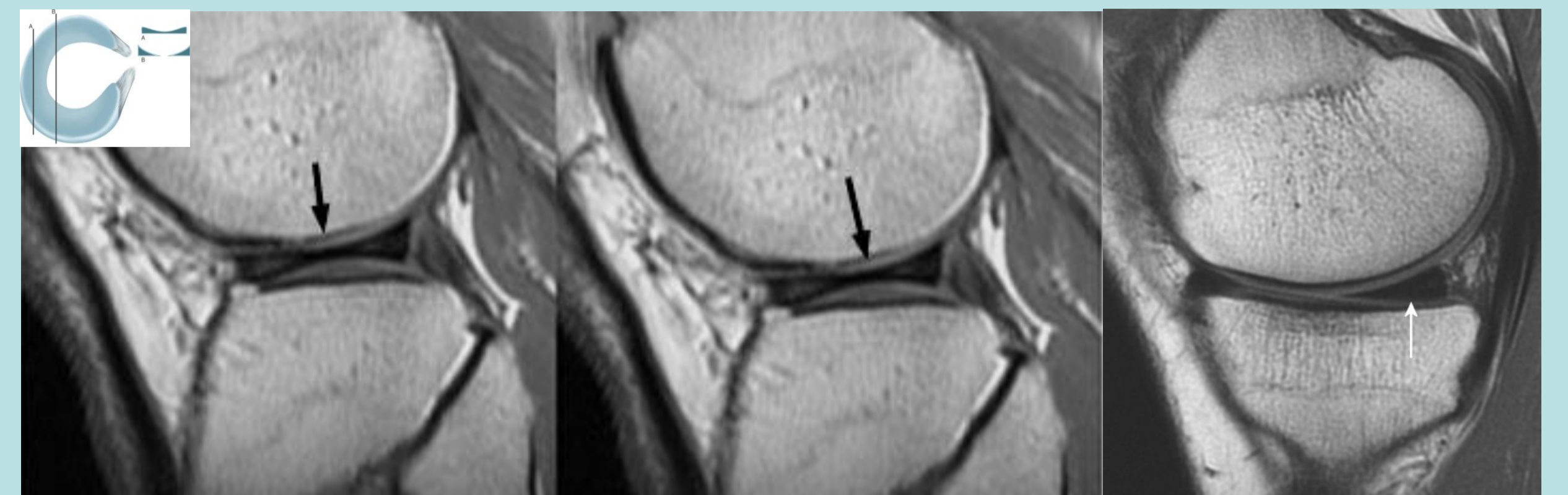
Low signal intensity on all MRI pulse sequences.

Best demonstrated on short TE sequences (< 20 ms) such as T₁, Proton density, Gradient echo sequences.

FSE (Echo train length < 4-5) and inter-echo spacing minimized to reduce blurring effect.

Sagittal – anterior and posterior horn
Coronal – body.

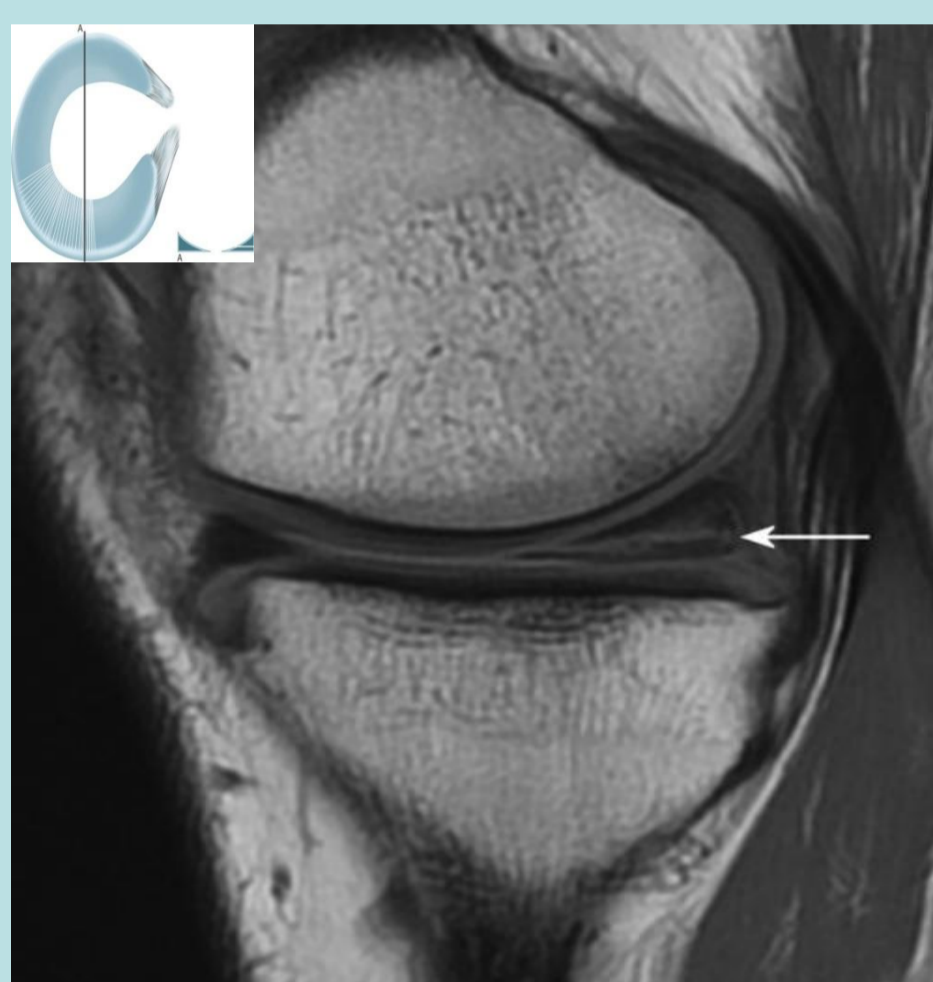
BOW TIE CONFIGURATION



Consecutive sagittal PD MR 4-mm-thick images, at the periphery of the meniscus shows Bow tie configuration and at the central aspect, a Triangular configuration.

TYPES OF MENISCAL TEARS

HORIZONTAL TEAR



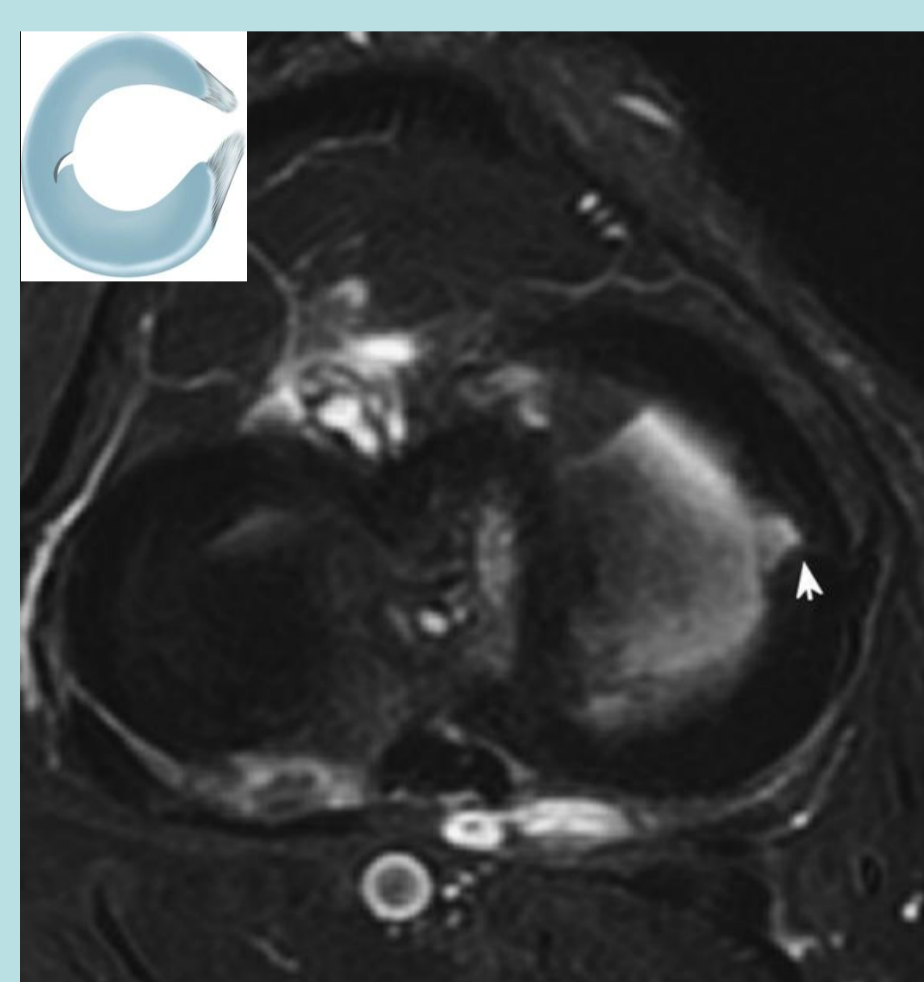
Sagittal FSE PD image shows medial meniscal tear with extension to the free apical margin.

VERTICAL TEAR



Vertical tear in the posterior horn of lateral meniscus seen on this sagittal FSE PD MR image

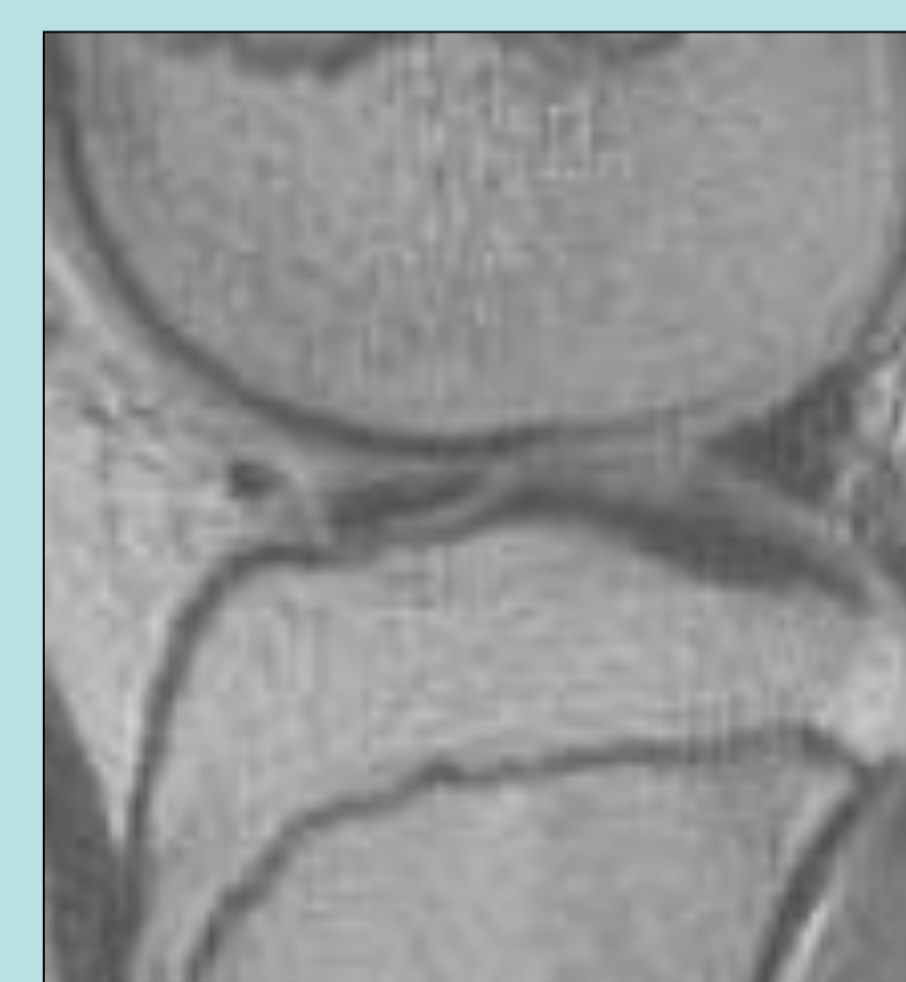
PARROT BEAK TEAR



Axial T2 fat suppressed MR image Radial tear with a small longitudinal extension along the meniscus.

PITFALLS IN DIAGNOSIS

TRANSVERSE LIGAMENT



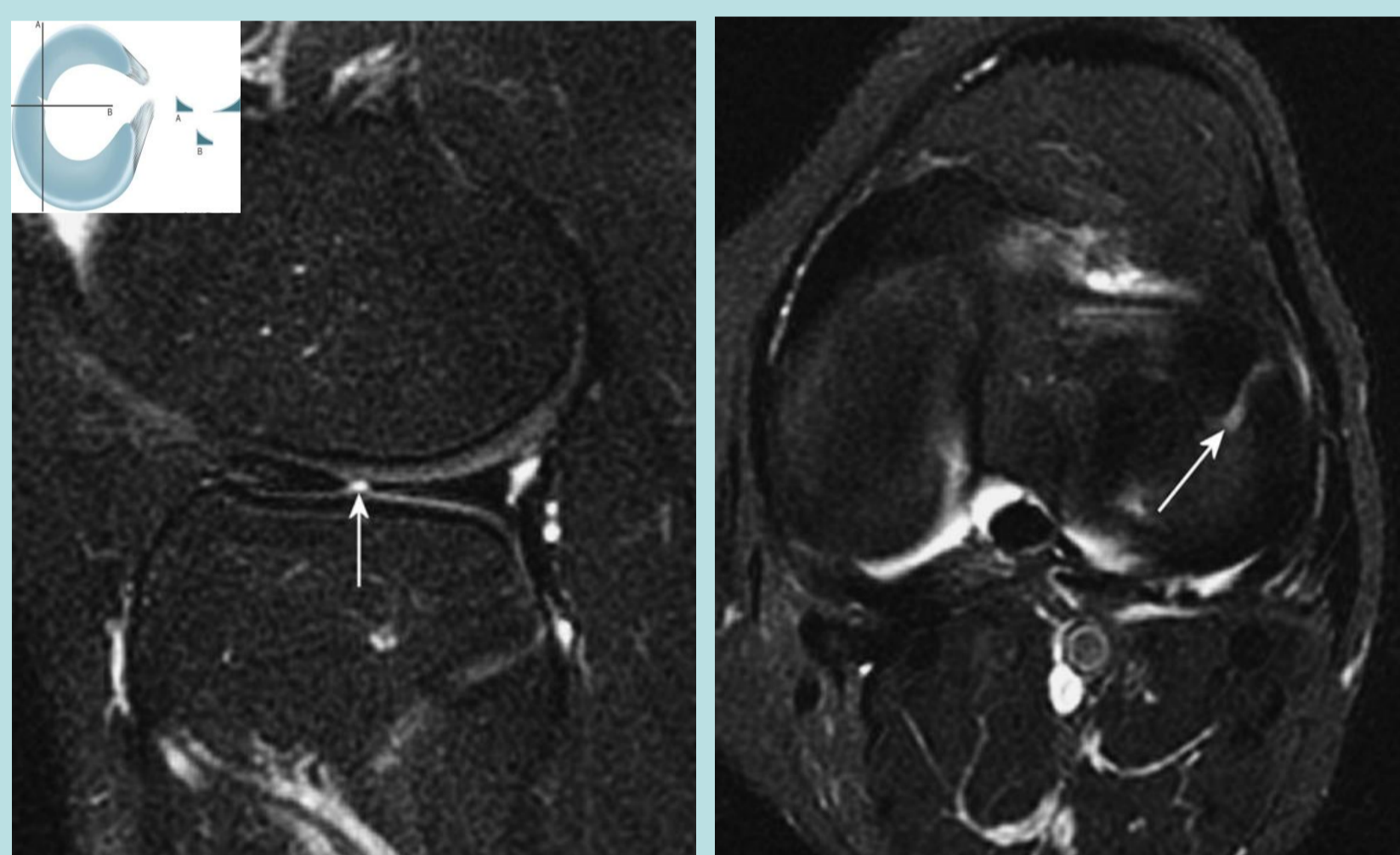
Sagittal PD MR image. Transverse ligament anterior to the meniscus - simulating a flipped bucket handle tear.

POPLITEUS TENDON



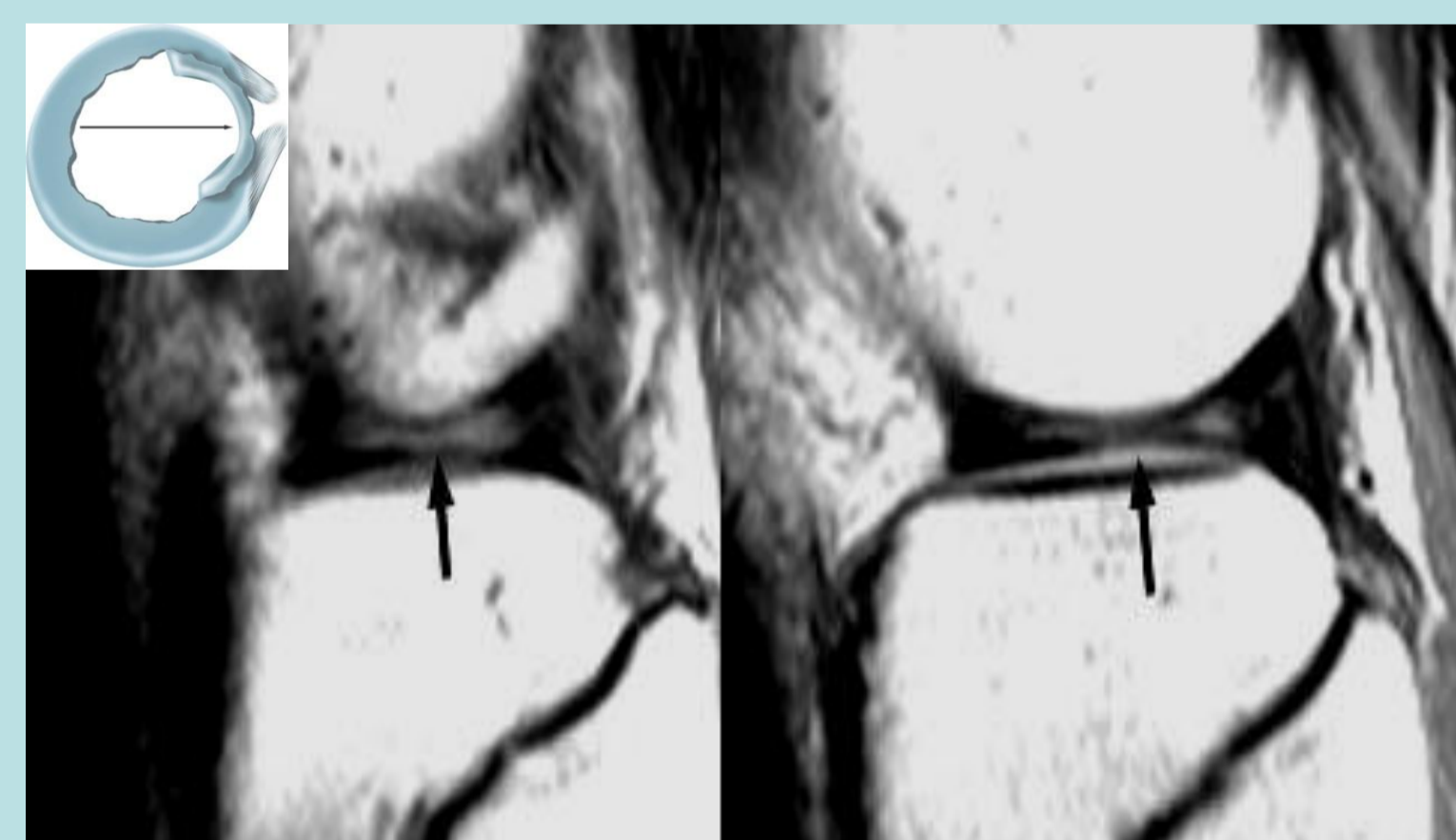
Sagittal PD MR image. Seen above the posterior aspect of the lateral meniscus only on the most lateral sagittal image.

RADIAL TEAR



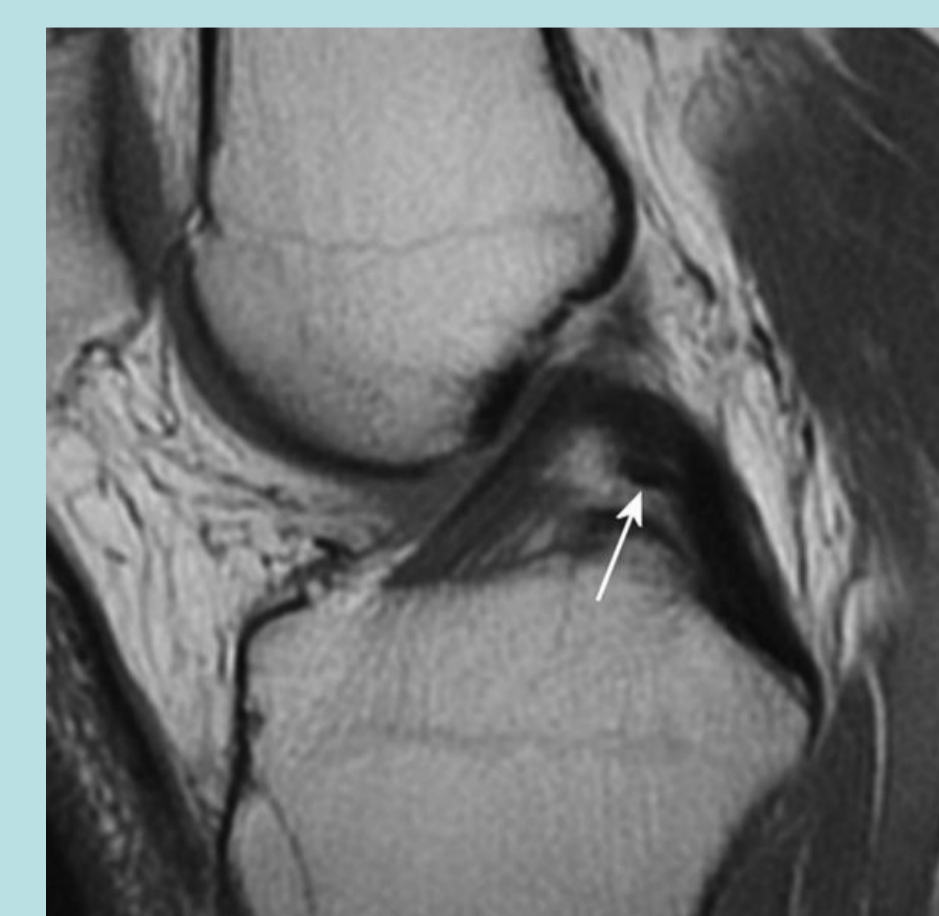
Tear along the free edge of the meniscal body, gives a blunted appearance on the sagittal and a tear cleft on axial T2 fat suppressed FSE MR images.

BUCKET HANDLE - ABSENT BOW TIE SIGN



Central segment of a bucket handle tear displaced with an intact bow tie sign seen on only one sagittal image.

LIGAMENT OF HUMPHREY



Sagittal PD MR image at most medial part of the posterior horn of the lateral meniscus, anterior to PCL.

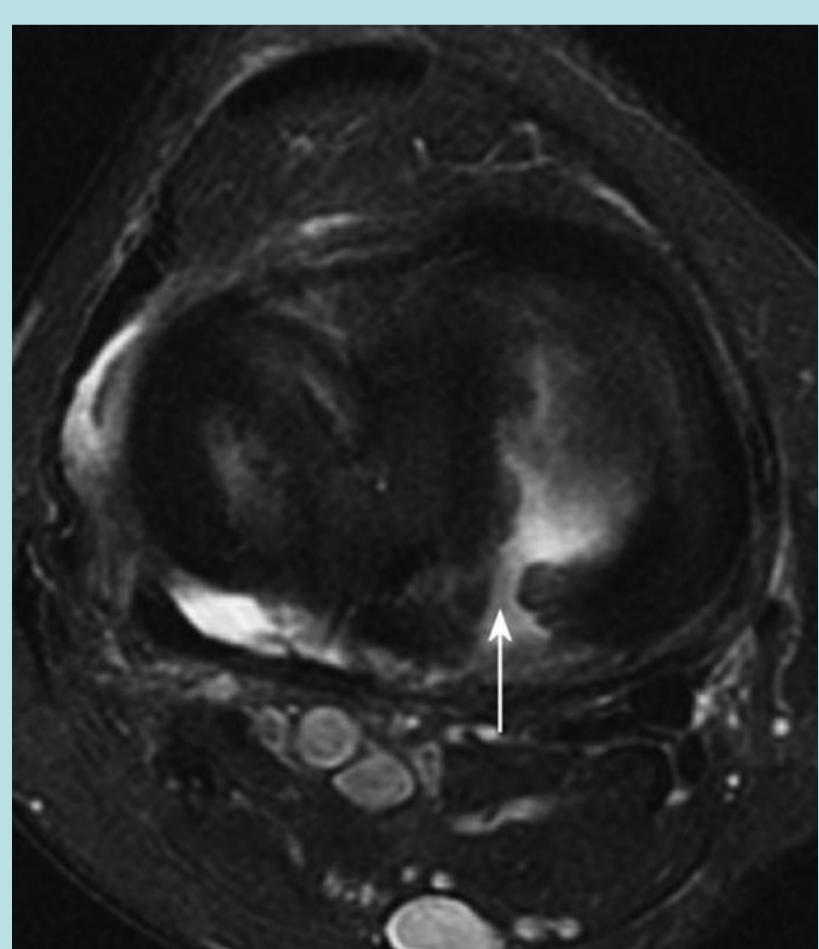
LIGAMENT OF WRISBERG



Coronal fat saturated PD MR image. Normal meniscolfemoral ligament simulating a displaced meniscal fragment.

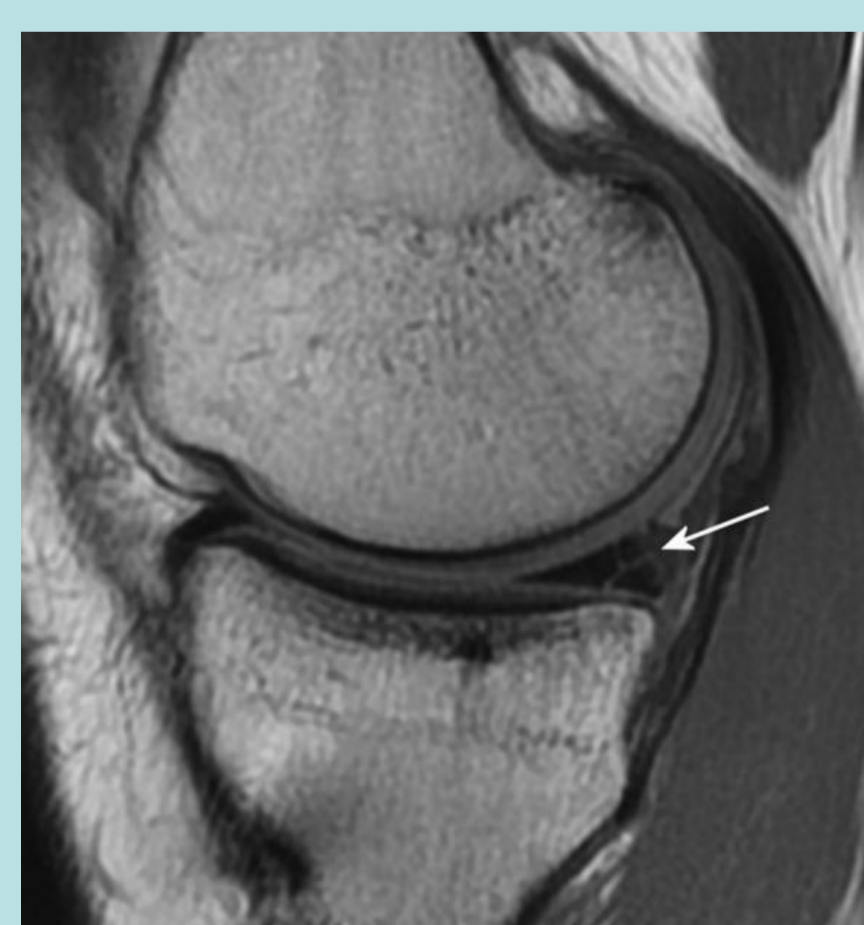
UNSTABLE MENISCAL TEARS

MENISCAL ROOT TEAR



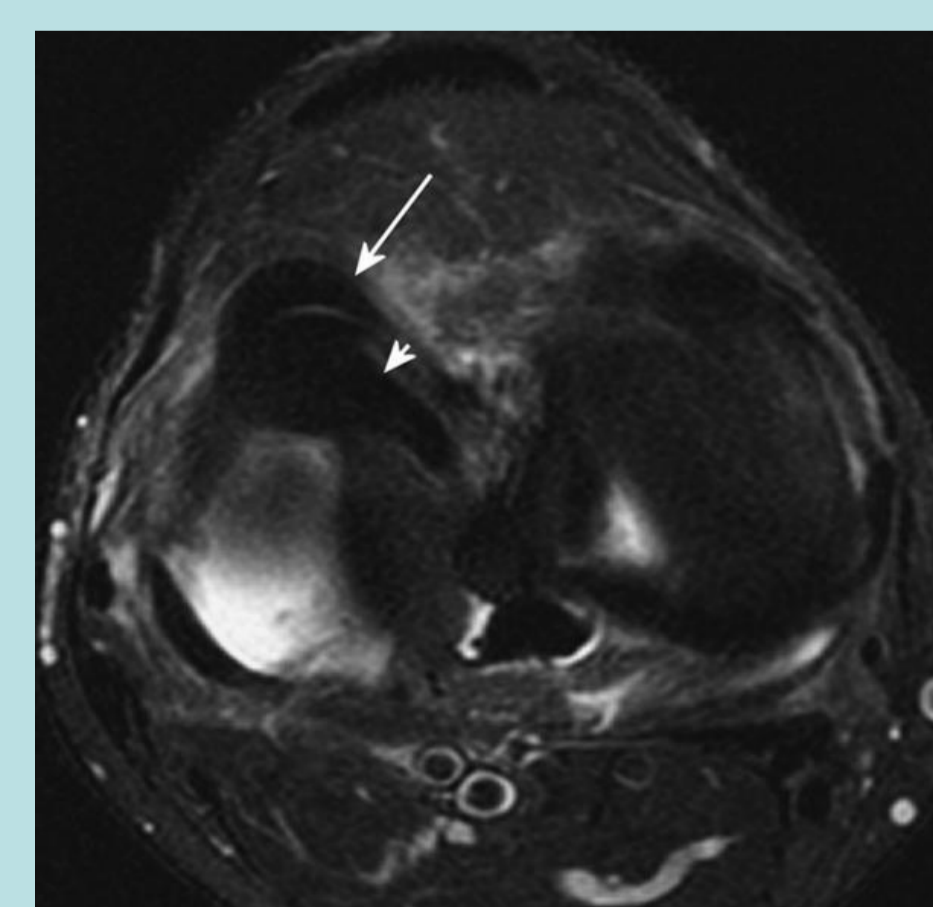
Axial T2 fat sat image. Tear of the meniscal root at the central attachment may cause major extrusion (>3 mm).

COMPLEX MENISCAL TEARS



Sag PD FSE image. multiple clefts extending in several planes, to both the superior and inferior articular surfaces

DISPLACED MENISCAL FRAGMENT



Lateral meniscal tear with an anteriorly displaced fragment located posterior to the anterior horn of the lateral meniscus.

STOLLER GRADING

GRADE ABNORMAL INTRAMENISCAL SIGNAL

- 0 Normal meniscus has a uniform low signal intensity.
- I Globular/circular signal not extending to the meniscal surface.
- II Linear signal not extending to the meniscal surface.
- III Intrameniscal signal extending to the meniscal surface.

PROGNOSTIC FACTORS

TEAR LOCATION

- In the periphery of the meniscus (within 3 mm of its capsular surface) has the highest probability of healing.
- In the inner, avascular portion of the meniscus (more than 5 mm from capsule) heal poorly.
- Unstable tears require surgical management and carries poor prognosis.

TEAR MORPHOLOGY AND LENGTH

- Vertical tears have best prognosis.
- Tears in the periphery and measuring less than 1 cm heals on conservative treatment.

CONCLUSION

MRI is the best imaging modality to characterise the meniscal injuries and to plan arthroscopic or open surgical repair.

References

- Rubin DA: Magnetic resonance imaging of chondral and osteochondral injuries. Top Magn Reson Imaging 1998;9:348-359
Kettering JM, Towers JD, Britton CA: MR imaging of knees having isolated and combined ligament injuries. AJR, 1998; 170:1207-1213