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Knee Arthroscopy: The “Crevice Sign,” a New Pathognomonic Sign for Unstable Posterior Medial Meniscal Tear in Anterior Cruciate Ligament Deficient Knees

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Disclosures:

M Clatworthy:- Arthrex: royalties.

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Introduction

- Medial Meniscal (MM) injuries are commonly associated with Anterior Cruciate Ligament (ACL) rupture.
- Fixation of associated MM tears in ACL reconstruction (ACLR) reduces post traumatic osteoarthritis[1].
- Decision to leave, fix or resect such tears is often based on meniscal stability at the time of surgery.
- This in itself can be subjective and technically challenging in a tight knee.
- We describe a horizontal cartilage fissure of the medial femoral condyle that is associated with unstable MM tears.
- We have named this the Crevice Sign, and it is pathognomonic of an unstable MM tear.

Pathogenesis Hypothesis

- The unstable MM tear occurs as a result of the pivoting manoeuvre that occurs with an ACL-deficient knee.
- The lateral femur subluxes posterolaterally.
- The medial femoral condyle pivots, tearing the posterior horn of the medial meniscus.
- Consequently, the anterior edge of the medial meniscus digs into the articular cartilage of the medial femoral condyle, resulting in a longitudinal split

Description of the crevice sign

- During ACL reconstruction the whole cartilage surface of the medial femoral condyle is inspected.
- The “crevice sign” appears to be 1 or 2 longitudinal cartilage fissures on the distal medial femoral condyle (Fig 1+2).
- Ensure stability and depth by probing.
- Optimal visualisation is with the patient’s knee flexed at 90.
- This sign is NOT observed with an intact MM, thus it can be considered pathognomonic for an unstable MM tear.
- The“crevice sign” or medial subchondral bone oedema related to this fissure are not visible on magnetic resonance imaging.

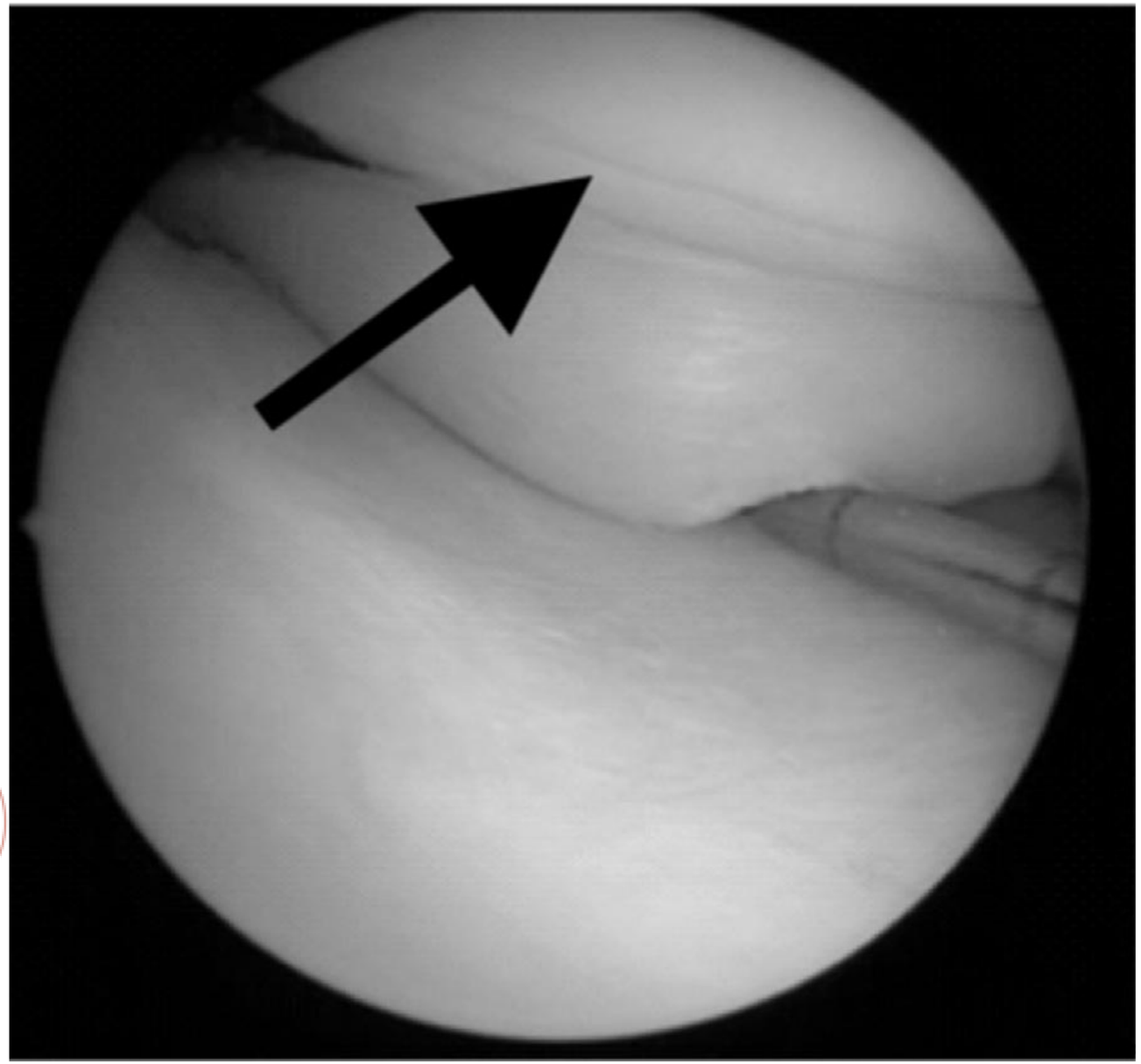

Fig 1. Scope view right knee (medial compartment). Visualisation of the “crevice sign” (arrow): 1 or 2 longitudinal fissures of the distal medial femoral condyle. The meniscal tear can be displaced to the crevice proving the meniscal involvement in the cartilage split.

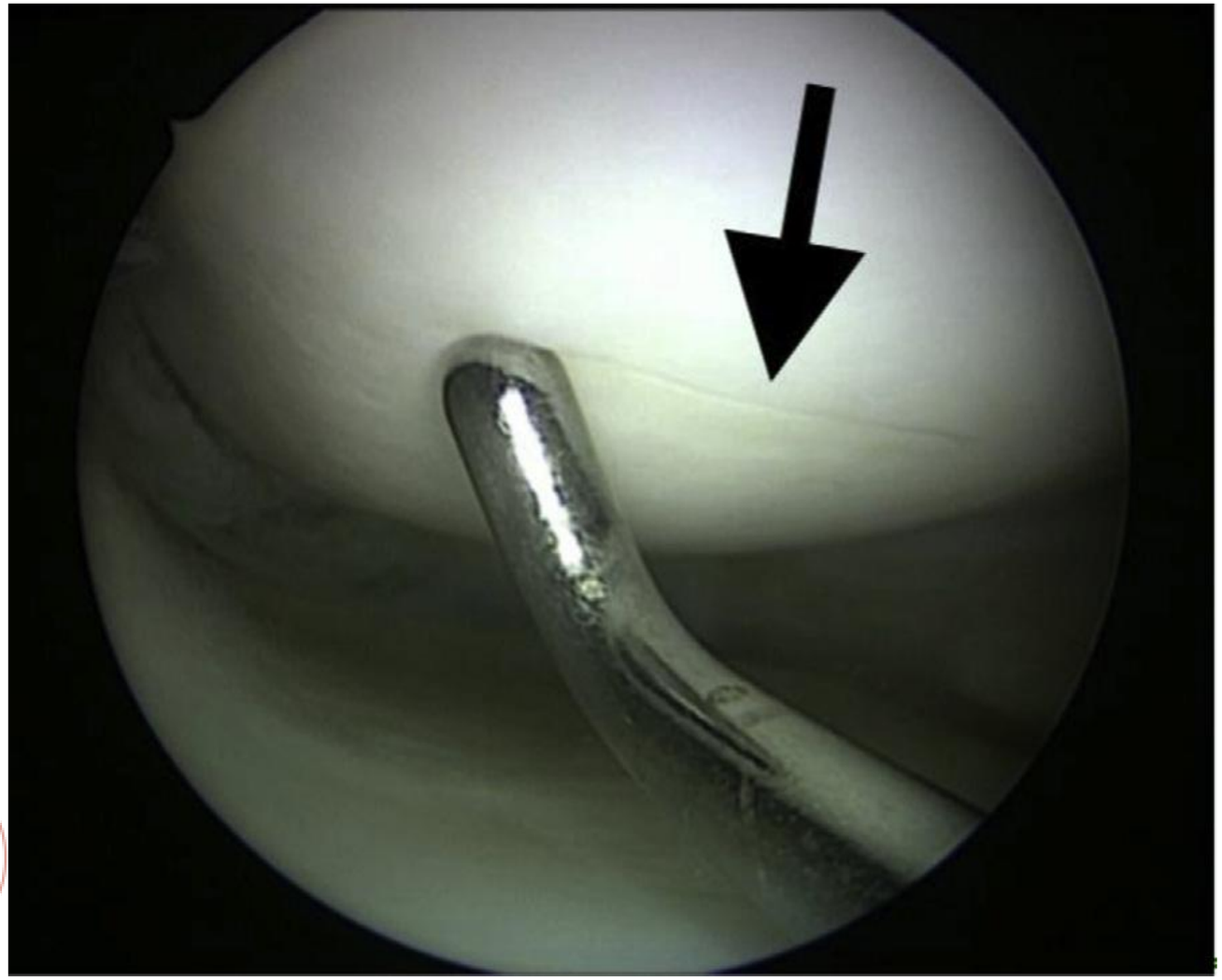

Fig 2. Scope view right knee (medial compartment). The arrow shows the longitudinal cartilage split (“crevice sign”) on the medial femoral condyle.

Discussion

- To our knowledge this is the first time this sign has been described in the literature.

- Biomechanical studies show the increased contact pressures between MM and femoral condyle during knee flexion[2].

- Meniscal repair is advocated during ACL reconstruction[3] improving stability, force distribution, proprioception and joint lubrication[3,4].

- Long term studies have also shown a dramatic reduction in osteoarthritis risk if the MM is fixed at the same time as ACLR[1].

Conclusions

- The “crevice sign” is pathognomonic for an unstable longitudinal MM tear in ACL-deficient knees.

- If this sign is observed during arthroscopic procedure, surgeons should ensure they probe the MM carefully and treat accordingly.

References

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