

Displacement of the Posterior Horn of the Lateral Meniscus into Posterolateral Compartment: An Unusual Injury Pattern

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Abstract We report a case of acute ACL injury with an unusual lateral meniscal tear pattern. The entire posterior horn of the lateral meniscus was avulsed from its attachments while remaining in continuity with the body of the meniscus. It was displaced posteriorly and laterally to the popliteus tendon so that it was not immediately visible at the time of arthroscopy. This type of displacement of the posterior horn of the lateral meniscus is difficult to identify at arthroscopy and has not previously been described in the literature to our knowledge. We recommend to surgeons who encounter an absent posterior horn of the lateral meniscus to consider this injury pattern.

Keywords meniscal pathology

Introduction

Many varieties of lateral meniscal tears have been reported [1–5]. Lateral meniscal tears are particularly common after ACL injury [3, 4, 6] and have been found to be slightly more common compared to medial meniscal tears in acute ACL injured knees [7, 8]. We report a case of acute ACL injury with an associated lateral meniscal tear where the entire posterior horn was avulsed from its attachments while remaining in continuity with the body of the meniscus. It was displaced posteriorly and laterally to the popliteus tendon so that it was not immediately visible at the time of arthroscopy. A wide variety of meniscal tear patterns have been described in the literature [9]. This type of displacement of the posterior horn of the lateral meniscus has not previously been described in the literature to our knowledge.

Case report

A 24-year-old law student was playing basketball when he had a sudden deceleration injury. He felt a pop in his left knee and was helped off the court. He presented 2 days after the injury with a large effusion, range of motion 10–40°, and a positive (+2) Lachman test. MRI indicated complete ACL tear with a large chondral shear of the medial femoral condyle and a complex tear of the posterior horn lateral meniscus (Fig. 1a and b). Surgery was recommended for loose body removal, microfracture of the medial femoral condyle, lateral meniscal surgery, and ACL reconstruction with bone-patellar tendon–bone autograft.

Prior to surgery, he was treated with a hinge knee brace to allow the MCL injury to heal. Four weeks following the injury, the MCL had healed and was stable to valgus stress, symmetrical to the other side. At that point, surgery was recommended and was undertaken 5 weeks after the injury.

At the time of surgery, diagnostic arthroscopy was performed, which revealed normal articular surfaces of the lateral compartment. The posterior horn of the lateral meniscus was absent. The body of the meniscus seemed to continue directly posteriorly and laterally to the popliteus tendon without evidence of a tear (Fig. 2). The surgeon was not able to generate sufficient force with the probe to deliver the entrapped posterior horn from behind the popliteus, so a grasper was used. This allowed for reduction of the posterior horn into its normal anatomic position. When the last bit of the posterior horn was delivered, it reduced suddenly into its position, completely devoid of any soft tissue attachment aside from the body of the meniscus (Fig. 3). Because the entire posterior horn was devoid of any soft tissue attachments, the tear was deemed unacceptable for repair, and the fragment was excised.

The loose body was identified and removed. It was a chondral fragment that corresponded in size to the femoral condyle injury. The large medial femoral condyle articular cartilage shear injury was also identified, and microfracture

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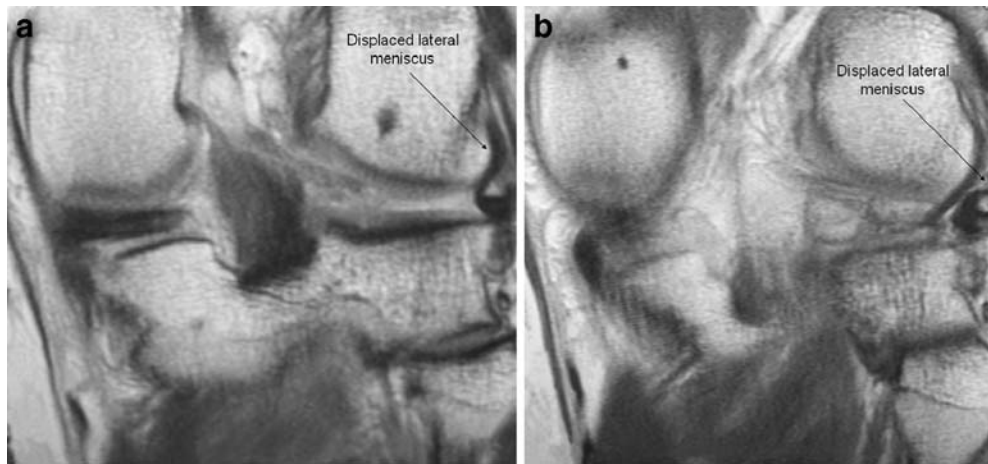


Fig. 1. **a** Coronal MRI of the left knee. **b** Coronal MRI of the left knee, posterior to the prior image (**a**)

surgery was performed as planned. The ACL was reconstructed with patellar tendon autograft as well.

Rehabilitation after surgery included non-weight bearing as well as continuous passive motion for a minimum of 6 h daily for the first 6 weeks. This rehabilitation protocol was carried out to encourage healing of the microfracture of the medial femoral condyle. At 6 weeks, full weight bearing as tolerated with crutches was initiated, and when the patient was able to walk with a normal gait, the crutches were discontinued. Rehabilitation then focused on strengthening with return to running when strength was sufficient. This occurred at 5 months, and agility exercises were progressed until return to sport at 9 months following surgery.

Discussion

Lateral meniscal injuries are very common in association with ACL injury [8, 10]. This pattern of lateral meniscal tear where the posterior horn remains attached only to the body with no other soft tissue attachments and with the posterior horn displaced posterior and lateral to the popliteus tendon

has not been previously reported. This injury pattern is important to recognize since the displaced posterior horn of the meniscus is not easily identifiable, and it may appear as if it is absent. Although lateral meniscal tears have a high incidence of healing in ACL reconstructed knees [2], the entire posterior horn was displaced, including the posterior aspect and the root attachment. In this case, the blood supply was completely disrupted [7], and the fragment was essentially loose. Repair is therefore not indicated for this injury as the chance of healing would be extremely low.

Careful study of the pre-operative MRI may assist the surgeon to identify that the posterior horn is displaced into the back of the knee. In this case, we were able to identify a complex tear of the lateral meniscus but did not appreciate pre-operatively that the entire posterior horn of the lateral meniscus was displaced the way it was found at surgery. Reduction of the fragment and repair if possible or excision if it is not repairable as in this case is important as a retained fragment in the back of the knee is extremely likely to cause symptoms if not removed from that position.

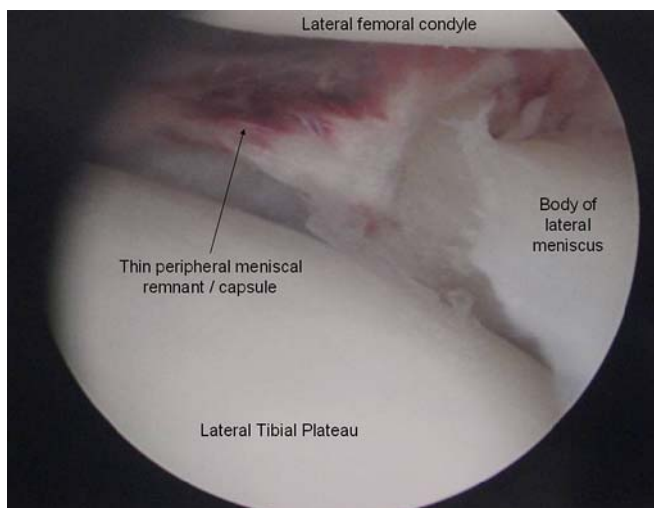


Fig. 2. Arthroscopic view of the lateral compartment

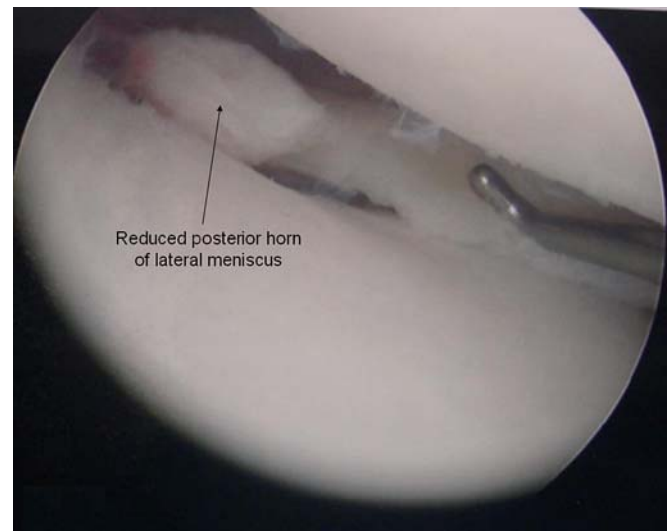


Fig. 3. Arthroscopic view of the lateral compartment after reduction of the posterior horn

Surgeons who are performing arthroscopy for a patient who has had a lateral meniscal injury and who do not find a posterior horn of the lateral meniscus present should consider this injury pattern at the time of surgery. Unfortunately, this lateral meniscal injury is not repairable, and resection of such a large amount of lateral meniscus can be linked with early degenerative changes in the lateral compartment and associated symptoms.

References

1. Buseck MS, Noyes FR (1991) Arthroscopic evaluation of meniscal repairs after anterior cruciate ligament reconstruction and immediate motion. *Am J Sports Med* 19(5):489–494 doi:[10.1177/036354659101900512](https://doi.org/10.1177/036354659101900512)
2. Cannon WD Jr, Vittori JM (1992) The incidence of healing in arthroscopic meniscal repairs in anterior cruciate ligament-reconstructed knees versus stable knees. *Am J Sports Med* 20(2):176–181 doi:[10.1177/036354659202000214](https://doi.org/10.1177/036354659202000214)
3. Duncan JB, Hunter R, Purnell M et al (1995) Meniscal injuries associated with acute anterior cruciate ligament tears in alpine skiers. *Am J Sports Med* 23(2):170–172 doi:[10.1177/036354659502300208](https://doi.org/10.1177/036354659502300208)
4. Poehling GG, Ruch DS, Chabon SJ (1990) The landscape of meniscal injuries. *Clin Sports Med* 9(3):539–549
5. Terzidis IP, Christodoulou A, Ploumis A et al (2006) Meniscal tear characteristics in young athletes with a stable knee: arthroscopic evaluation. *Am J Sports Med* 34:1170–1175 doi:[10.1177/0363546506287939](https://doi.org/10.1177/0363546506287939)
6. Ichinohe S, Yoshida M, Murakami H et al (2000) Meniscal tearing after ACL reconstruction. *J Orthop Surg (Hong Kong)* 8:53–59
7. Bach BR Jr, Bush-Joseph C (1992) The surgical approach to lateral meniscal repair. *Arthroscopy* 8(2):269–273 doi:[10.1016/0749-8063\(92\)90050-L](https://doi.org/10.1016/0749-8063(92)90050-L)
8. Kim HJ, Rodeo SA (2003) Approach to meniscal tears in anterior cruciate ligament reconstruction. *Orthop Clin North Am* 34(1):139–147 doi:[10.1016/S0030-5898\(02\)00063-9](https://doi.org/10.1016/S0030-5898(02)00063-9)
9. Fodor DW, Vagal AS, Wissman RD et al (2008) Meniscal gymnastics: common and uncommon locations of meniscal flip and flop. *Curr Probl Diagn Radiol* 37(1):15–25 doi:[10.1067/j.cpradiol.2007.05.002](https://doi.org/10.1067/j.cpradiol.2007.05.002)
10. Ahn JH, Kim SH, Yoo JC et al (2004) All-inside suture technique using two posteromedial portals in a medial meniscus posterior horn tear. *Arthroscopy* 20:101–108 doi:[10.1016/j.arthro.2003.11.008](https://doi.org/10.1016/j.arthro.2003.11.008)