



Injuries of the posteromedial bundle of the PCL after knee hyperextension trauma: A new clinical entity based on an original case series

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Knee hyperextension injuries

Previous studies reported that, in knee hyperextension trauma, the ACL, the PCL, the oblique popliteal ligament and the posterior capsule may be injured^{1,4,5,9}.
Only partial thickness tears of the PCL were observed.



Purpose

To describe an uncommon triad of clinical signs in patients presenting with persistent pain and inability to resume physical activities after knee hyperextension trauma, which could be consistent with a partial PCL injury of the posteromedial bundle (PMB)



Case series (n=12)

- 7 men / 5 women
- 11 sports injuries / 1 traffic accident
- Median age: 18.5 years (Q1-Q3: 16-26 years)
- Median BMI: 23 kg/m² (Q1-Q3: 20-24 kg/m²)
- Median time after trauma: 4 months (Q1-Q3: 2-11 months)
- MRI (n=8 with two MRIs) and medical visits ex domo before
- **Absence of structural lesions (MRI) explaining symptoms**
- **Persistent pain and inability to resume sporting activities**



Clinical examination

Clinical examination of injured knee normal at 90° of knee flexion + uncommon triad of 3 signs in all patients close to extension



Grade 1+ anterior-posterior laxity around 10-20° of knee flexion with firm end point



Grade 1+ tibiofemoral step-off sign with a posterior drawer at 10-20° of knee flexion



Increased knee hyperextension compared to contralateral side

Additional investigations

- Verification of all MRIs - without findings
- Dynamic X-ray (n=4) – without findings
- Anterior knee laxity measurements (GNRB®) (n=6) – without findings
- Arthroscopy (n=8)

Confirmed the pseudo-lachman sign, a normal posterior laxity at 90° and an intact ACL

Associated lesions: 1 posterolateral corner injury, 3 medial meniscus injury, 2 lateral meniscus injury



Uncommon triad of clinical signs in patients with knee hyperextension trauma

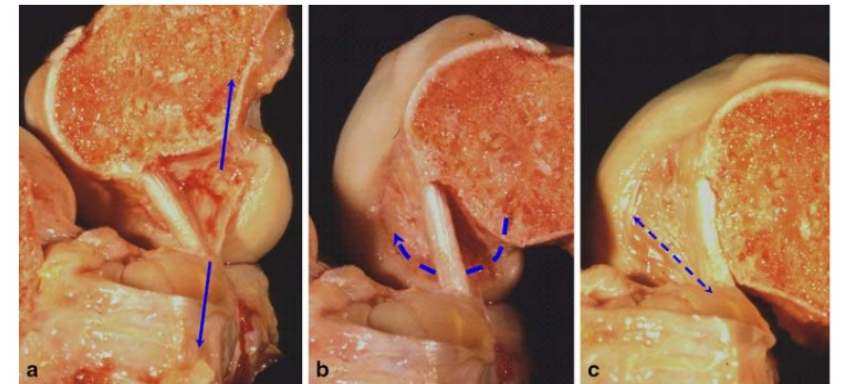
- Positive Pseudo-Lachman sign close to extension
- Positive step-off sign close to extension
- Increased hyperextension

→ Consistent with a PMB tear of the PCL

Anterolateral bundle (ALB): primary restraint to posterior tibial translation in flexion (30° – 120°)²

Posteromedial bundle (PMB) = secondary restraint of posterior tibial translation (PTT) at low degrees of flexion and hyperextension^{3,7}.

Isolated section of PMB: +1.1 mm PTT in extended knee⁸ → only complete PCL tears can lead to an excessive PTT



Amis et al. KSSTA 2006

If case of hyperextension knee trauma with persistent pain, inconclusive MRI, standard clinical examination

- Extend investigations close to knee extension
- Look for uncommon signs which may be associated to a tear to the posteromedial bundle of the PCL

CASE REPORT

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Injuries of the posteromedial bundle of the posterior cruciate ligament after knee hyperextension trauma: A new clinical entity based on an original case series

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**Thank you for reading this
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