

# Epidemiology and diagnosis of lateral root tears

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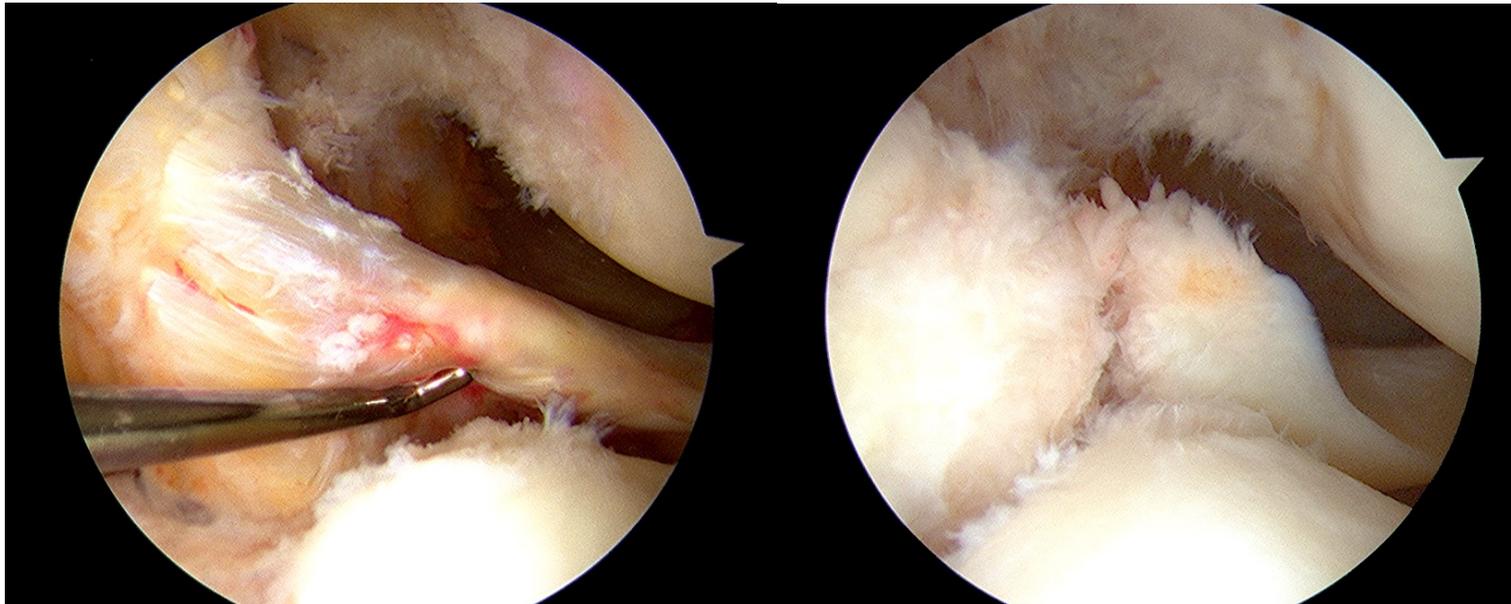
LYON **ORTHO** CLINIC





# What is a root tear ?

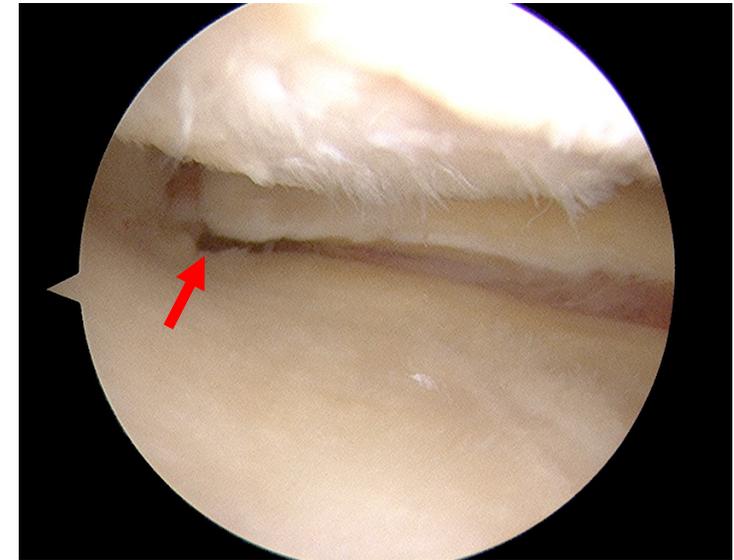
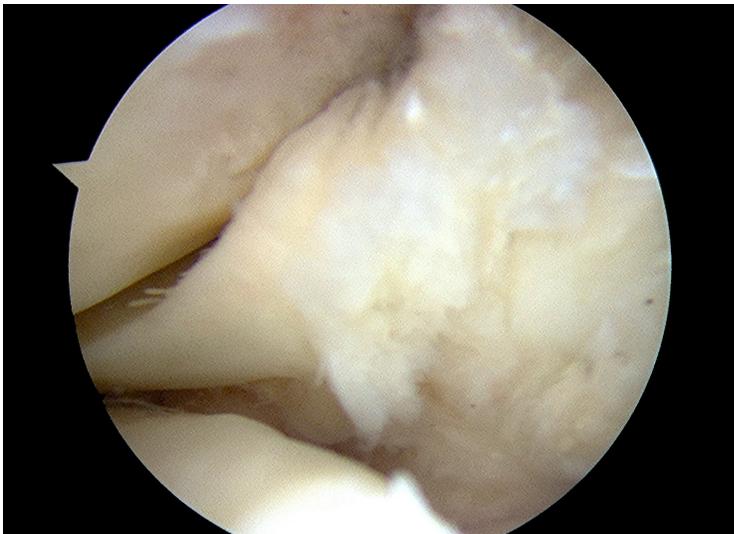
Defined as an avulsion injury of the tibial insertion of the meniscus or a radial tear of the meniscus close from the insertion of the meniscus onto the tibial plateau (1 cm)





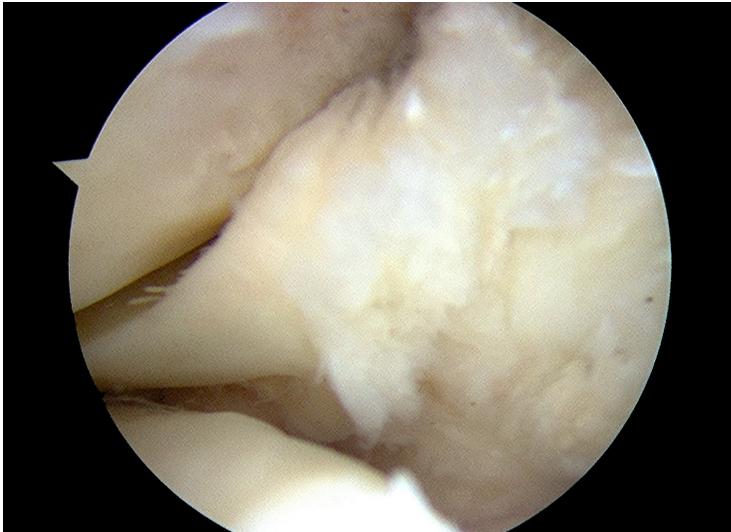
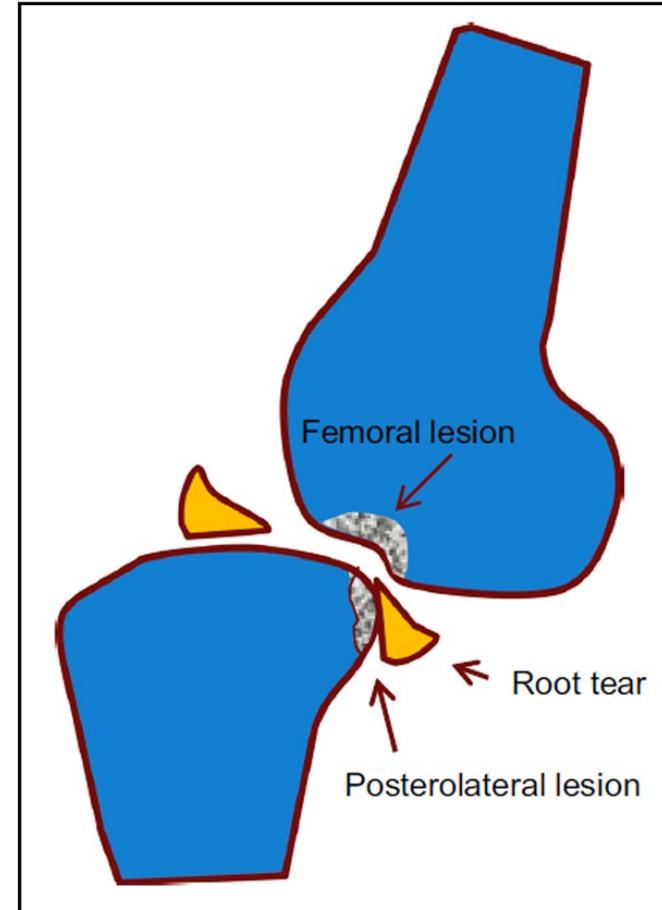
# Posterior Lateral Meniscus Root Tear

MM root tears usually degenerative and found in middle-age



LM tears are usually traumatic and are associated with ACL tears

Courtesy C Brown

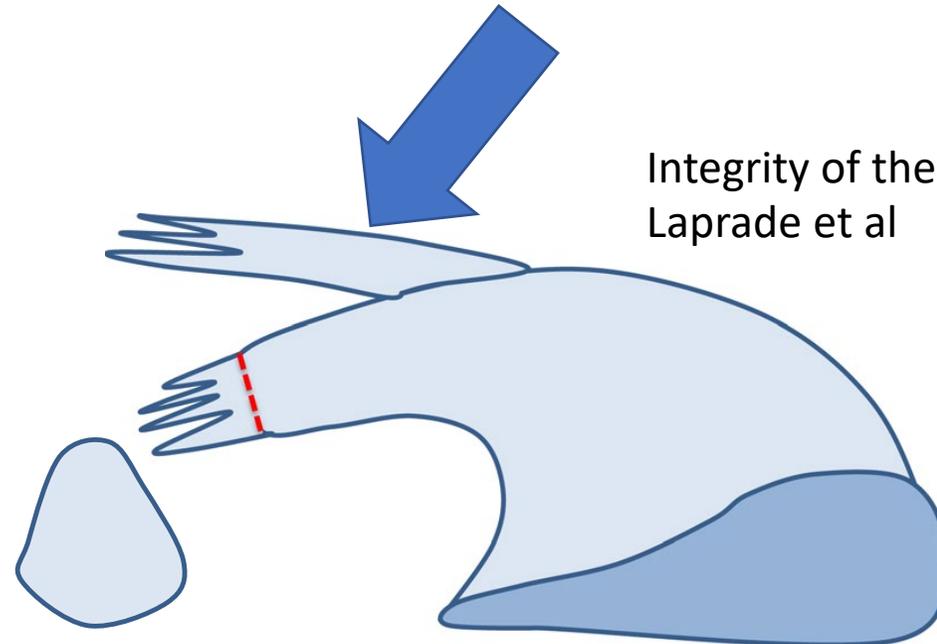


LM tears are usually traumatic and are associated with ACL tears



# Lateral root tears

An important difference between the medial and lateral meniscus is the additional attachment of the posterior lateral meniscal horn to the medial femoral condyle via the **Meniscoefemoral ligament (MFL)**



Integrity of the meniscoefemoral ligaments : 59% to 92%  
Laprade et al



# Prevalence

Knee Surg Sports Traumatol Arthrosc (2015) 23:119–125  
DOI 10.1007/s00167-014-2904-x

KNEE

## Posterior root tears of the lateral meniscus

Matthias J. Feucht · Gian M. Salzmann ·  
Gerrit Bode · Jan M. Pestka · Jan Kühle ·  
Norbert P. Südkamp · Philipp Niemeyer

Review

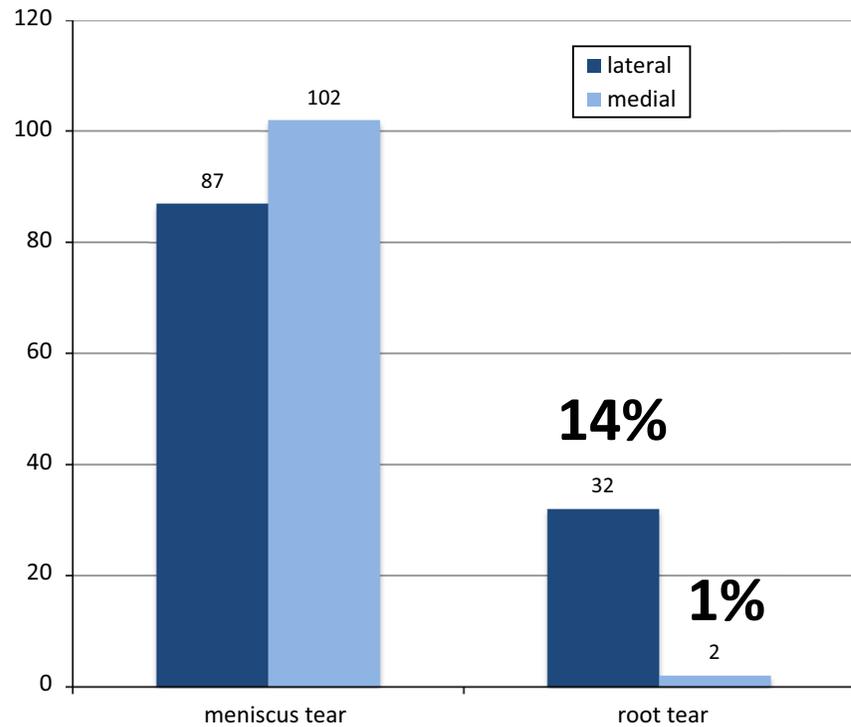
Posterior root tears of the LM

**7–12 %** of patients with a tear of the ACL



# Prevalence

n=228 ACLr



**Fig. 4** Diagram showing the prevalence of meniscus tears and root tears

Knee Surg Sports Traumatol Arthrosc (2015) 23:112–118  
DOI 10.1007/s00167-014-3467-6

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## Different patterns of lateral meniscus root tears in ACL injuries: application of a differentiated classification system

Philipp Forkel · Sven Reuter · Frederike Sprenger ·  
Andrea Achnich · Elmar Herbst · Andreas Imhoff ·  
Wolf Petersen



# Intact ACL

> [AJR Am J Roentgenol. 2009 Feb;192\(2\):480-6. doi: 10.2214/AJR.08.1300.](#)

## **MR diagnosis of posterior root tears of the lateral meniscus using arthroscopy as the reference standard**

[Arthur A De Smet](#)<sup>1</sup>, [Donna G Blankenbaker](#), [Richard Kijowski](#), [Ben K Graf](#), [Kazuhiko Shinki](#)

559 knees with MRI  
+ arthroscopic correlation

8 % of patients with an ACL tear  
**Only 0.8 % of patients with an intact ACL**



# Prevalence

2021 *Review*

## **Clinical, Radiographic, and Arthroscopic Outcomes of Surgical Repair for Radial and Avulsed Lesions on the Lateral Meniscus Posterior Root During ACL Reconstruction**

### **A Systematic Review**

Tong Zheng,\* MD, Guanyang Song,\* MD, Yue Li,\* MD, Zhijun Zhang,\* MD, Qiankun Ni,\* MD, Yanwei Cao,\* MD, Zheng Feng,\* MS, Hui Zhang,\*<sup>†</sup> MD, and Hua Feng,\*<sup>†</sup> MD

*Investigation performed at Sports Medicine Department, Beijing Jishuitan Hospital, Beijing, China*

Systematic review included 215 knees in 215 patients who underwent LMPR repair and ACLR

There were 139 **(64.7%) men** and 76 **(35.3%) women** with a **mean age of 28.7 years** (range, 24.6-34.5 years) across all studies



# Clinical examination

- **No specific clinical signs** : Pain, Joint line tenderness, posterolateral knee pain at full flexion, positive McMurray test
- Lateral meniscal extrusion at the lateral joint line when valgus stress is applied to the extended knee ?

Knee Surg Sports Traumatol Arthrosc (2011) 19:2072–2075  
DOI 10.1007/s00167-011-1550-9

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**A clinical sign to detect root avulsions of the posterior horn  
of the medial meniscus**

Romain Seil · Klaus Dück · Dietrich Pape



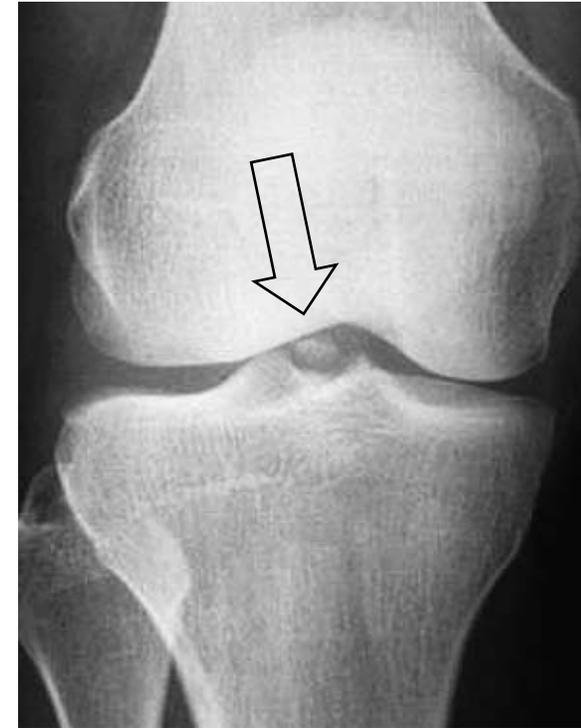
# X-Rays

Knee Surg Sports Traumatol Arthrosc (2007) 15:427–430  
DOI 10.1007/s00167-006-0179-6

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## **Arthroscopic reduction and internal fixation of an avulsion fracture of the posterior horn of the lateral meniscus**

Masayuki Hamada · Takahide Miyama ·  
Yukari Takeyasu · Shingo Tsutsumi ·  
Konsei Shino



**Fig. 1** An anteroposterior X-ray film of the right knee showed a small fragment at the intercondylar eminence



# MRI

- **Sensitivity of 94 %, Specificity of 89 %** (De Smet et al)

Assessing coronal and sagittal images on the lateral margin of the tibial eminence

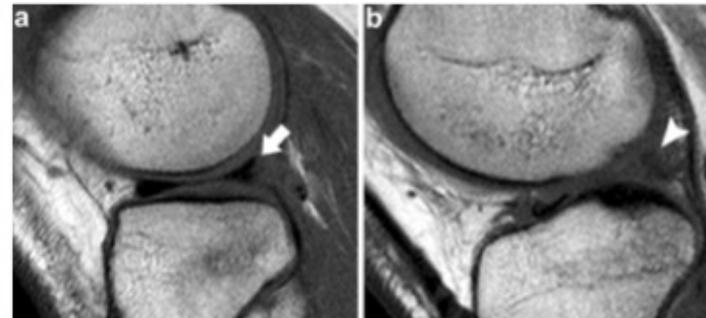
- **Direct sign : ghost meniscus sign**

« absence of the meniscus or high signal replacing the normal dark meniscal signal, with a normal meniscal signal shown on the immediately adjacent images »

> [AJR Am J Roentgenol. 2009 Feb;192\(2\):480-6. doi: 10.2214/AJR.08.1300.](#)

**MR diagnosis of posterior root tears of the lateral meniscus using arthroscopy as the reference standard**

Arthur A De Smet <sup>1</sup>, Donna G Blankenbaker, Richard Kijowski, Ben K Graf, Kazuhiko Shinki

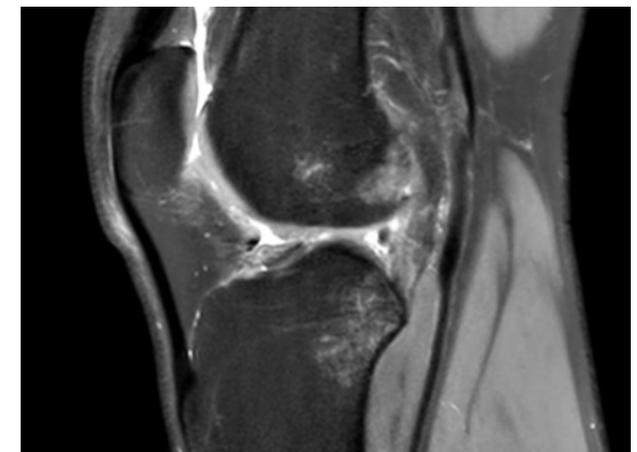
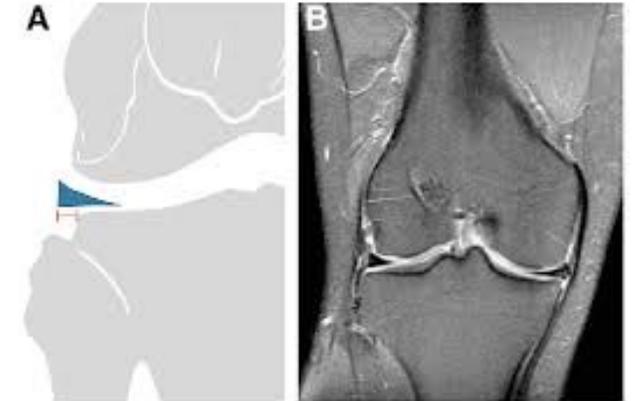




# MRI

## Indirect signs

1. **Meniscal extrusion** is observed infrequently
  - 40% for Ahn et al Arthroscopy 2010
  - 23 % for Brody et al Radiology 2006
2. Subchondral bone marrow edema





# Arthroscopic

- LMPRT Can only be proven by arthroscopic examination
- The posterior horn can be displaced superiorly (positive “lift-off” test) and anteriorly into the joint space
- The Integrity of the MFL is controlled

