

# ORTHOPAEDICS

## FOR PRIMARY HEALTH CARE



**Volume 2**

**Non-Emergency and Non-Trauma Pathology**

**Edited by Michael Held**

ORTHOPAEDIC DEPARTMENT  
UNIVERSITY OF CAPE TOWN

# Approach to a swollen, painful knee

By Temiloluwa Adewusi & Michael Held

## Learning objectives

- Describe the clinical findings associated with an anterior cruciate ligament (ACL) tear.
- Understand and develop an appropriate approach to a knee effusion.

## Case presentation

A 21-year-old male patient presents to your casualty unable to bear weight on his right knee a few hours after a twisting, non-contact injury during a soccer game. During this injury, he felt a “pop” in his knee, which showed immediate swelling. Thereafter, any attempt to put weight on the knee would cause it to “give out” and was associated with severe pain. On examination, you note diffuse swelling, with no other forms of visible trauma.



**Figure 1:** A right knee effusion (Source: [James Heilman](#), CC BY-SA)

The joint is tender to the touch. Furthermore, you note marked decreased range of motion. You confirm this by comparing it to the unaffected leg. The patient’s regional neurovascular examination is normal. The Lachman and anterior drawer tests show more

laxity than the uninjured knee. Both are positive of an ACL injury. You consider aspirating the joint (here you would see blood), but an anterior-posterior (AP) radiograph of the knee shows a flake fracture around the attachment of the anterolateral capsule (otherwise known as a Segond fracture). This is indicative of an ACL injury.



**Figure 2:** Lachman’s test (Source: [Mak-Ham Lam et al](#), CC BY-SA)

The gold standard is still a magnetic resonance imaging (MRI) scan to confirm the diagnosis. In facilities where such resources are not available, ultrasound is also an acceptable diagnostic modality with relatively high rates of specificity. It is important to note that the accuracy can vary depending on operator skill and should thus be used accordingly. Finally, a knee aspiration can be considered as both a

therapeutic and a diagnostic procedure. It can lower the patient's pain and improve the sensitivity of physical examination findings.



**Figure 3:** A Second fracture (Source: [Hellerhoff](#), CC BY-SA)

## Management

### Acute/supportive

Initial therapy includes analgesia, rest, ice and compression of the injured knee. In select cases, patients may need intra-articular lignocaine injections to better manage their pain. This also allows one to fully manipulate the knee during clinical examinations. Moreover, elevation of the affected lower extremity is also beneficial. Crutches are usually needed acutely to avoid weight-bearing.

### Definitive

Most active, younger patients will benefit from ligament reconstruction with autograft to protect the meniscus and cartilage from further injury and allow return to activities which can often take 8--12 months. Older, less active patients may be candidates for conservative non-surgical therapy. Here, treatment includes regular physiotherapy.

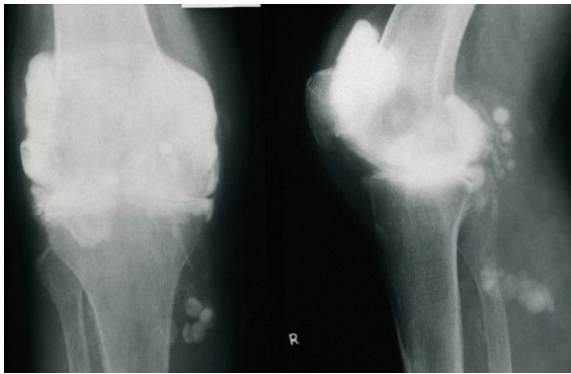
## Summary

One of the most important questions to ask is if the knee swelling or pain occurred acutely or is chronic. If acute, we need to ask if this was traumatic or atraumatic. In knee injuries, an important point to understand is if the swelling was sudden (blood – hemarthrosis) or delayed (effusion).

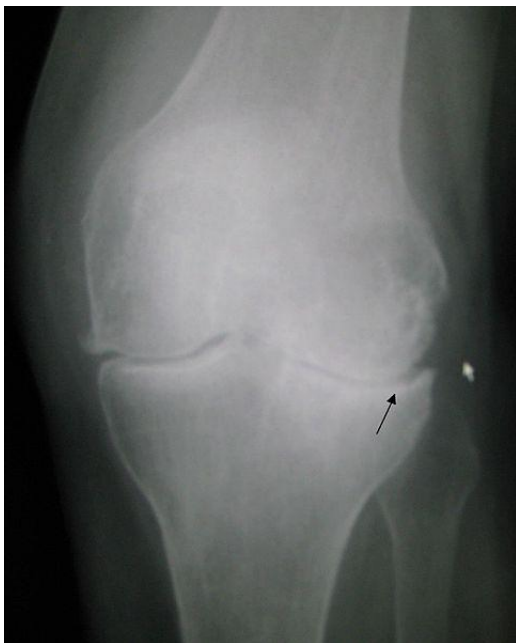
With sudden traumatic swelling, the injury is most commonly an intra-articular ligamentous injury. For example, ACL or patella dislocations or fractures. When imaging is inconclusive or not available, an aspiration can help to differentiate this further. When fat globules can be seen on the surface of blood in the syringe, a fracture should be suspected. With clear pathology is indicated on available imaging, joint aspiration should be avoided.

In delayed swelling (i.e. that evening or the next morning), meniscus surgery should be considered. With acute, atraumatic, isolated knee swelling, septic arthritis must be excluded. Other conditions which can mimic this are gout or tuberculosis (TB), but these conditions are often recurring and can also involve other joints. Here it is key to obtain diagnosis via aspiration or tissue biopsy with a better yield. This should be assessed for bacterial and TB microscopy, culture and sensitivities, TB polymerase chain reaction (PCR) tests, white cell count, as well evaluating for crystals.

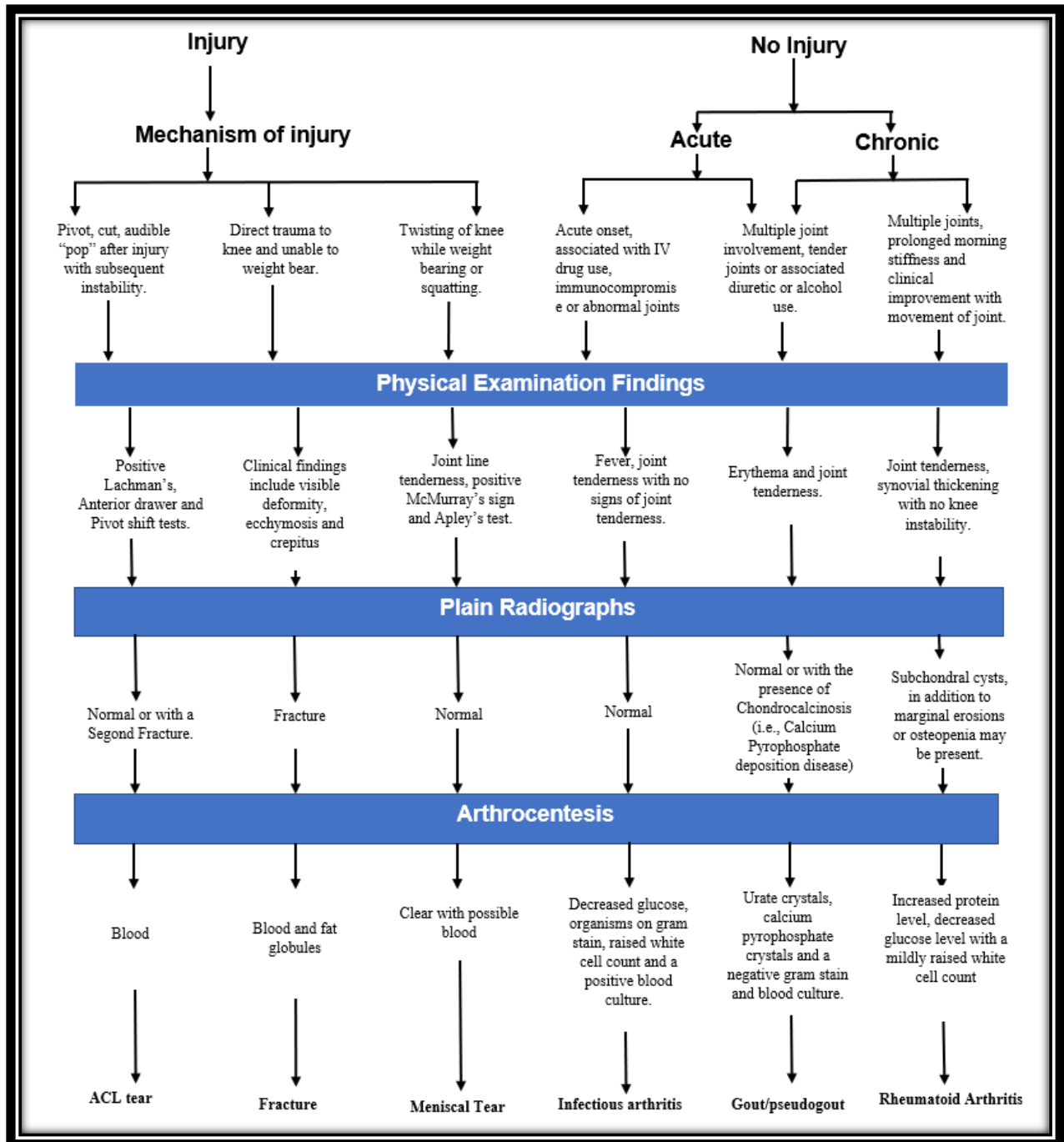
The most common conditions which affect multiple joints at multiple time points are osteoarthritis and inflammatory arthritis. Here, a disease pattern of small joints, extra-articular pathology and specific radiologic features help narrow down the diagnosis.



**Figure 4:** Rheumatoid arthritis of the knee (Source: [MyArthritis](#), CC BY-NC)



**Figure 5:** Osteoarthritis of the knee. Note the characteristic joint space narrowing, formation of osteophytes and increased subchondral density. (Source: [James Heilman](#), CC BY-SA)



**Figure 6:** An approach one can employ when assessing a swollen knee in clinical practice

## References and further reading

- Radswiki, T. & Yap, J. Anterior cruciate ligament tear. Reference article, Radiopaedia.org. (Accessed on 14 Sep 2022) <https://doi.org/10.53347/rID-12490>
- Musahl, V. & Karlsson, J. Anterior cruciate ligament tear. *New England Journal of Medicine*, 380:2341.
- Johnson, M.W. (2000). (2000). Acute knee effusions: A systematic approach to diagnosis. *Am Fam Physician*. 15(61)(8):2391-400. PMID: 10794580.
- Wang, J. H., Lee J. H., Cho, Y., Shin, J. M. & Lee, B. H. Efficacy of knee joint aspiration in patients with acute ACL injury in the emergency department (2016). *Injury*. 47(8),1744-9. doi: 10.1016/j.injury.2016.05.025. Epub Accessed 2016 May 18. PMID: 27262773.

**Editor:** Michael Held

**Conceptualisation:** Maritz Laubscher & Robert Dunn

**Publishing Manager:** Michelle Willmers

**Cover design:** Adapted from first edition cover design by Carlene Venter

**Proofreading and page layout:** Robyn Brown

## ABOUT THE BOOK

This is the second volume of the *Orthopaedics for Primary Health Care* textbook edited by Michael Held, first published in 2021.

Most patients with orthopaedic pathology in low- and middle-income countries are tested by non-specialists. This book was based on a Delphi consensus study\* with experts from Africa, Europe and North America to identify topics, skills and cases concerning orthopaedic trauma and infection that need to be prioritised in order to provide guidance to these health care workers.

The aim of this book is to be student-centred.

\*Held et al. Topics, Skills, and Cases for an Undergraduate Musculoskeletal Curriculum in Southern Africa: A Consensus from Local and International Experts. JBJS. 2020 Feb 5;102(3):e10.



© The Authors 2025. Licensed under a Creative Commons Attribution (CC BY) 4.0 International Licence.

## DISCLAIMER

Although the authors, editor and publisher of this book have made every effort to ensure that the information provided was correct at press time, they do not assume and hereby disclaim any liability to any party for any loss, damage, or disruption caused by errors or omissions, whether such errors or omissions result from negligence, accident, or any other cause.

This textbook is not intended as a substitute for the medical advice of physicians.

The information in this book is meant to supplement, not replace, orthopaedic primary care training.

The authors, editor and publisher advise readers to take full responsibility for their safety and know their limits. Before practicing the skills described in this book, be sure that your equipment is well maintained, and do not take risks beyond your experience, aptitude, training or comfort level.

The individual authors of each chapter are responsible for consent and rights to use and publish images in this book.

## ACKNOWLEDGEMENTS

Thanks to the Orthopaedic Department in the Faculty of Health Sciences and the Centre for Innovation in Learning and Teaching in the Centre for Higher Education Development at the University of Cape Town for the support received in the development of this publication.