



**CENTRE
ORTHOPÉDIQUE
SANTY**

FIFA medical centre of excellence



ACL & HTO

From theory to practice

JM FAYARD

*Centre Orthopédique Santy
Lyon, France*



INDICATIONS



ACL & MEDIAL OSTEOARTHRITIS

Patients

- ACL tear
- Medial OA



Moderate
IKDC B or C



ACL & MEDIAL OSTEOARTHRITIS

Patients

- ACL deficiency
- Medial OA



Varus
deformity



ACL & MEDIAL OSTEOARTHRITIS

Knee Surg Sports Traumatol Arthrosc. 1996;4(1):32-8.

High tibial osteotomy alone or combined with ligament reconstruction
in anterior cruciate ligament-deficient knees. Lattermann C1, Jakob RP.



Main symptoms
should be analyzed

Pain?



HTO

ACL & MEDIAL OSTEOARTHRITIS

Knee Surg Sports Traumatol Arthrosc. 1996;4(1):32-8.

High tibial osteotomy alone or combined with ligament reconstruction
in anterior cruciate ligament-deficient knees. Lattermann C1, Jakob RP.



Main symptoms
should be analyzed

Instability?

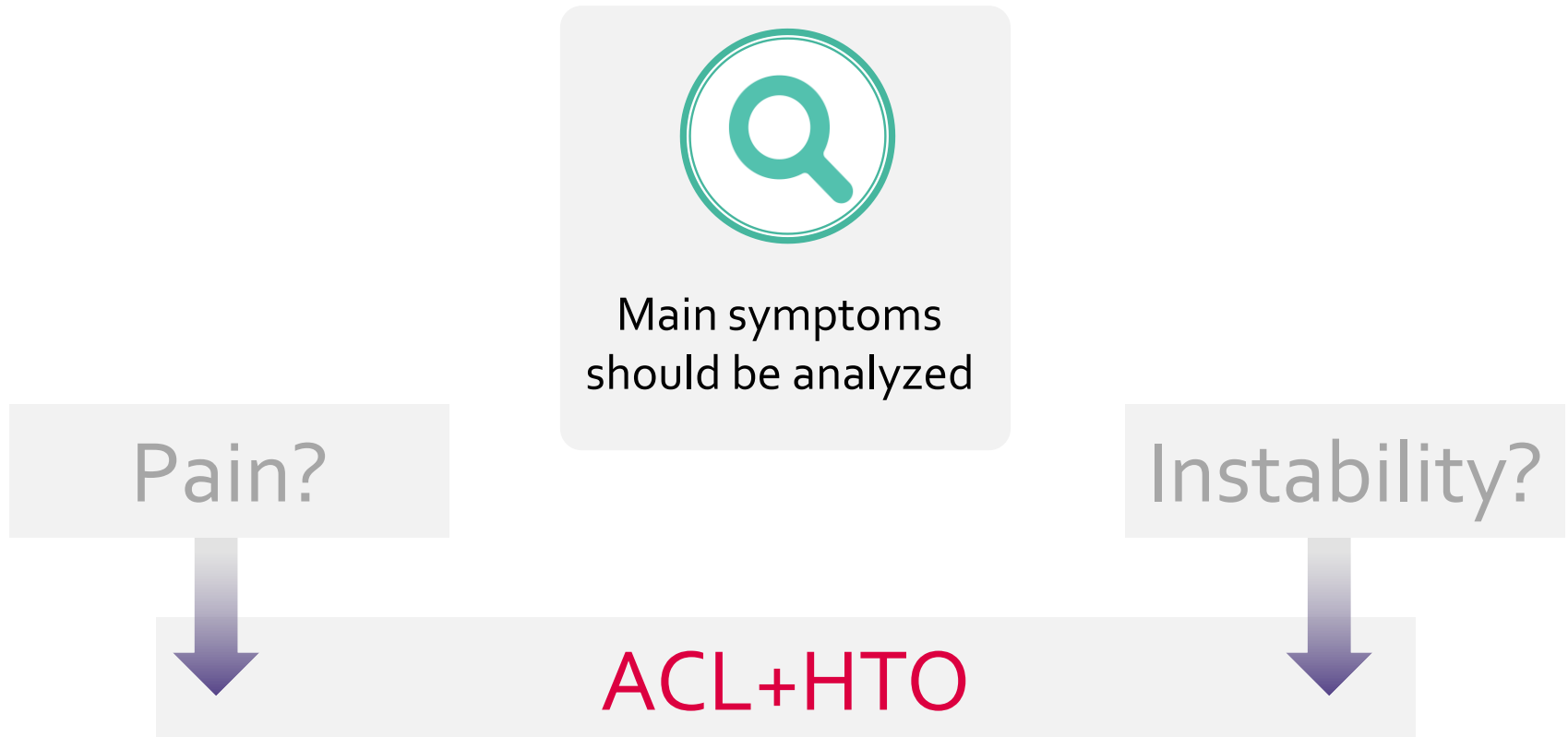


ACL

ACL & MEDIAL OSTEOARTHRITIS

Knee Surg Sports Traumatol Arthrosc. 1996;4(1):32-8.

High tibial osteotomy alone or combined with ligament reconstruction in anterior cruciate ligament-deficient knees. Lattermann C1, Jakob RP.



ACL & MEDIAL OSTEOARTHRITIS

Restore Stability & Painfree Knee

Anterior cruciate reconstruction combined with valgus upper tibial osteotomy: 12 years follow-up

(N. Bonin, T. Ait Si Selmi, S.T. Donell, H. Dejour, P. Neyret / Centre Ivet, Lyon, France
The Knee 11 (2004) 431-437)

12 years FU:

17% arthritic changes

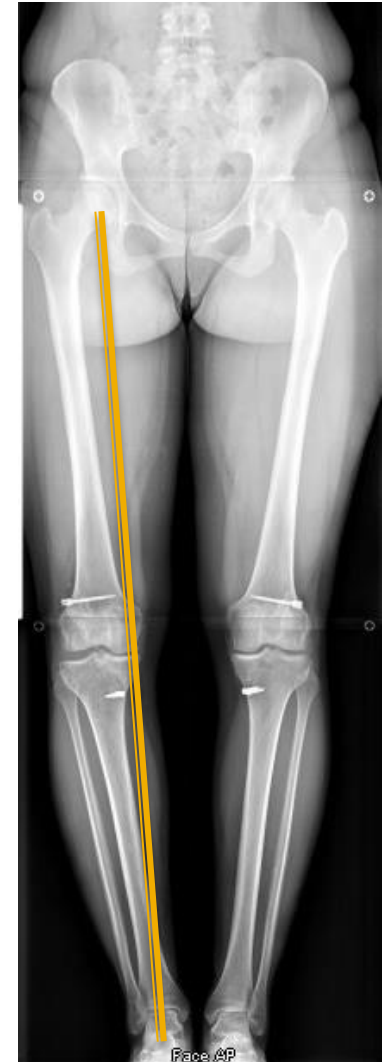
84% sport (47% intensive)

ACL & CHRONIC PCL TEARS



ACL instability

Chronic PLC tear



ACL & CHRONIC PCL TEARS



ACL instability

Chronic PLC tear

« *HTO IS THE
KEY POINT* »

TRILLAT





CORRECTION



BIOMECHANICAL EFFECTS

The Effects of Valgus Medial Opening Wedge High Tibial Osteotomy on Articular Cartilage Pressure of the Knee: A Biomechanical Study

Jens Dominik Agneskirchner, M.D., Christof Hurschler, Ph.D., Christiane D. Wrann, D.V.M.,
and Philipp Lobenhoffer, M.D.

Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 23, No 8 (August), 2007: pp 852-861

- | | |
|---------------------------|--|
| • Normocorrection: | Unloads medial compartment (2.4 MPa vs 1.7 MPa) |
| • Hypercorrection: | Overloads lateral compartment (1.6 vs 2.2 Mpa) |
| • MCL | Release decreases contact stress pressure on the medial compartment (1.3 vs 0.6 Mpa) |

GOALS

Proximal tibial osteotomy for osteoarthritis with varus deformity

Proximal Tibial Osteotomy for Osteoarthritis with Varus Deformity

A TEN TO THIRTEEN-YEAR FOLLOW-UP STUDY*

BY PH. HERNIGOU, M.D.[†], D. MEDEVIELLE, M.D.[†], J. DEBEYRE, M.D.[†], AND D. GOUTALLIER, M.D.[†], CRETEIL, FRANCE

From the Department of Orthopaedic Surgery, Centre Hospitalo-Universitaire Henri Mondor, Creteil

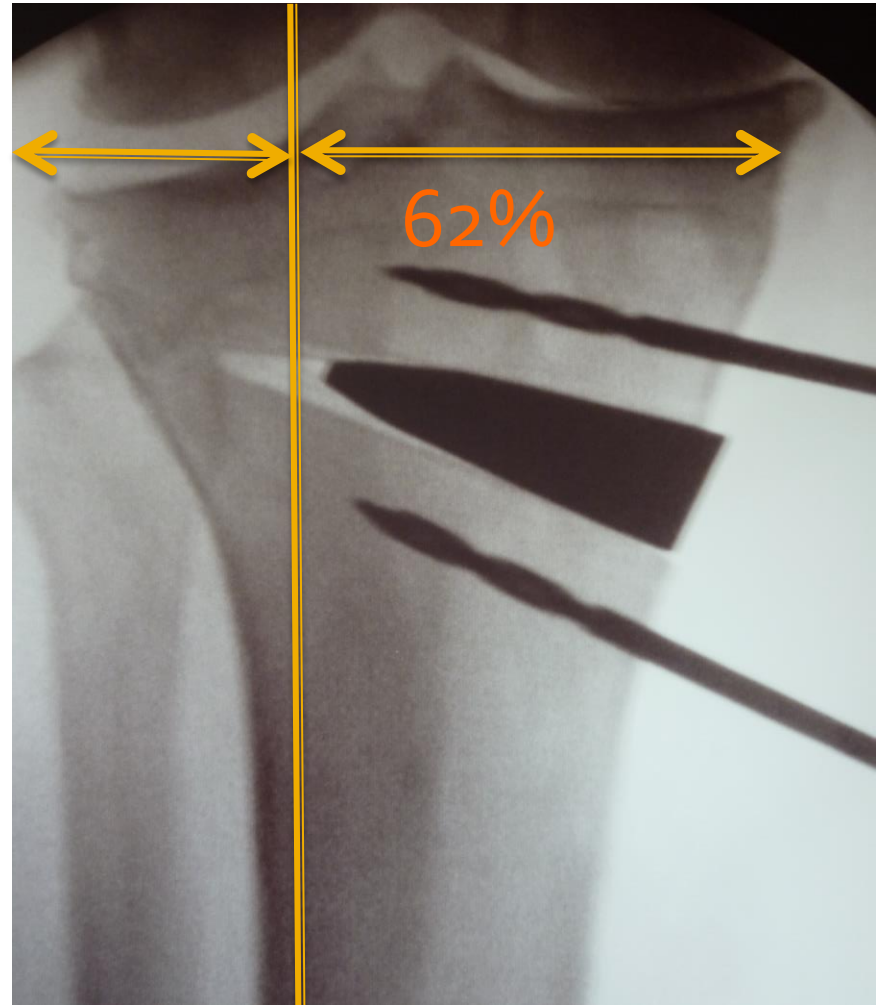
- **Slight overcorrection**
- **>6° valgus:** Risk of overloading of the lateral compartment

GOALS

■ MEDIAL OA

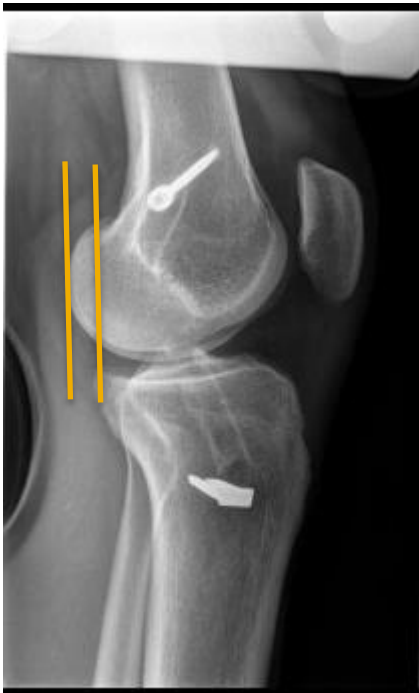
- 3 to 5° valgus
- Mechanical FT axis lateral to the tibial spine (30%)

Consider age,
sports level & grade
of OA



GOALS

- PLC tears



GOALS

- PLC tears
 - Normocorection
 - MFT Axis between spines





TECHNICAL CONSIDERATION



NEWCLIP-TECHNICS

INNOVATION MEANS MOTION

PITFALLS

→ Opening wedge

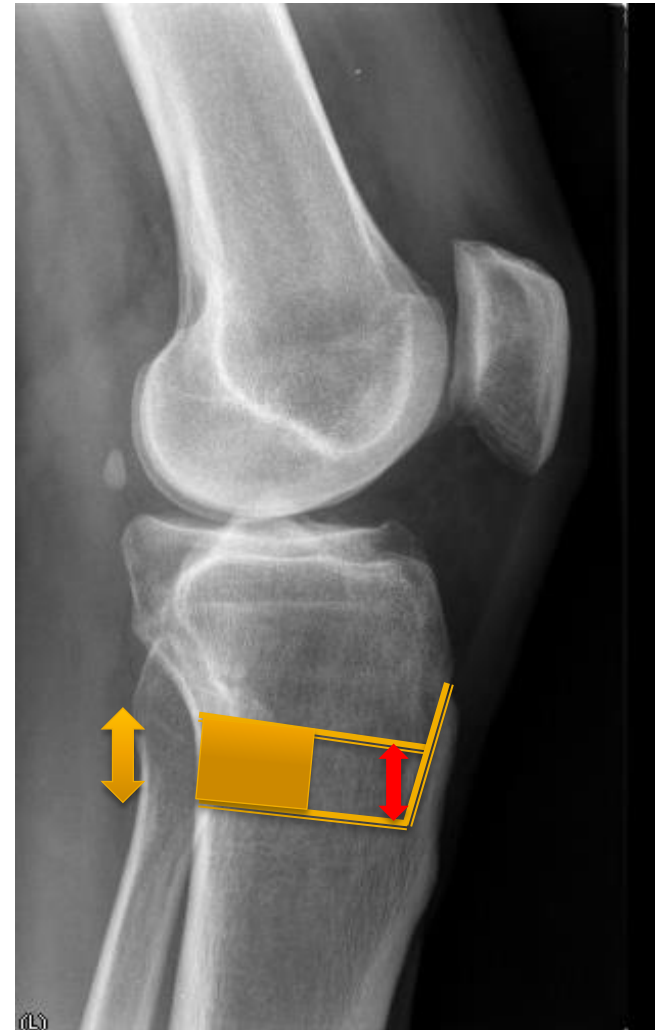


Tibial slope

■ KNEE

The influence of the tibial slope and the size of the intercondylar notch on rupture of the anterior cruciate ligament

B. Sonnery-Cottet,
P. Archbold,
T. Cucurulo,
J.-M. Fayard,
J. Bortolletto,
M. Thaumat,
T. Prost,
P. Chambat



Influence of Anthropometric and Mechanical Variations on Functional Instability in the ACL-Deficient Knee

WEN LIU¹ and MURRAY E. MAITLAND²

¹Department of Physical Therapy Education, The University of Kansas Medical Center, Kansas City, Kansas
and ²School of Physical Therapy, University of South Florida, Tampa, Florida

↗ Tibial slope: ↗ anterior tibial drawing

Slope 4°: 9mm

Slope 12°: 15 mm

TIBIAL SLOPE & ACL

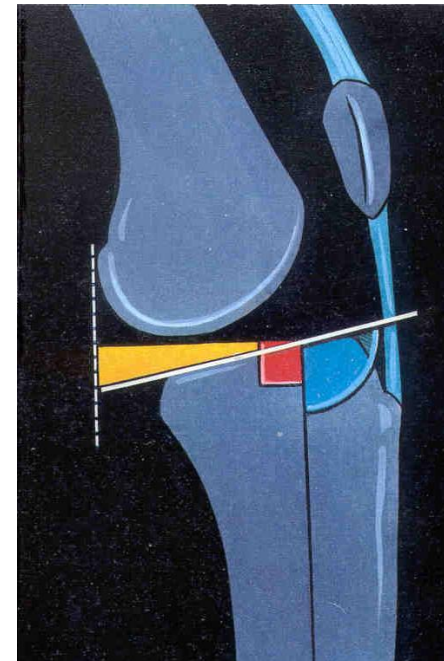
Knee Surg Sports Traumatol Arthrosc (2013) 21:134–145
DOI 10.1007/s00167-012-1941-6

KNEE

The role of the tibial slope in sustaining and treating anterior cruciate ligament injuries

Matthias J. Feucht · Craig S. Mauro ·
Peter U. Brucker · Andreas B. Imhoff ·
Stefan Hinterwimmer

Tibial slope influences
anterior laxity and
constrains through ACL



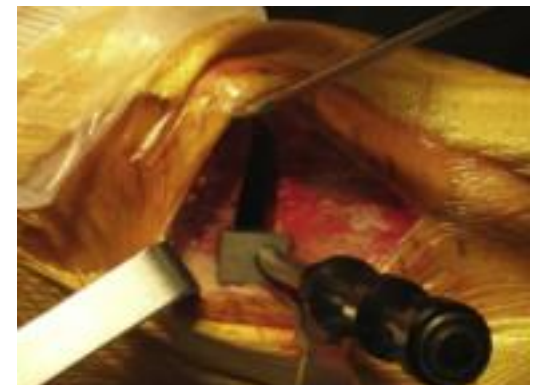
H.T.O. & SLOPE

Posterior tibial slope changes after opening- and closing-wedge high tibial osteotomy: A comparative prospective multicenter study

A. Ducat^{a,*}, E. Sariali^a, B. Lebel^b, P. Mertl^c, P. Hernigou^d, X. Flecher^e,
R. Zayni^f, M. Bonnin^f, R. Jalil^d, J. Amzallag^{a,g}, P. Rosset^h, E. Servienⁱ,
F. Gaudot^j, T. Judet^j, Y. Catonné^a

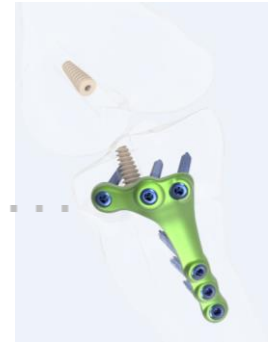
Orthopaedics & Traumatology: Surgery & Research (2012) 98, 68–74

Opening wedge ↗ slope of 0,6°

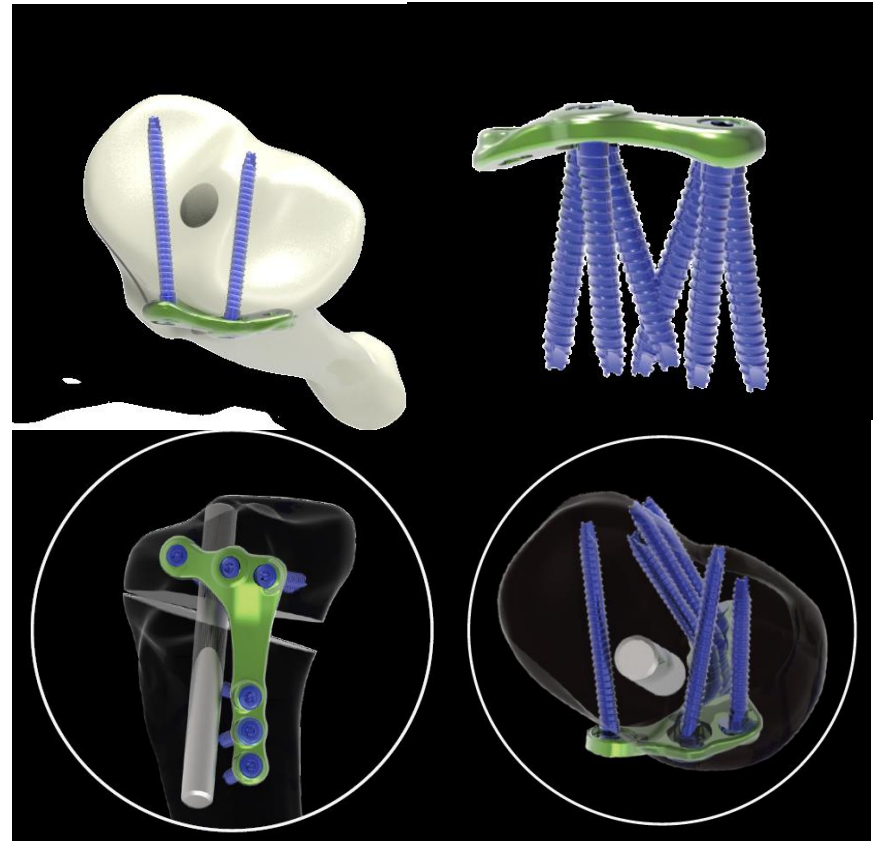


PITFALLS

➡ Opening wedge



**Impigement
screws/tunnel**





PARTICULAR CASES

ACL & LATERAL O.A.



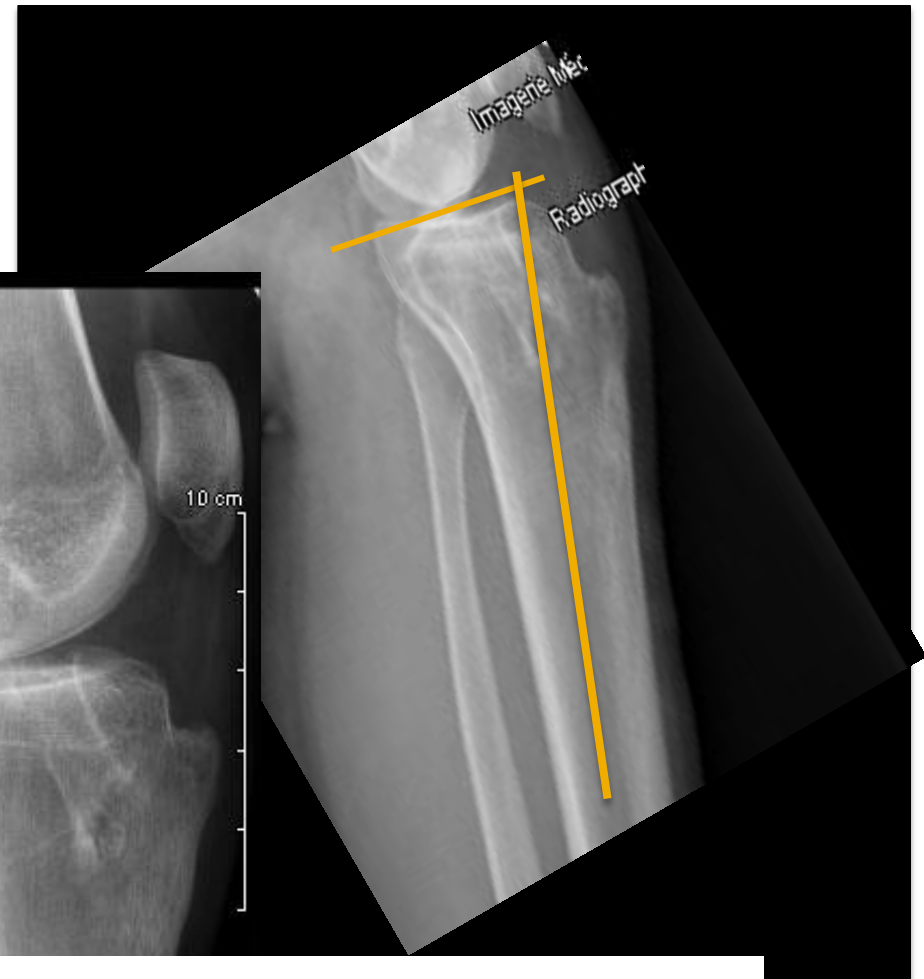
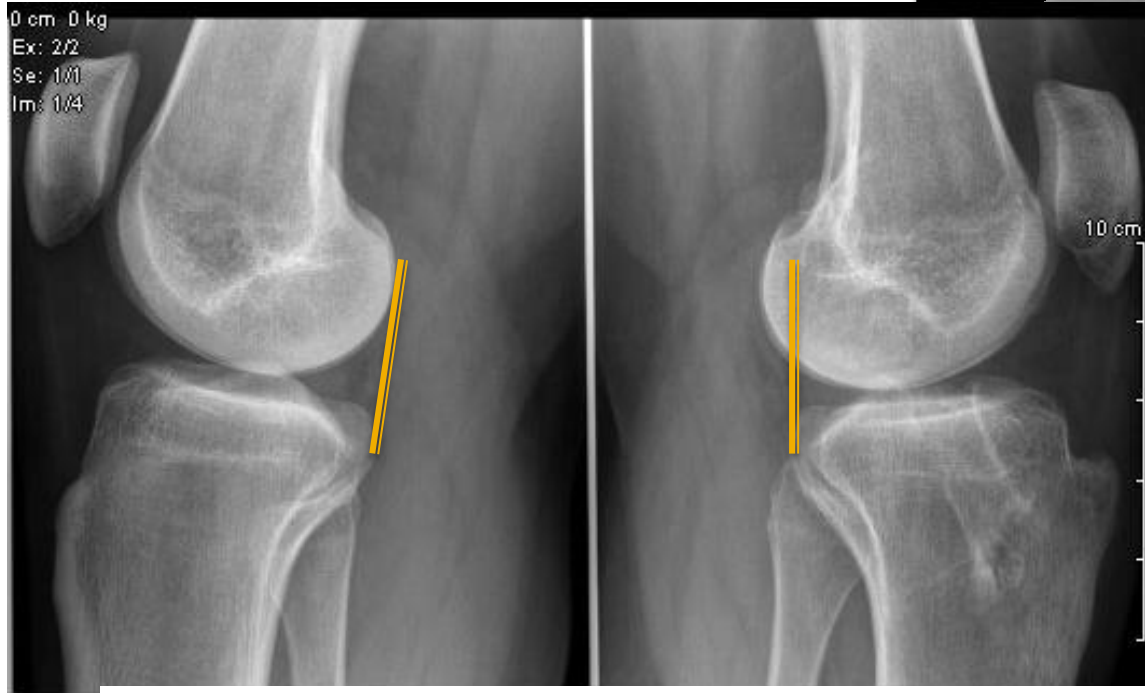
ACL & LATERAL O.A.

ACL + Varus HTO



EXCESSIVE TIBIAL SLOPE

THIRD ACL TEARS



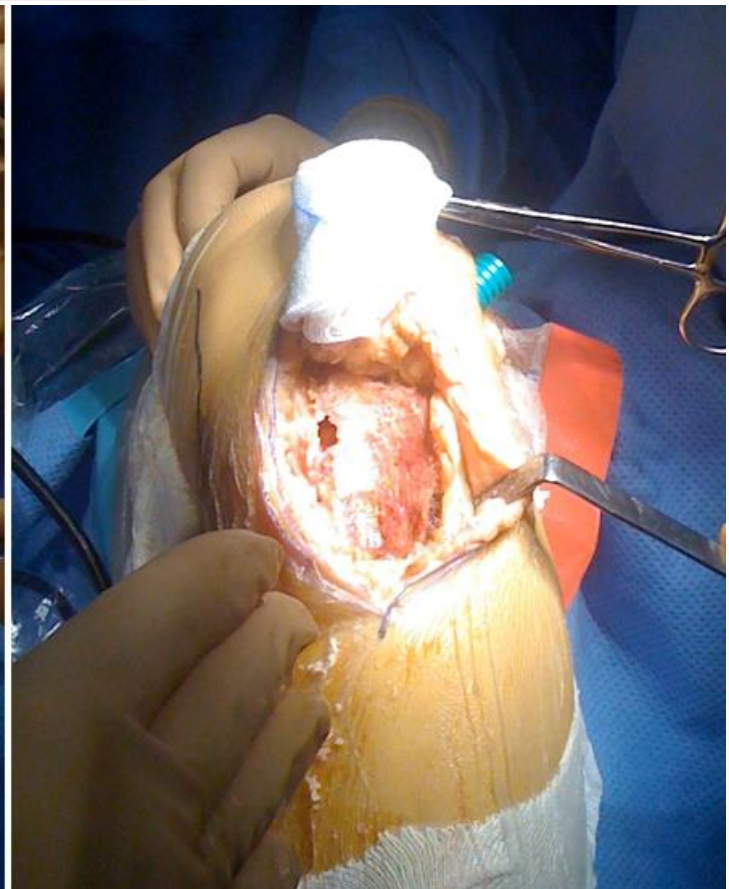
Am J Sports Med. 2014 May 28;42(8):1873-1880. [Epub ahead of print]

Proximal Tibial Anterior Closing Wedge Osteotomy in Repeat Revision of Anterior Cruciate Ligament Reconstruction.

Sonnery-Cottet B¹, Mogos S², Thaumat M², Archbold P³, Fayard JM², Freychet B², Clechet J², Chambat P².

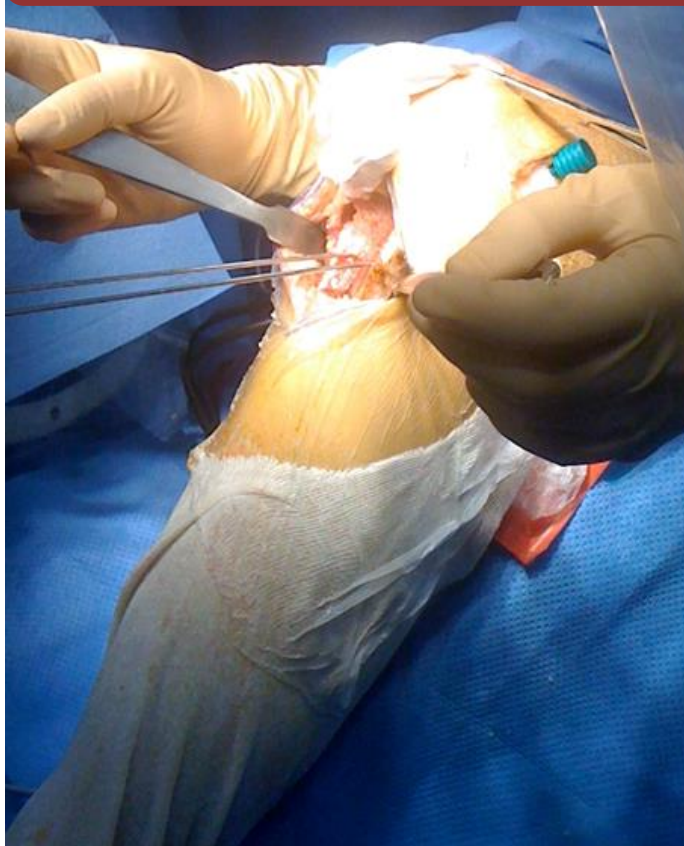
EXCESSIVE TIBIAL SLOPE

Anterior closing wedge HTO + ACL



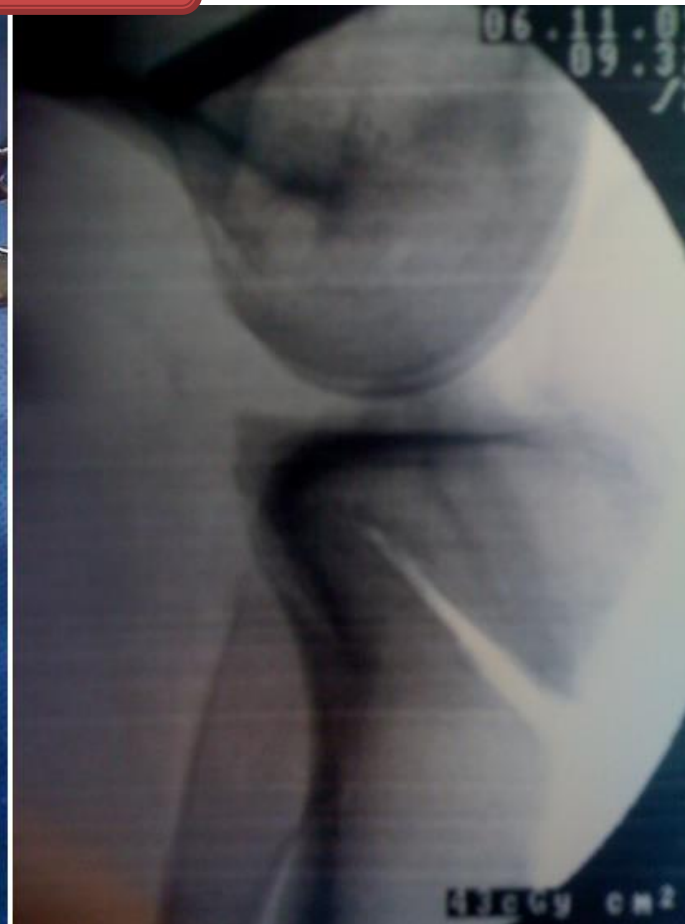
EXCESSIVE TIBIAL SLOPE

ACW HTO + ACL



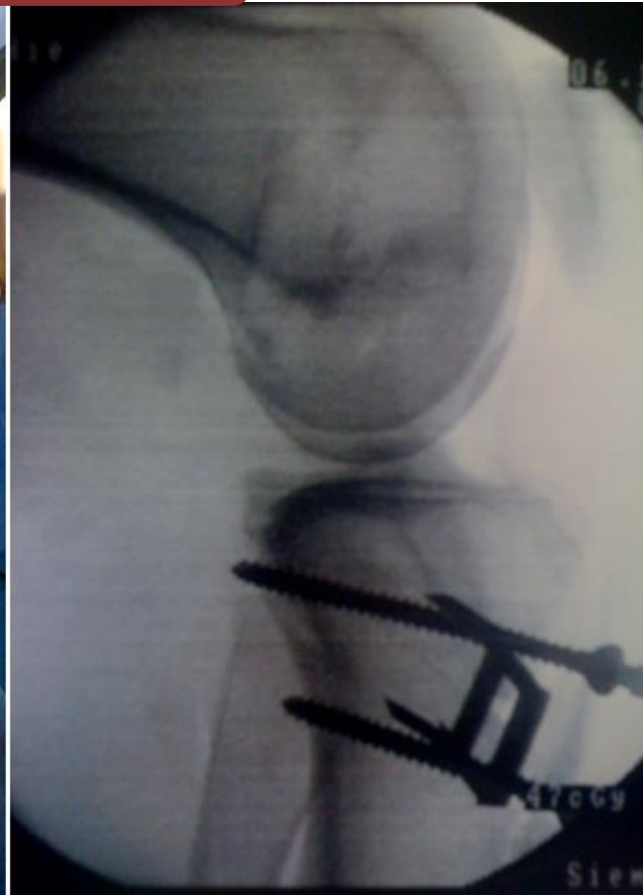
EXCESSIVE TIBIAL SLOPE

ACW HTO + ACL



EXCESSIVE TIBIAL SLOPE

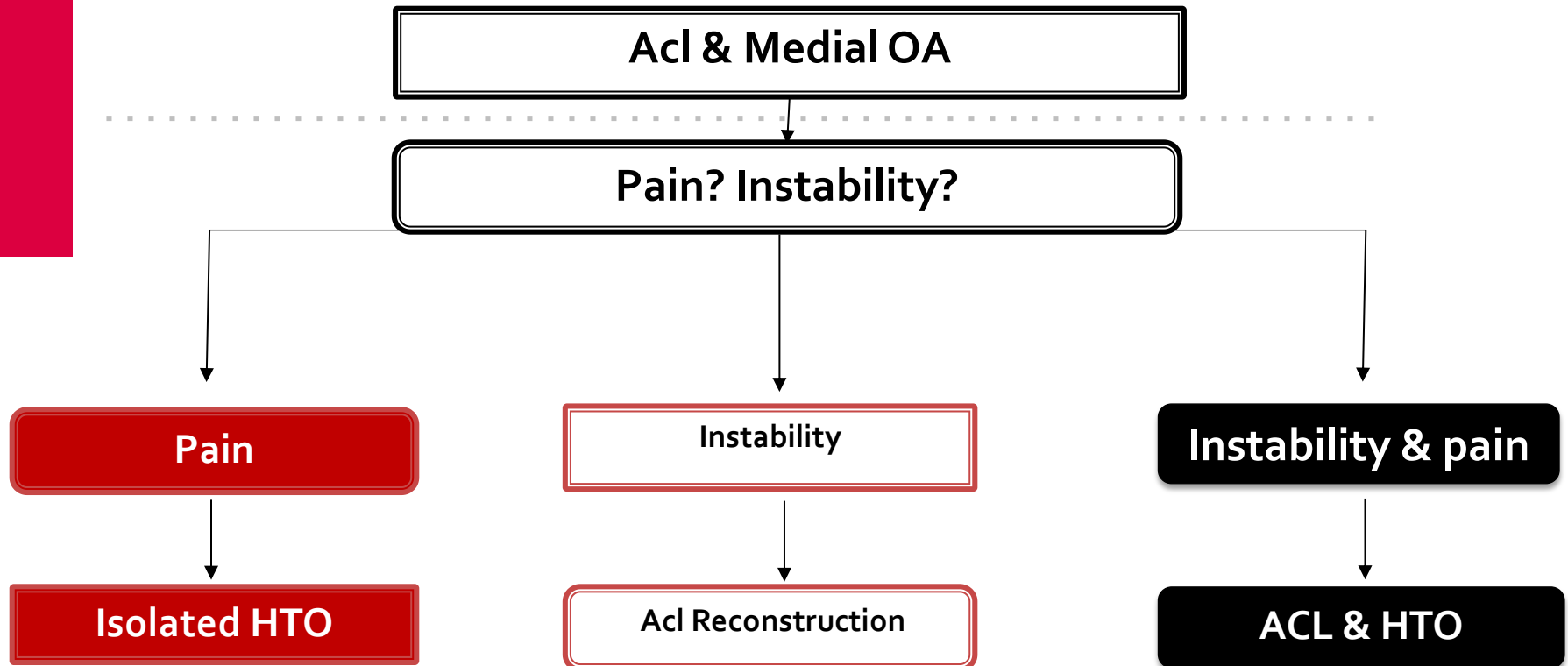
ACW HTO + ACL



EXCESSIVE TIBIAL SLOPE



CONCLUSION



Consider:
Age
Sport level
Grade of OA

CONCLUSION

