



# Second fractures , Diagnosis and treatment

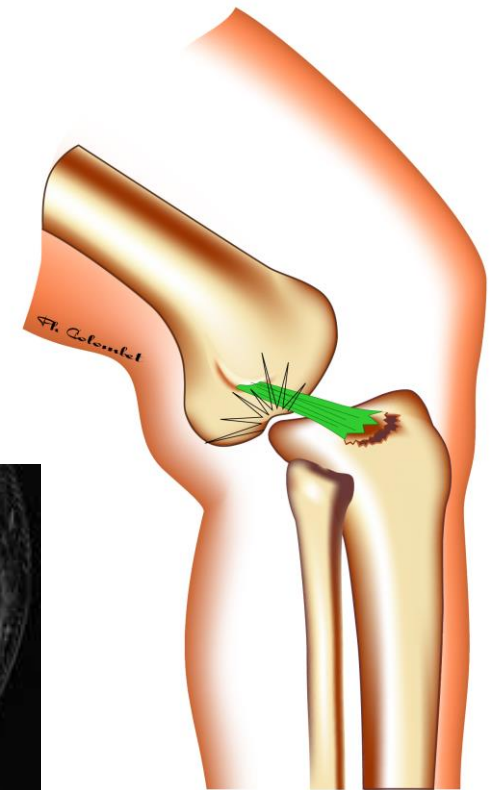
Burt Klos

ICONE

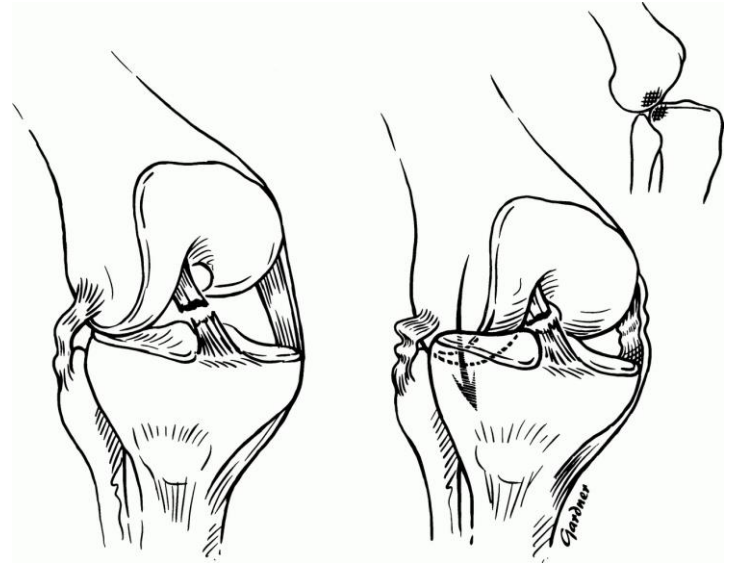
The Netherlands



# Primary injury / plain X ray information



# Segond fractuur

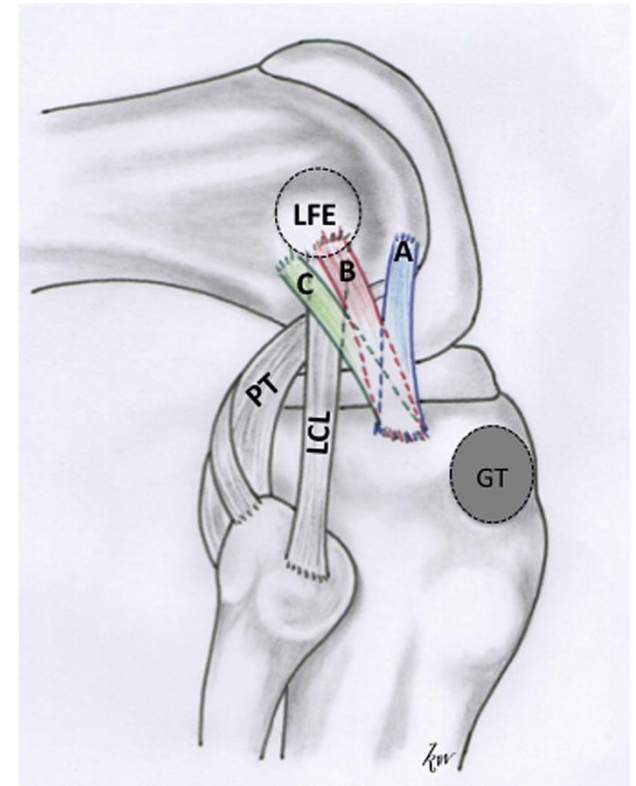
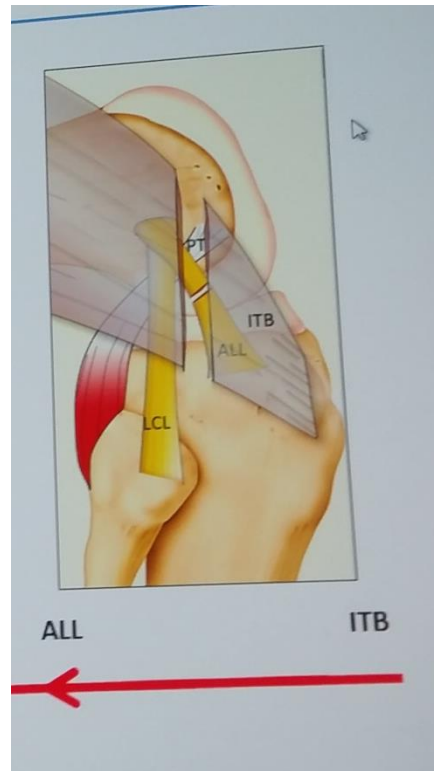
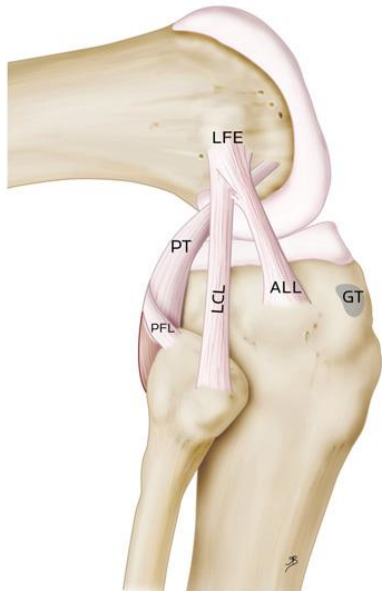
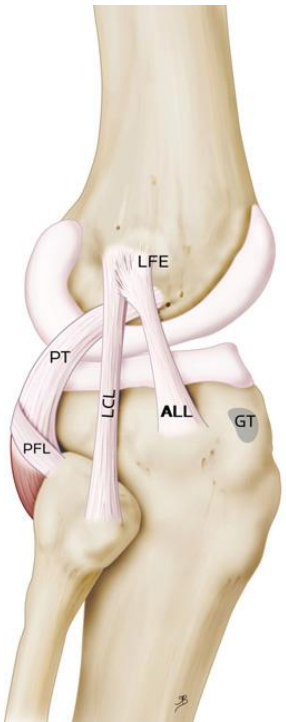


# ALL anatomy 2016

Belgium

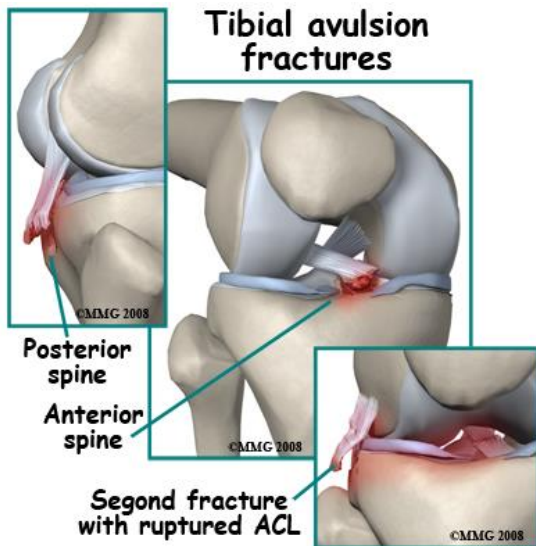
Lyon

Toulouse



# Hypothesis

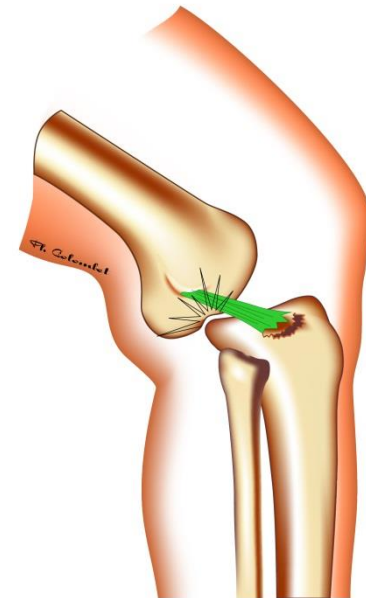
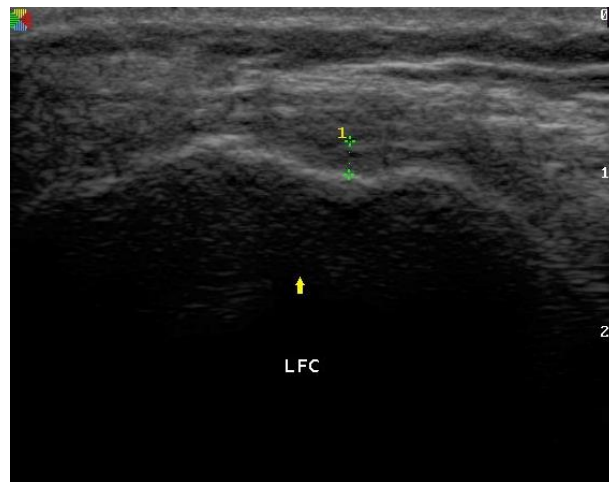
- Avulsion lesions are a possible goal for refixing important lateral structures.
- The same approach we have for lateral fibula and tibial spine avulsion fractures





# Ultrasound imaging

- 88 patients with ACL #
- 25 Segond lesions
- 70 Impaction # lateral FC

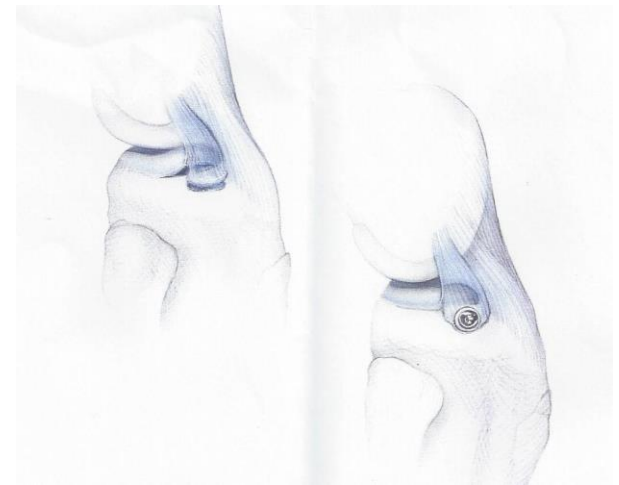


# US ALL ligament and #



# Imaging Segond avulsion

- Incidence in MRI 3 % Resnick USA 6 % AUS
- Incidence in X ray CORR Hess D 9 %
- Incidence ultrasound 28 % (ICONE)
- Higher velocity trauma ?
- Refixation / Feagin :






# Laxity check



TEST 90° - DRAWER  
REFERENCE POSITION



ACL  
Surgeries

P T F  
1 2 C

DR24 - Drawn

PRE-OP. LAXITIES

- DRAWER
- ROTATION 90°
- LACHMAN
- ROTATION 30°
- VAR-VALG. STABILITY
- PIVOT-SHIFT
- PRE-OP. SUMMARY

FLEXION: 89°      ROTATION: 15° INT

Place the leg in the reference position for the drawer test (90°), without any drawer.

PRAXIM

# Rotation



**TEST 90° - ROTATION ACQUISITION**

Lateral (mm)

Ant 0 4 Post 4

Ext 13 13

Axial rotation (°)

Medial (mm)

Ant 2 3 Post 0 2

5 POSITIONS (MIN 10 - MAX 500)  
FLEXION: 82° ROTATION: 10° EXT

Perform the rotation test at 90°.  
BLUE pedal to stop the acquisition.

ACL Surgeries

P T F  
1 2 C

PRE-OP. LAXITIES

DRAWER

**ROTATION 90°**

LACHMAN

ROTATION 30°

VAR.-VALG. STABILITY

PIVOT-SHIFT

PRE-OP. SUMMARY

PRAXIM

# Peroperative imaging lift off lateral meniscus

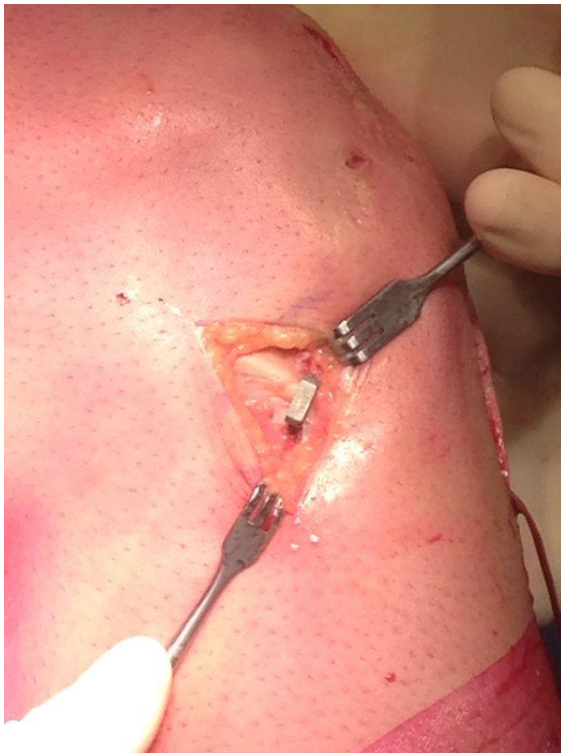


# Data

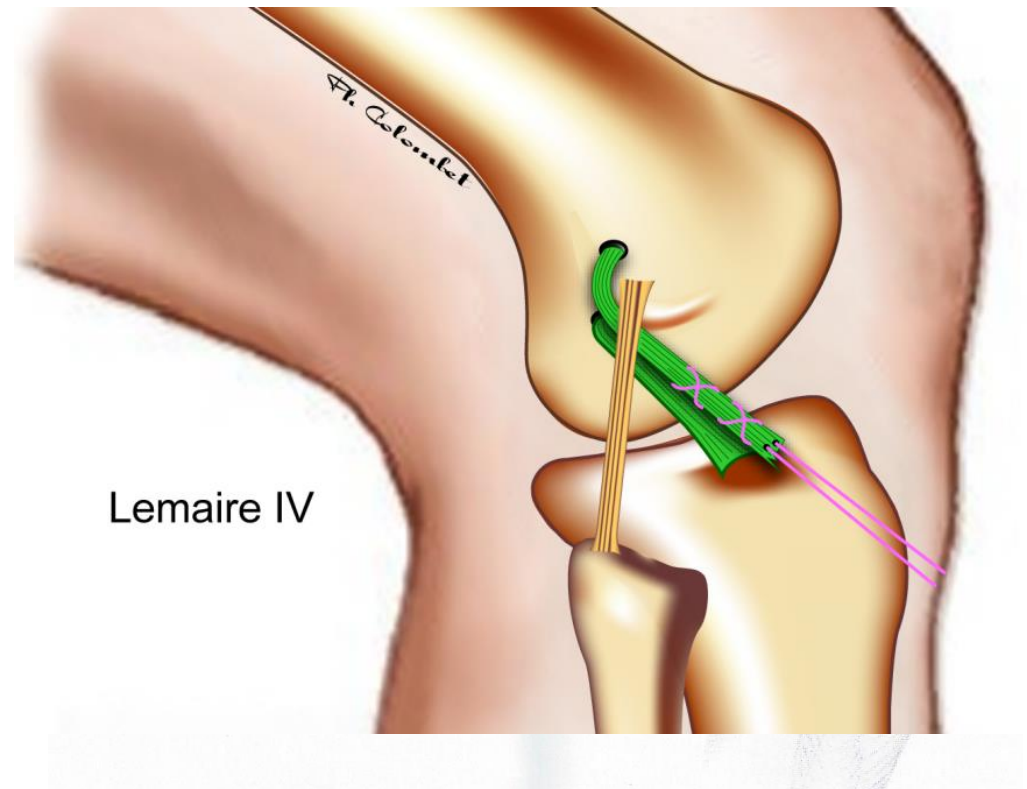
- 18 patients / knees .
- Second fracture with intra operative signs of displacement .
- Preoperative marking # on the skin .
- Staple fixation .
- 5 cases with navigation .



# Case Report : Refixing ALL / Second # Checking the pivot on the table is pulling the staple off / prove of importance in stability ?



# Refixing Segond or reconstruction AL complex ?





# Conclusion

- Validation study
- Importance of diagnosis (5>9>28 % )
- Ultrasound imaging ( increases 5x incidence )
- Distal avulsion lesions refixation in stead of reconstruction ?
- Clinical outcome ?