



Universitat Autònoma de Barcelona

# Controversy in MPFL technique

## *Limits of the MPFL Reconstruction*



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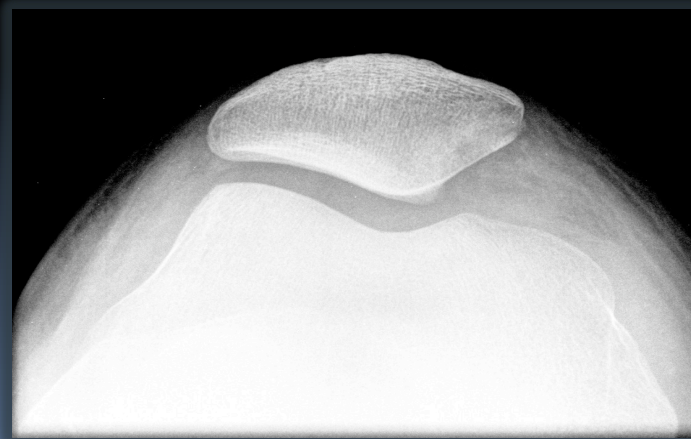
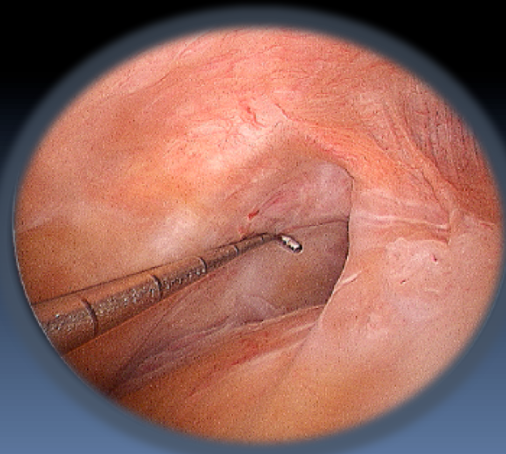
Spain

# Disclosures

- Consulting with ConMed-Linvatec
- Consulting with Surgival
- Editorial Committee of *Arthroscopy*
- Educational Committee of ISAKOS
- Arthroscopy Committee of ESSKA
- I, nor any family members, do not have any conflict of interest related to this presentation

# PF Stability

- The stability of the patella during motion is controlled by:
  - **soft tissue** →  $< 30^\circ$  (initial knee flexion)
  - **bone anatomy** → after  $30^\circ$



# Pathoanatomy of Lateral PF Instability

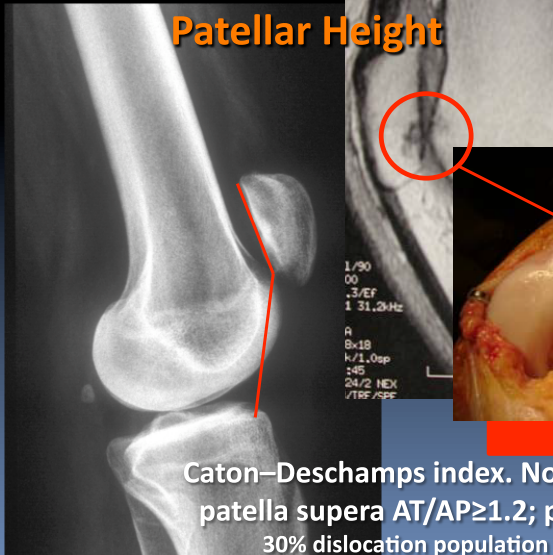
All patients with recurrent patellar dislocation have MPFL damage

## Patellar Tilt



Soft tissue imbalance (Lateral tightness / Medial Laxity)  
83% dislocation population / control 3%  
(p=0.001)

## Patellar Height



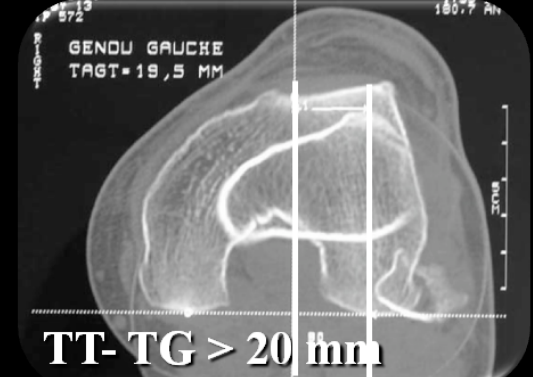
Caton-Deschamps index. Normal value for AT/AP=1;  
patella supra AT/AP $\geq$ 1.2; patella infra AT/AP $\leq$ 0.6  
30% dislocation population / control 0% (p=0.001)



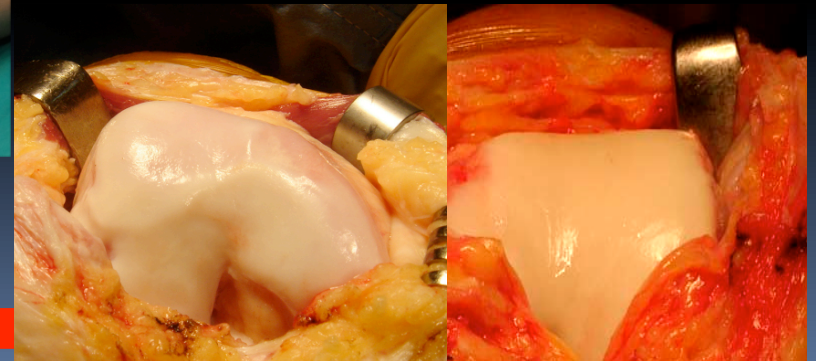
# Lateral Instability

## TT – TG Distance

Assess rotational alignment of the extensor mechanism



Increases lateral quadriceps vector 56%  
>20mm dislocation population / control 12mm (p=.003)



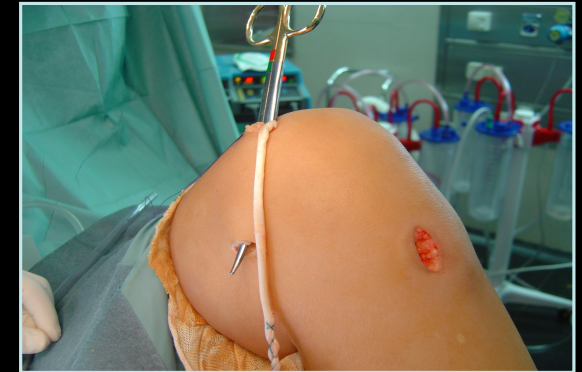
## Trochlear Dysplasia

96% dislocation population / control 3% (p=0.001)

# Factors contributing to instability

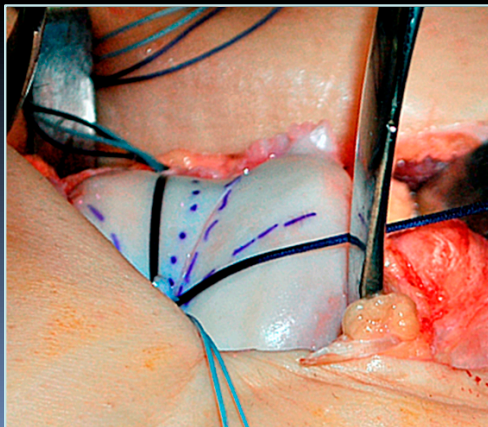
- inadequate **medial soft-tissue restraints**
  - such as VMO weakness or MPFL disruption
- inadequate **bony restraints**
  - such as patella alta and patellofemoral dysplasia
- excessive **laterally-directed forces**
  - lower extremity malalignment (↑ TT-TG or femoral anteversion / external tibial torsion)

# Treatment of Patellar Instability



- Consistent surgical technique

→ remains unclear

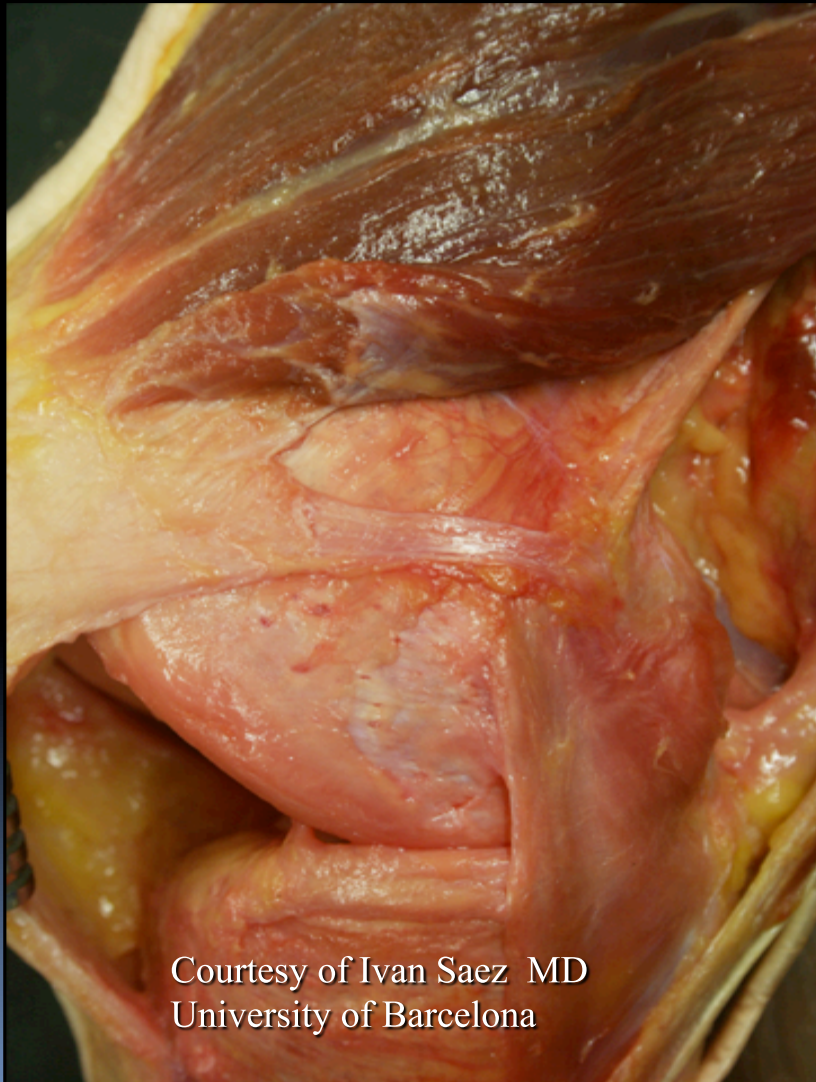


# Treatment of Patellar Instability

- Difficulty in re-establishing the bony constraint of the PF joint has led investigators to focus on the medial soft tissue structures
  - \* predominantly **the MPFL**



# Why the MPFL?



Courtesy of Ivan Saez MD  
University of Barcelona

- The primary soft tissue restraint for lateral patellar subluxation near extension
  - 53-60% of the check-rein to lateral patellar displacement at 0-30° of knee flexion

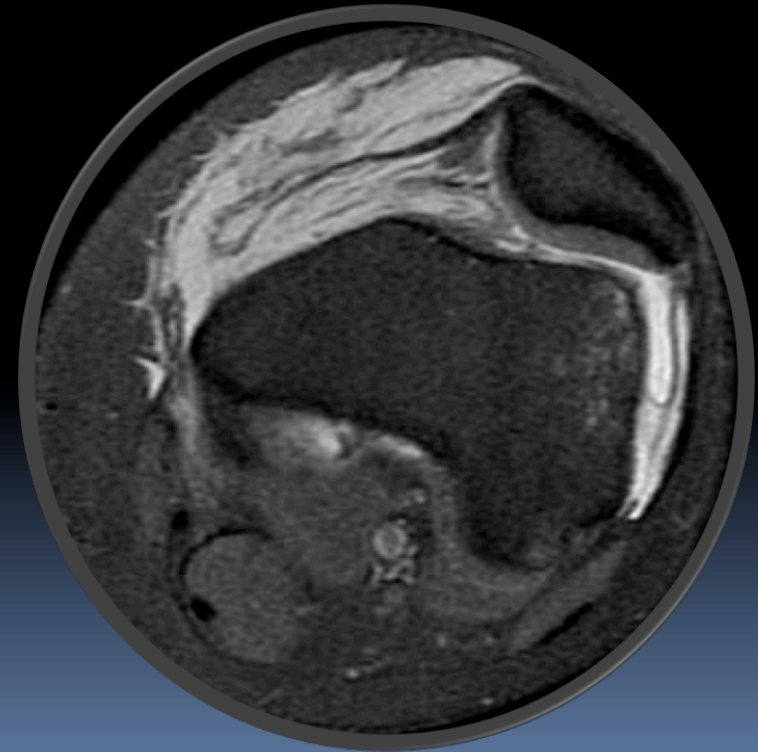
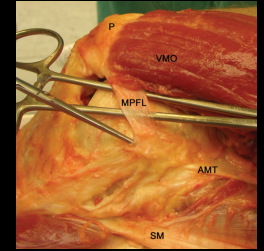
Desio *Am J Sports Med.* 1998

Conlan *J Bone Joint Surg Am.* 1993



# Why the MPFL?

- Often (>90%) disrupted in primary patella dislocations
- Patellar tracking
  - significantly affected **by a lateral force** in the absence of the MPFL
  - returns to normal **following MPFL R**





A systematic review of complications and failures associated with medial patellofemoral ligament reconstruction for recurrent patellar dislocation.  
Shah JN et al. *Am J Sports Med* 2012

## Metaanalysis – Level II

629 knees

MPFL R has a **high rate of success** for patients with PF instability  
The **complication rate** → **26.1%** (164 cases, not trivial)

- \* **Recurrent instability** → **32%** (52/164) of all complications
- Failure due to →
- graft loosening or rupture
  - failure to recognize **additional risk factors**

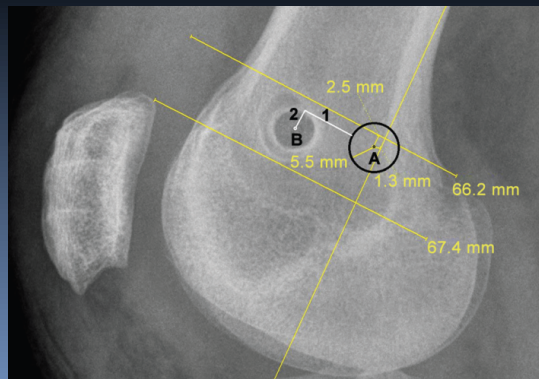
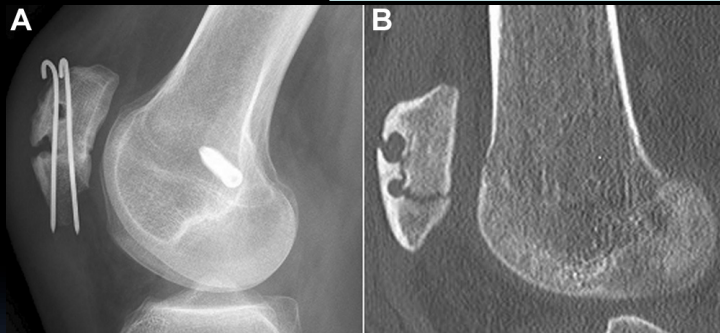


# Complications of Medial Patellofemoral Ligament Reconstruction in Young Patients

Parikh et al. *AJSM* 2013

Case series - Level of evidence IV

- 179 MPFL R
- **Complications** occurred in **16.2%** of MPFL R in young patients
  - Almost half resulting from **technical problems**
  - The rest from **uncorrected additional risk factors**



Most failures in MPFL R  
result from factors that  
surgeons can control

Failure to recognize  
additional risk factors

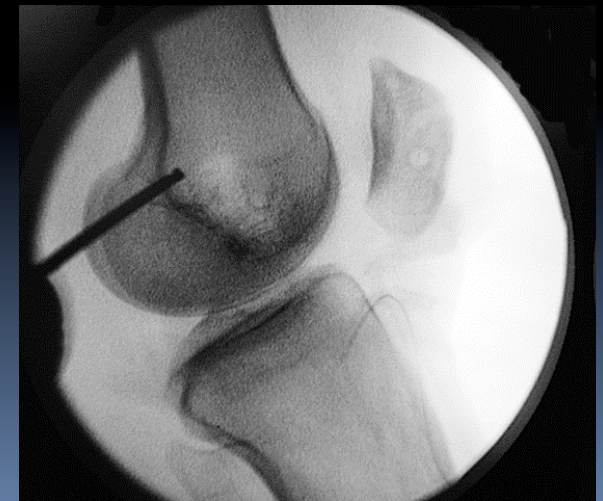
# TECHNICAL ERRORS

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**47% of the complications in MPFL R are related to technical errors**

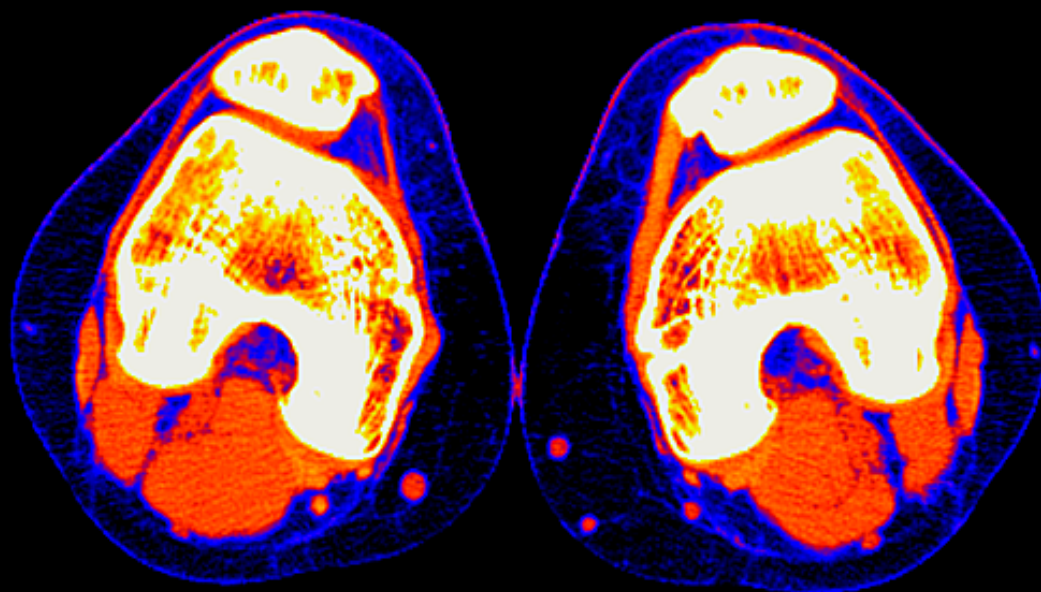
Shital N, et al. *AJSM* 2013

**Prevention –**  
**Surgical precision**



# CASE # 1

## Inappropriate placement of the femoral tunnel

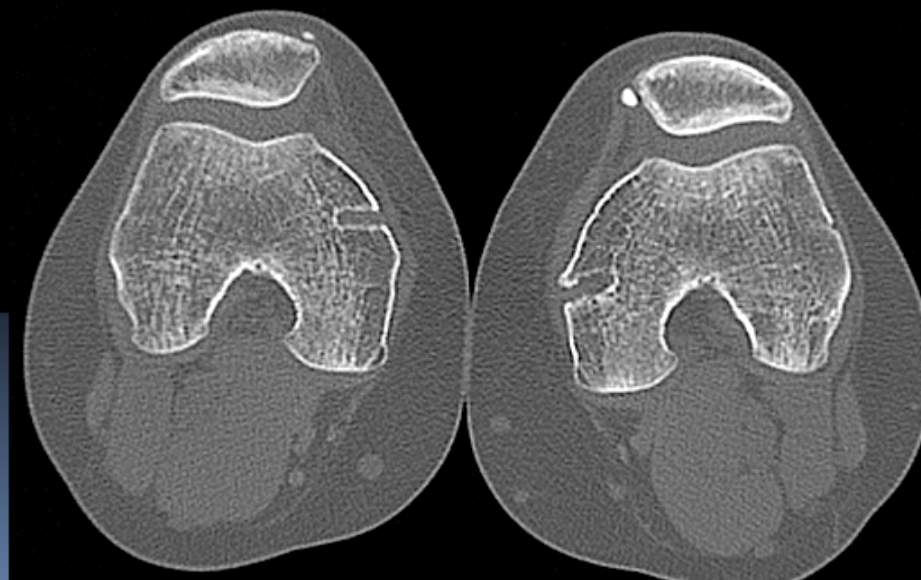


One-bundle partial-thickness quadriceps tendon graft

**Failed Surgery (2 years follow-up) –  
Limitations during sports task-specific (dance) – Revision Surgery**

**ST Double-Bundle**

**Excellent outcome (8 years follow-up) – No limitations during sports task-specific (dance)**



Most failures in MPFL R  
result from factors that  
surgeons can control

Failure to recognize  
additional risk factors

# FAILURE TO TREAT ADDITIONAL RISK FACTORS

## Isolated MPFL R for the wrong indication

- Inadequate bony restraints
- Lower extremity malalignment

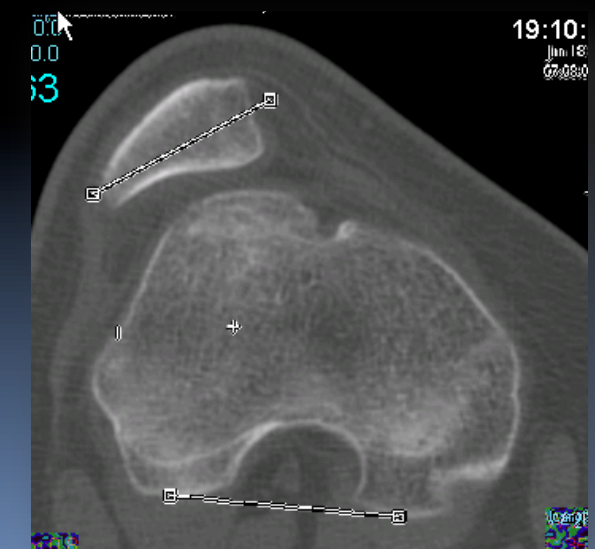
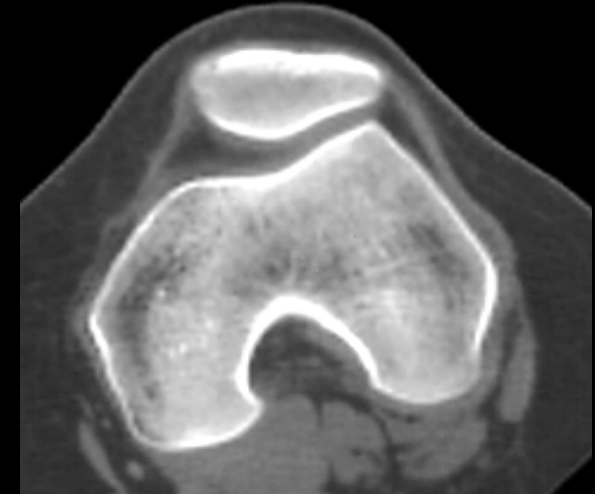
*“Tailored operative therapy”*



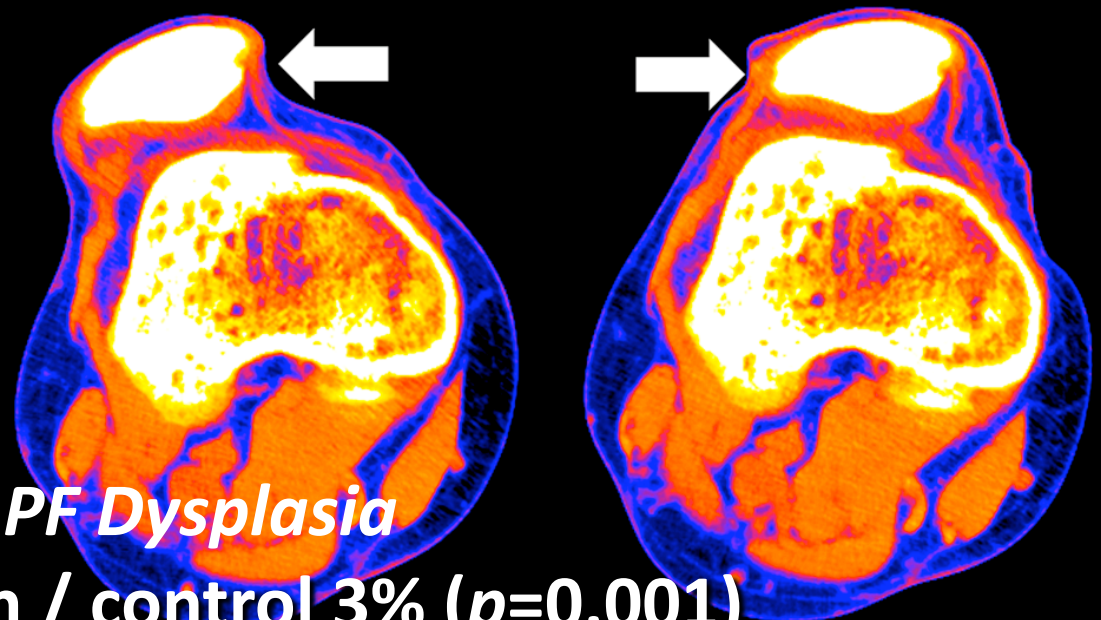
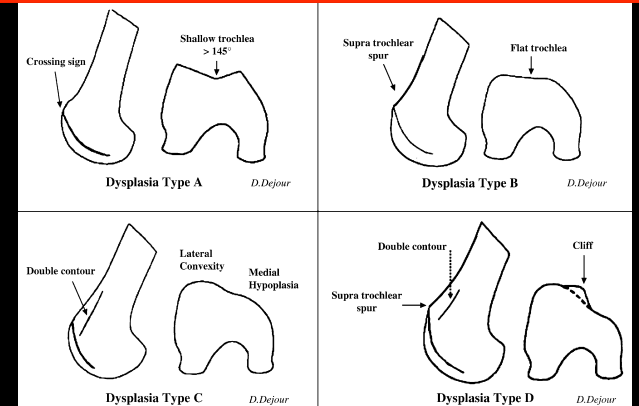


# # 1 Patellofemoral dysplasia

- In a normal knee
  - the contour of the femoral trochlea provides lateral constraint to the patella
- In cases of dysplasia
  - the flattened lateral condyle fails to provide a buttress to lateral patellar subluxation



# # 1 Patellofemoral dysplasia

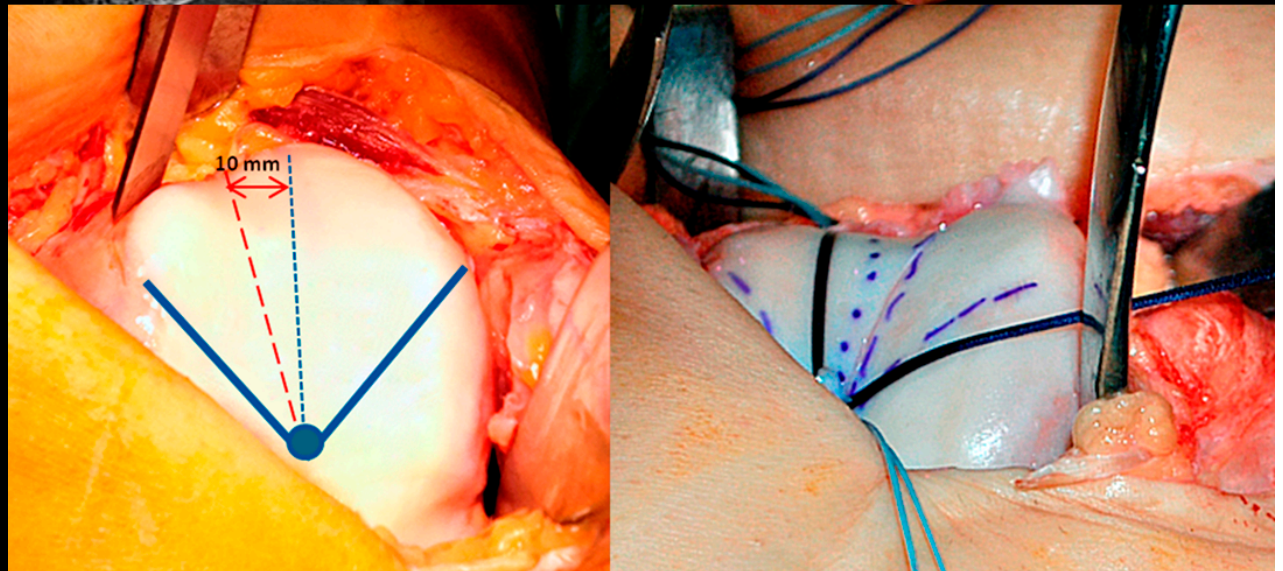
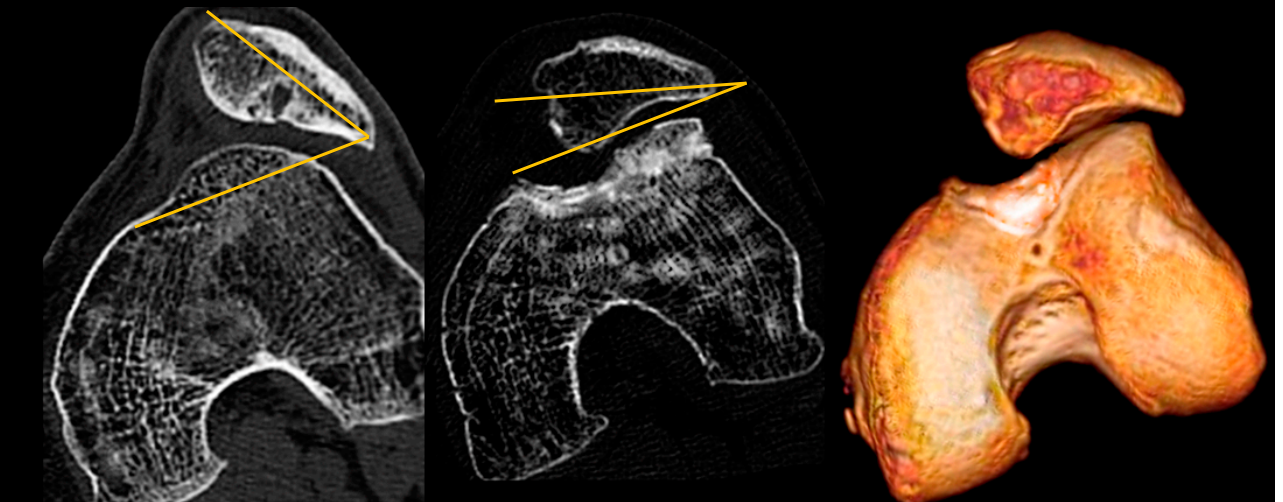


**MPFL R FAILURE in case of PF Dysplasia**  
**96% dislocation population / control 3% ( $p=0.001$ )**

# Throcleoplasty

- **Effective** in recurrent PF instability associated with trochlear dysplasia
- The impact on PF pain and the development of OA → **less predictable**

\*Patient satisfaction **appeared to outweigh** its possible sequelae

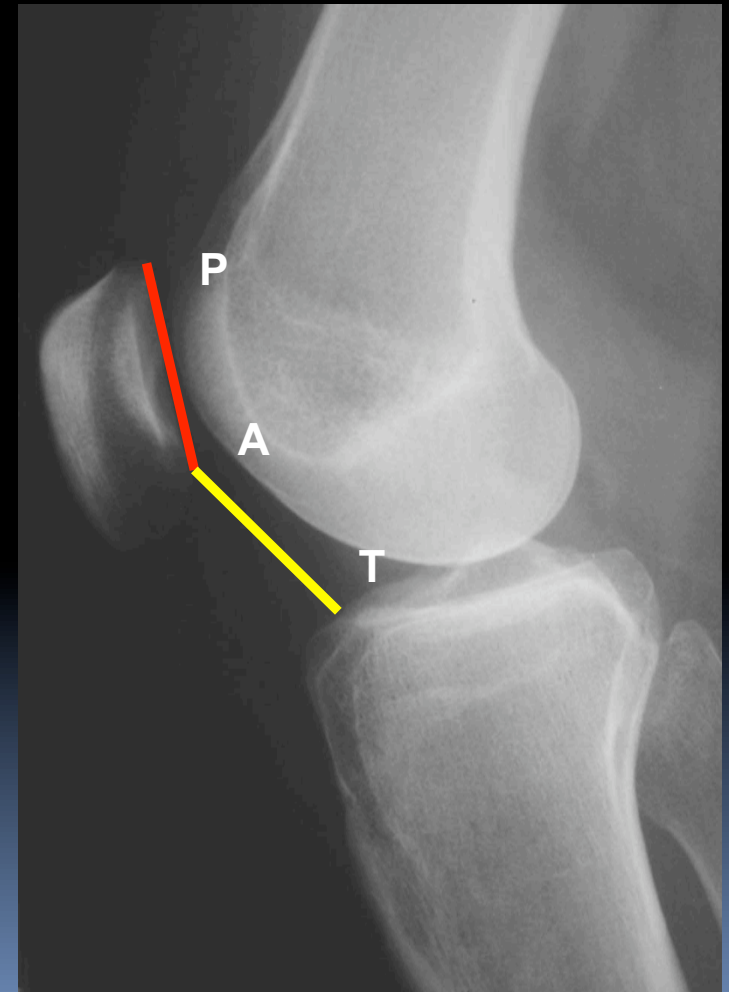


von Knoch. *JBJS Br.* 2006  
Fucentese SF. *KSSTA.* 2011  
Dejour. *Int Orthop.* 2013

## # 2 Patella Supera (Alta)

- Has been shown to be associated with recurrent PF instability
- Increases the range at which there is no bony contribution to stability

Caton-Deschamps Index  
 $AT / AP = 1$



Insall. *Clin Orthop* 1972  
Kannus. *Radiology*. 1992

# *Tibial Tuberosity Distalization*

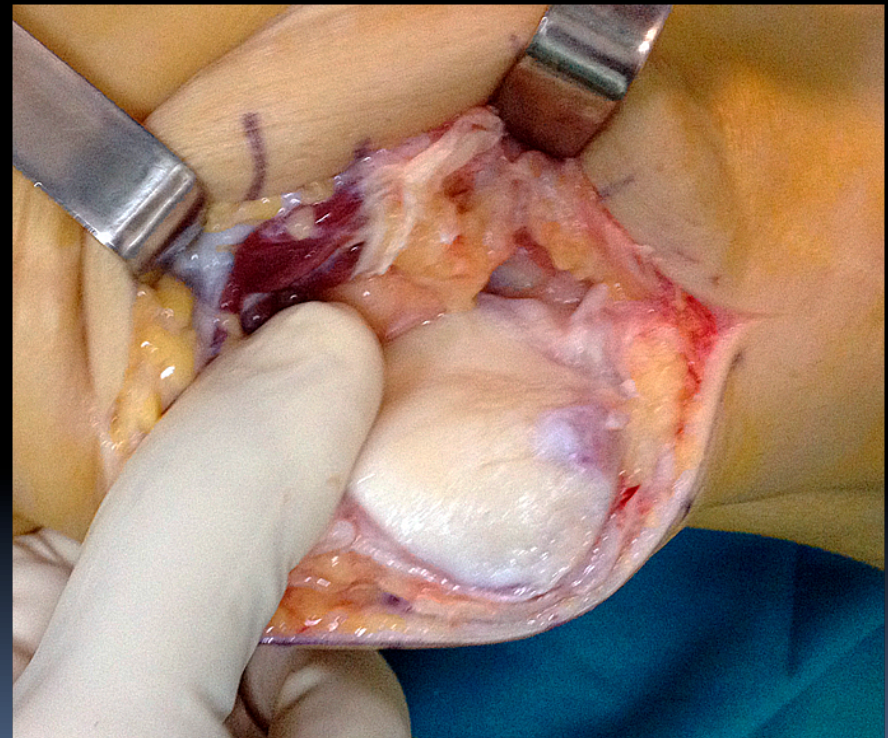
- Brings the patella into the deeper part of the trochlear groove sooner in knee flexion
- Improves stability and diminish the likelihood of dislocation



When the trochlea is shallow, distalization makes sense

# *Tibial Tuberosity Distalization*

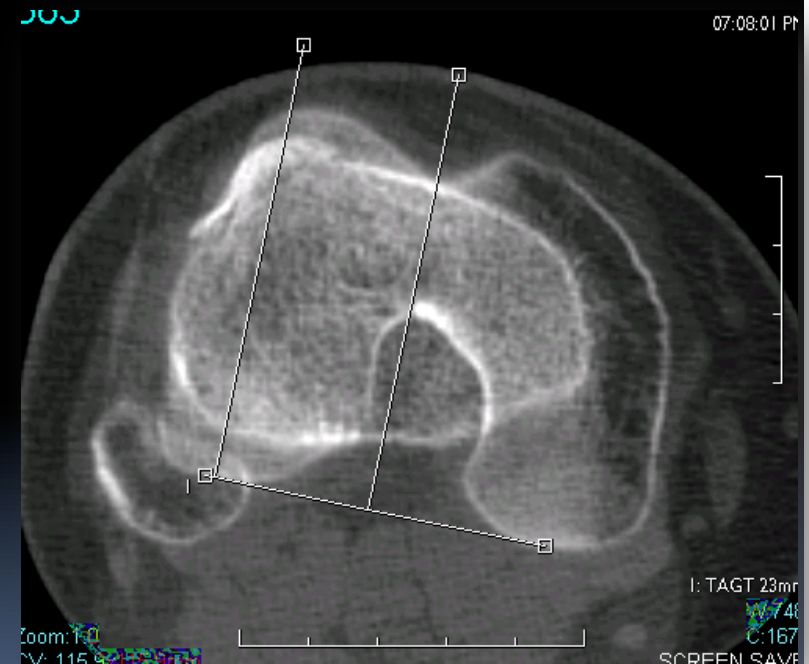
- Globally may increase PF contact pressure
- Is risky in patients with distal pole patella articular softening, as this area might experience increased loads with distalization alone



# # 3 Lower Extremity Malalignment

## INCREASED TT-TG DISTANCE

- TT-TG distance → characterizes the lateral pull of the patellar tendon acting on the patella
- Malalignment that increases the TT-TG distance increases the laterally-directed forces and thus predisposes to PF instability



Dietrich *KSSTA* 2014

# Distal Realignment

## Emslie-Trillat (no OA) / Fulkerson Procedures (OA)

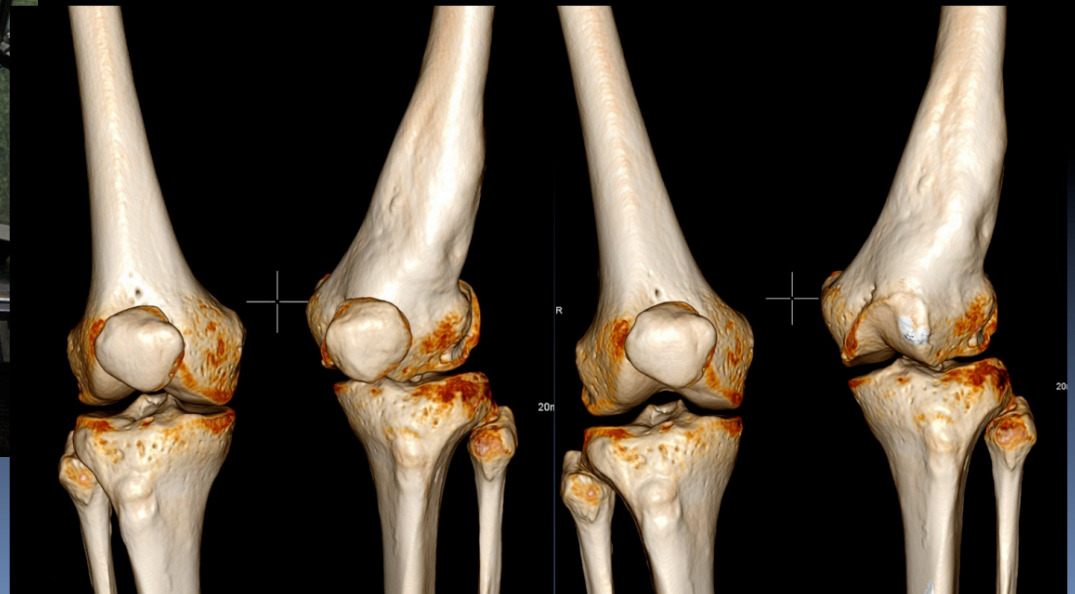
- Outcomes of the DR procedures have shown 74-95% good or excellent results
- Better outcomes in:
  - males
  - patients with intact patellar cartilage
  - cases when osteotomy was done for instability





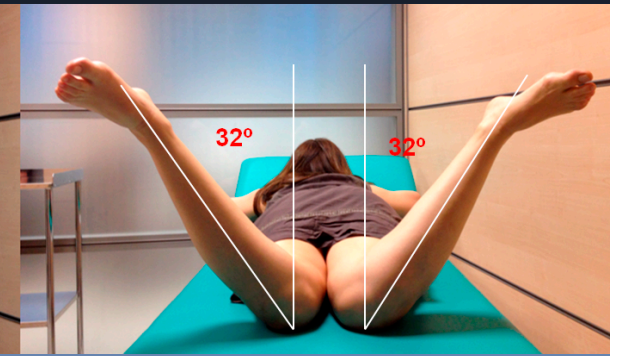
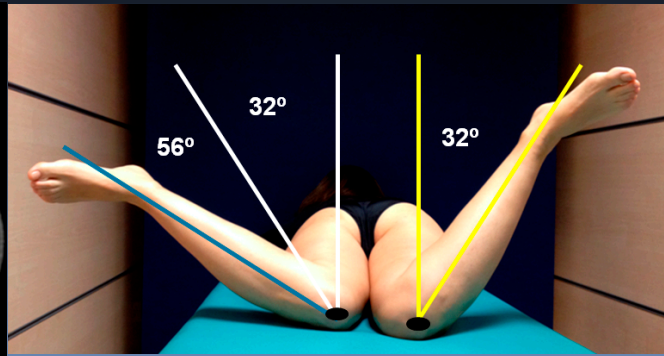
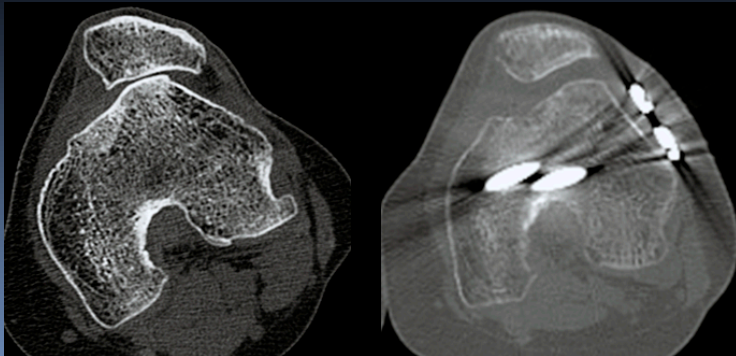
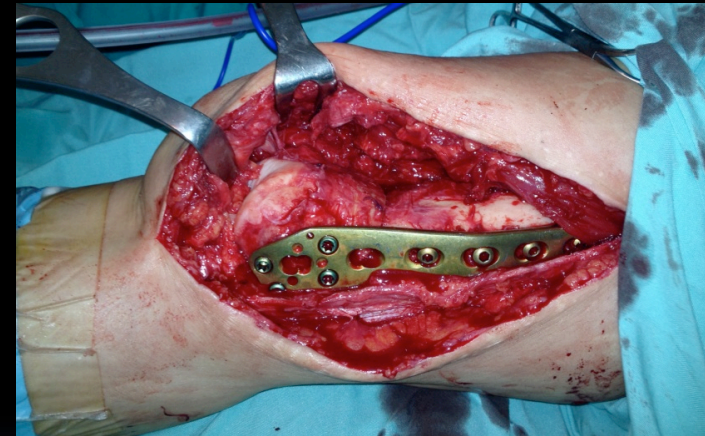
# # 3 Lower Extremity Malalignment

↑ FEMORAL AV / EXTERNAL TIBIAL TORSION

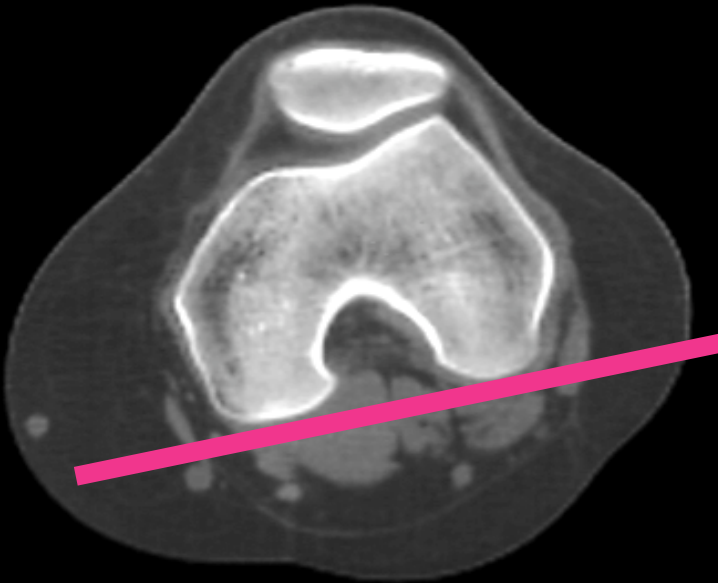
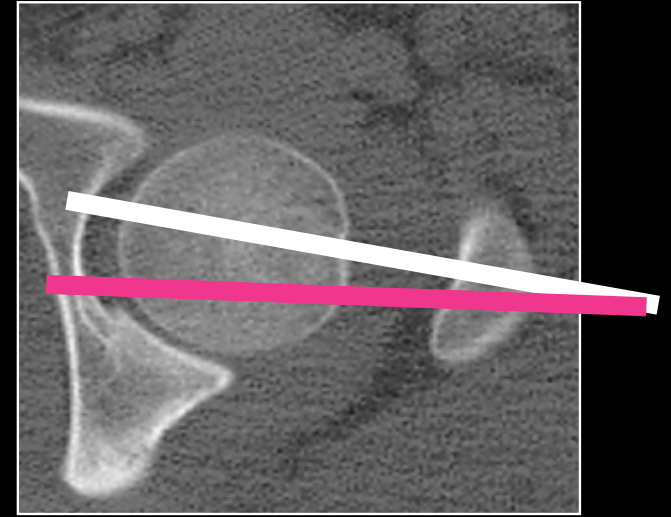
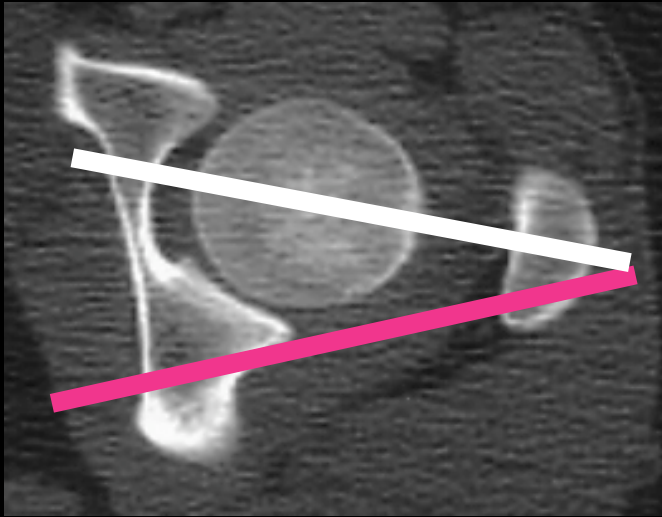


# # 3 Lower Extremity Malalignment

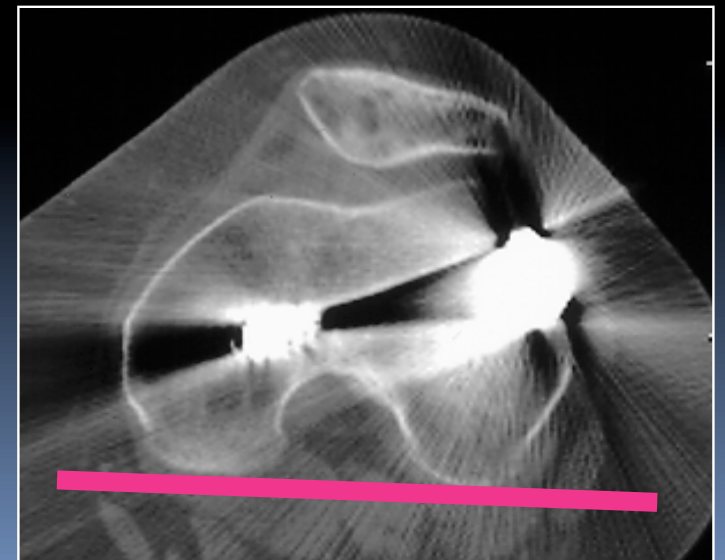
## FEMORAL DEROTATIONAL OSTEOTOMY



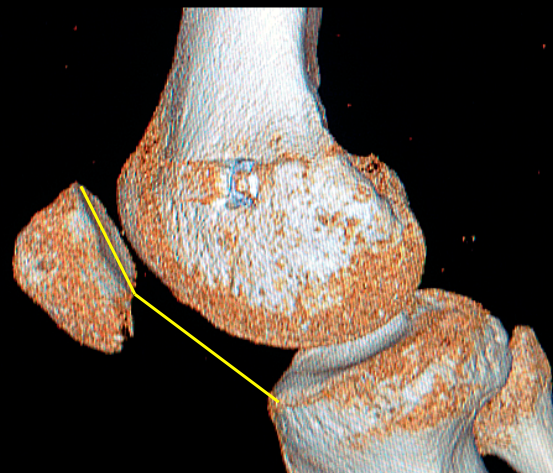
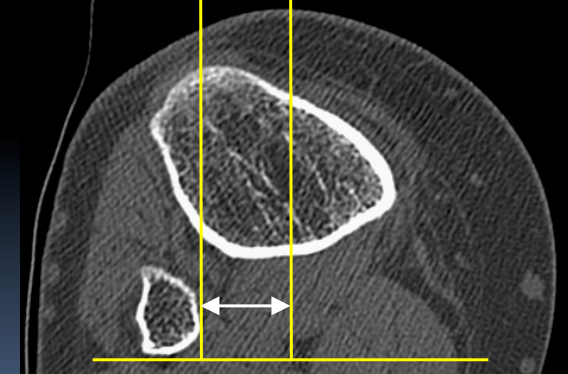
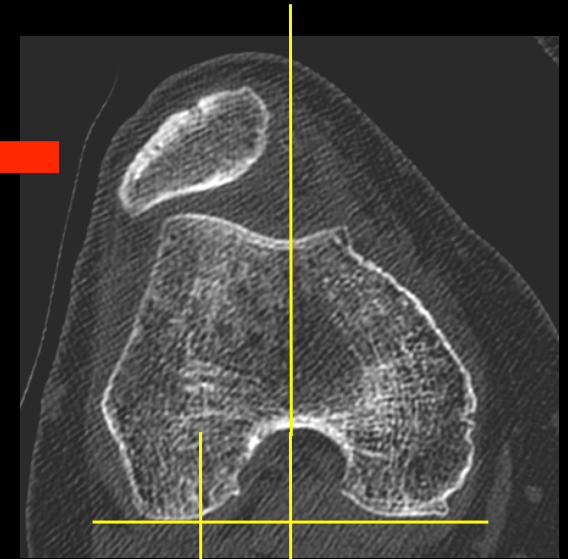
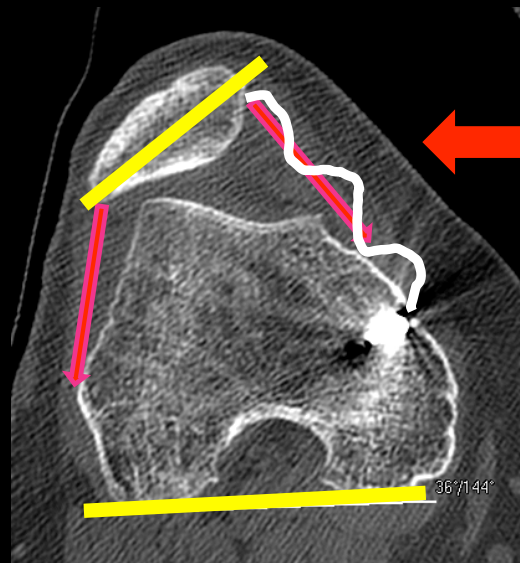
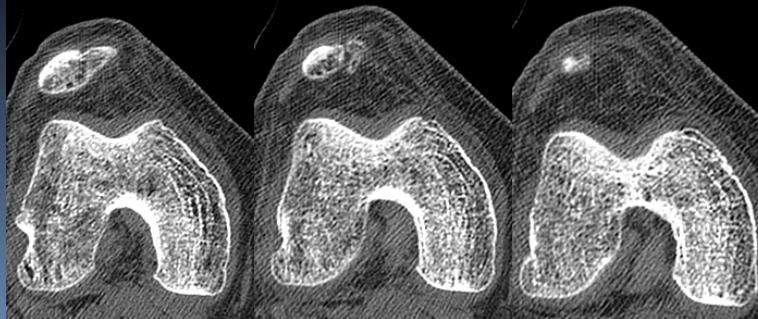
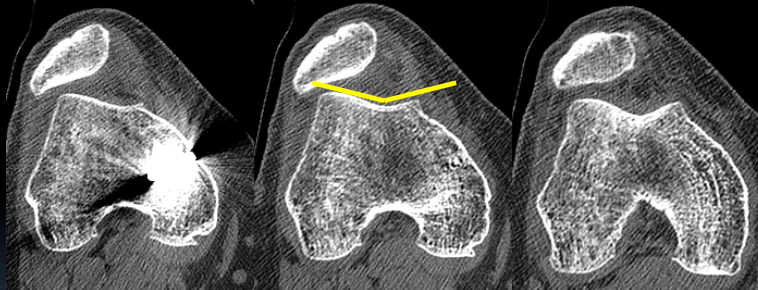
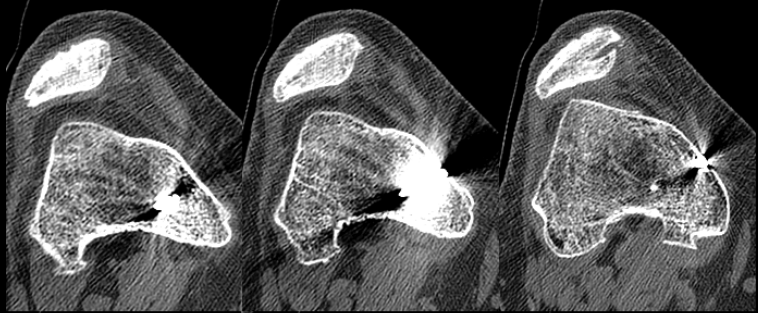
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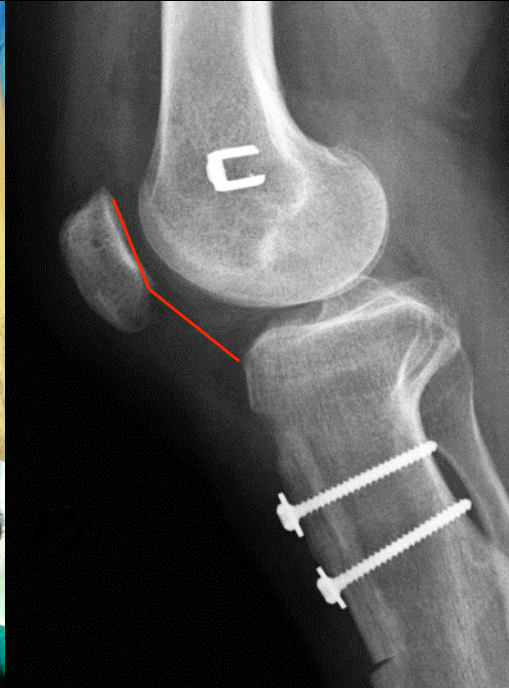
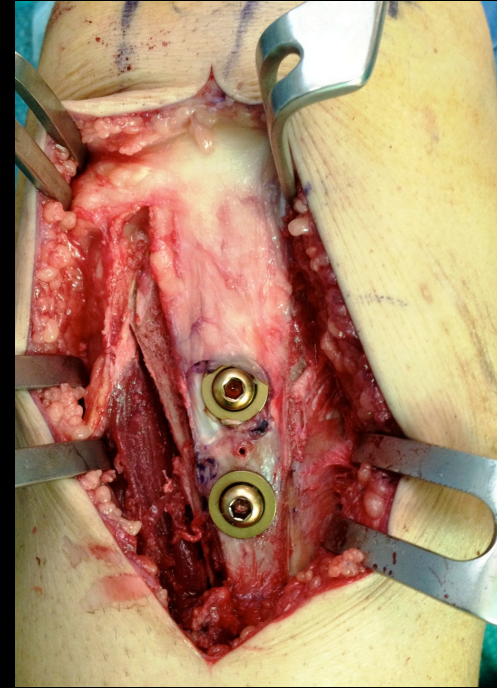
FAV  
25° → 10°



# # 4 Combined Risk Factors



Patella alta → CD index: 1.32  
Patellar tilt → 36°  
TT-TG → 22 mm



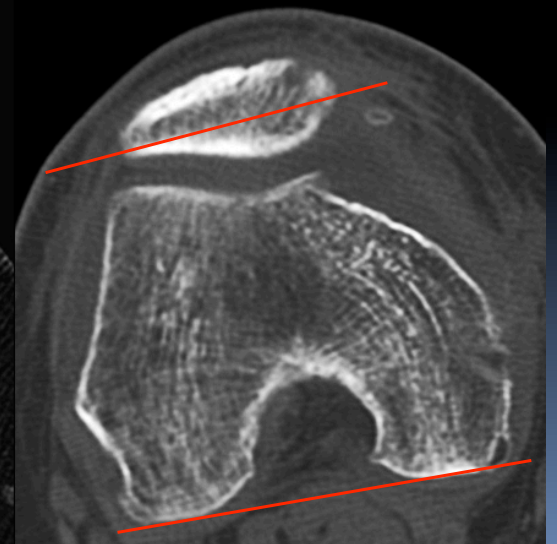
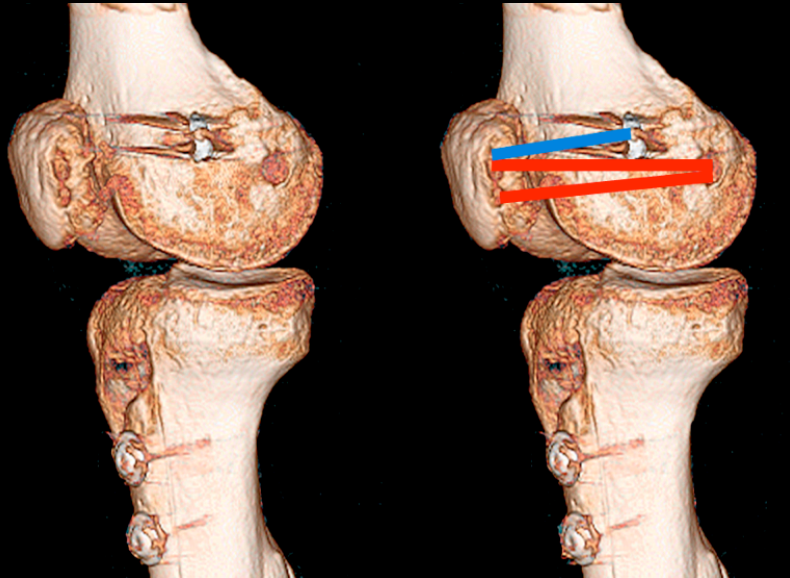
- *TT Realignment & Distalization*
- *Lateral Patellar Release*
- *MPFL R*

## POST-OP

Caton-Deschamps index: 1,04

Patellar tilt: 10°

TT-TG: 5 mm



# Conclusions

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- MPFL R is a popular procedure that can yield successful outcomes in **many** patients (limits)
- There is a lack of high-level studies evaluating the role of the procedure isolated or in combination with other frequently associated procedures (limits)
- MPFL R can be performed in patients with recurrent instability, with or without low degree of trochlear dysplasia, who have a normal TT-TG distance and a normal patellar height

# Take Home Message

**TABLE II Grades of Recommendation for the Treatment of Acute Patellar Dislocation and Chronic Patellar Instability with Associated Factors**

Disorder	Treatment	Grade of Recommendation
Acute patellar dislocation	Early medial-sided repair or nonoperative treatment	A
Chronic patellar instability with associated factors		
Patella alta	Tibial tubercle realignment	C
Medial patellofemoral ligament injury	Medial patellofemoral ligament reconstruction	C
Trochlear dysplasia	Trochleoplasty	C
Elevated tibial tubercle-to-trochlear groove distance	Tibial tubercle realignment	C

There is a need for prospective RCT comparing different surgical techniques to determine which treatment options provide optimal restoration of function, minimize recurrence, and decrease the risk of arthritic degeneration.

***SURGICAL STRATEGY –FIRST STEP***

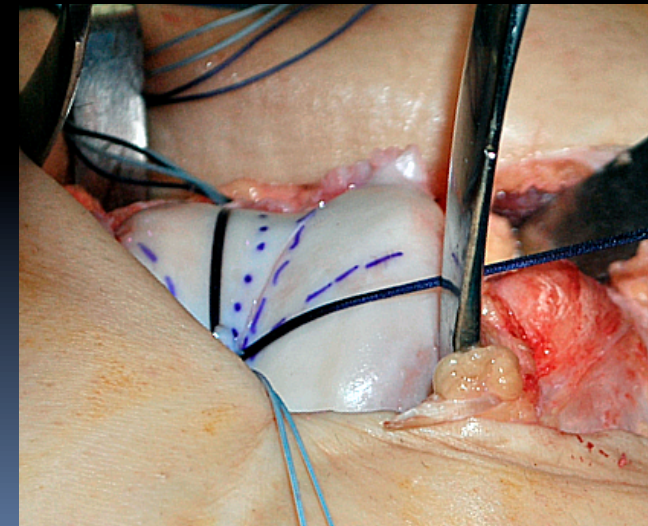
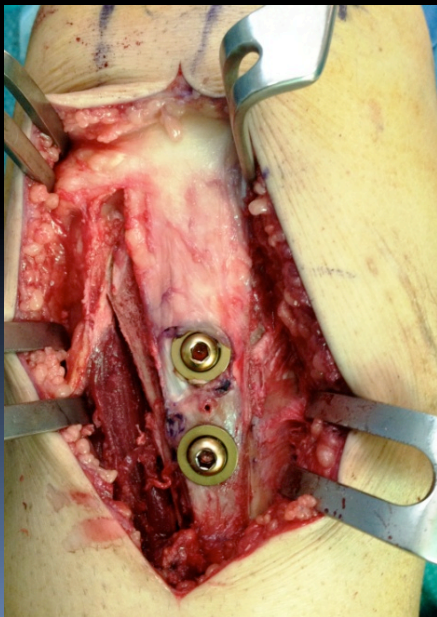
# **CORRECT MALALIGNMENT / TRACKING**

**OBJECTIVE– NEUTRALIZE LATERAL FORCES**

**TIBIAL TUBERCLE OSTEOTOMY**

**TROCHLEOPLASTY**

**LATERAL RETINACULAR RELEASE Vs LATERAL RETINACULAR LENGTHENING**





***SURGICAL STRATEGY – SECOND STEP***

**STABILIZE - CONTAINMENT - BALANCE**

**RESTORE PASSIVE MOTION RESTRAINS**



**MPFL RECONSTRUCTION**



# 17<sup>th</sup> ESSKA Congress

4-7 May 2016

Barcelona, Spain

[www.esska-congress.org](http://www.esska-congress.org)



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***Thank you***



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