Val d'Isère 2022

MPFL

Isometry – Rationale - Double bundle

David DEJOUR

LYON KNEE SCHOOL of SURGERY

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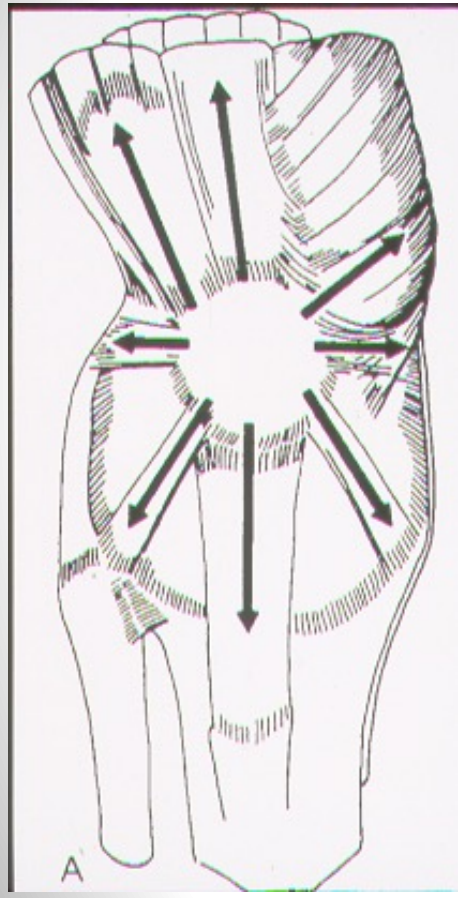
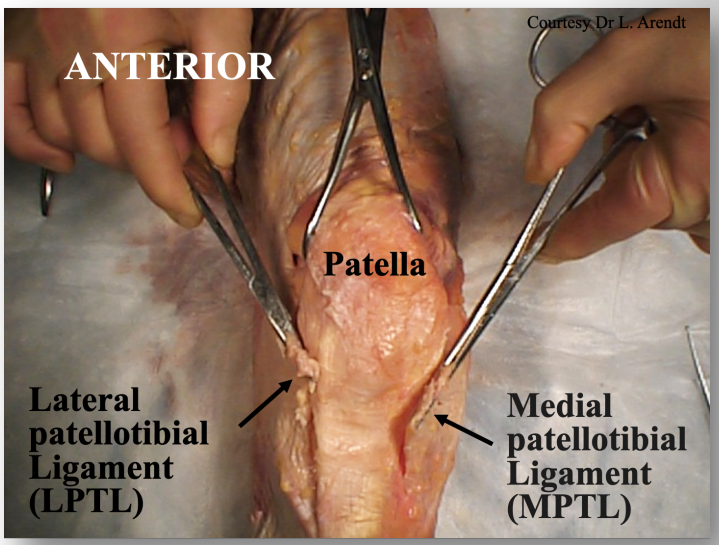
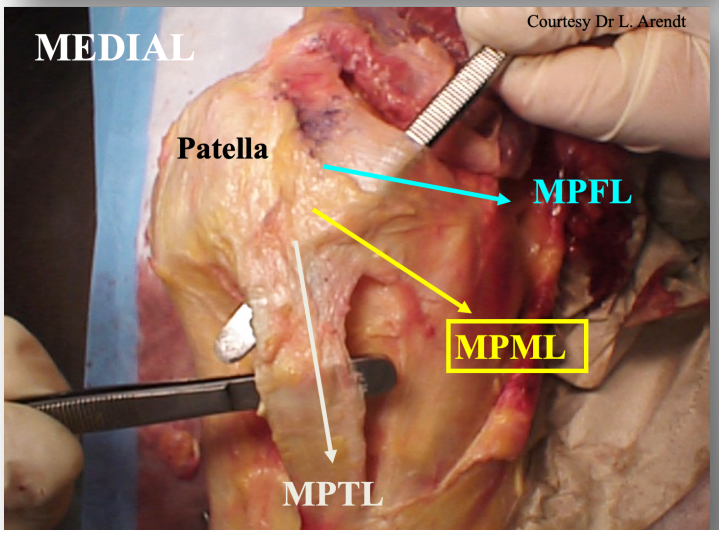
PATELLA BALANCE



- **Dynamic Forces**
  - Muscle attachments
- **Soft Tissue Restraints**
  - Patellofemoral ligaments



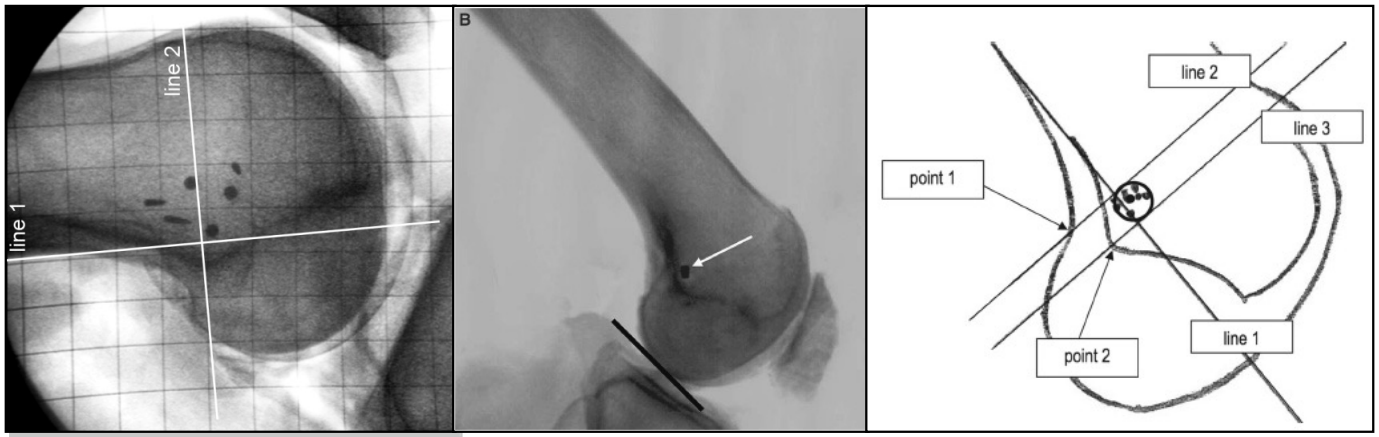


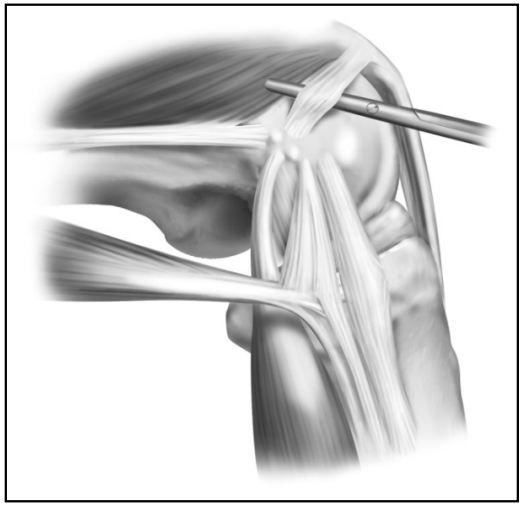
Anatomic data's

- **Mean length of the MPFL is 55 mm (varies with overall size of knee)**
- **Width may range from 3-20 mm *(femoral attachment)* to 14-30 mm *(patellar attachment)***
- **Thickness approximately 1 mm**
- **Tested to failure: 208 N *(weak compared to other knee ligaments)***

(Steensen AJSM 2004, Bicos AJSM 2008)

MPFL / Radiographic Correlation





Schottle et al. AJSM, 2007

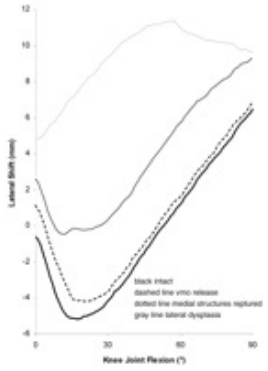
Importance of MPFL

- **Primary restraint (approx 50%) to lateral displacement of the patella (Hautamaa, CORR 1998)**
- **Presence or absence of medial restraints did not affect patellar tracking in a well-centered patella without a lateral patellar load (cadaveric study)**
- **With absence of medial restraints plus a lateral patellar load, there was lateral tracking of the patella.**
- **Conclusion from Sandmeier study: MPFL acted as a check-rein to laterally directed patellar forces (Sandmeier et al, AJSM 2000)**

Importance of MPFL

- **Prevention of patellar dislocation (Checkrein to restrain ABNORMAL laterally directed forces)**
- **Possibly initates smooth entry of the patella into the femoral sulcus**

(Amis *Knee 2003)*



Bicos et al AJSM 2008

Isometric vs Nonisometric

Isometric ***(Steensen AJSM 2004)***

"During knee flexion from 0° to 90°average change in length of only 1.1mm.

Statistical analysis showed the superior femoral attachment to be most significant in determining isometric behavior."

Nonisometric ***(Amis, Knee 2003)*:**

MPFL tight with the knee in full extension, loosing tension on flexion of the knee and on patellar stabilization within the normal trochlea past 15° to 20° of knee flexion.

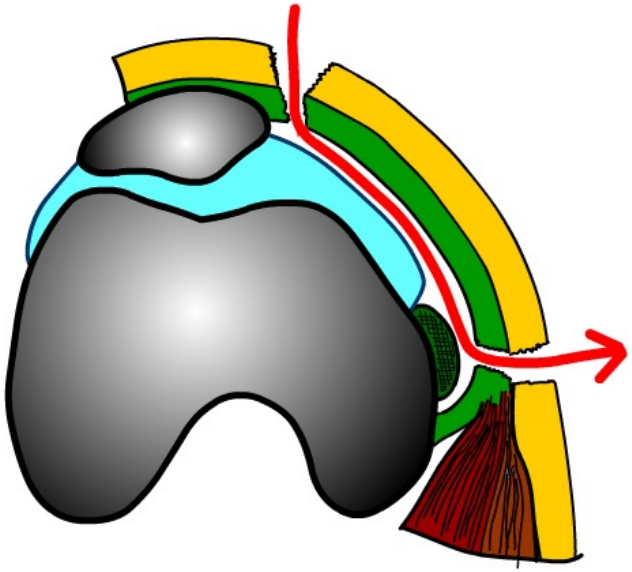
MPFL Techniques …

Numerous techniques but the first was Brazilian !

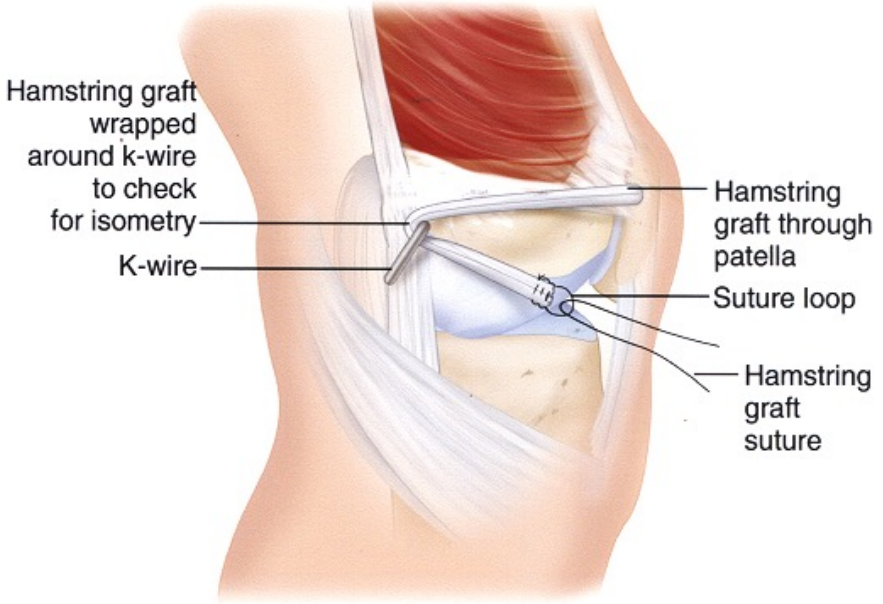
Ellera Gomes JL. Medial patellofemoral reconstruction for recurrent dislocation of the patella: a preliminary report. *Arthroscopy.* **1992**

- **Soft tissus procedure**
- **Bony procedure**
- **Mix procedure**

Soft tissus MPFL …

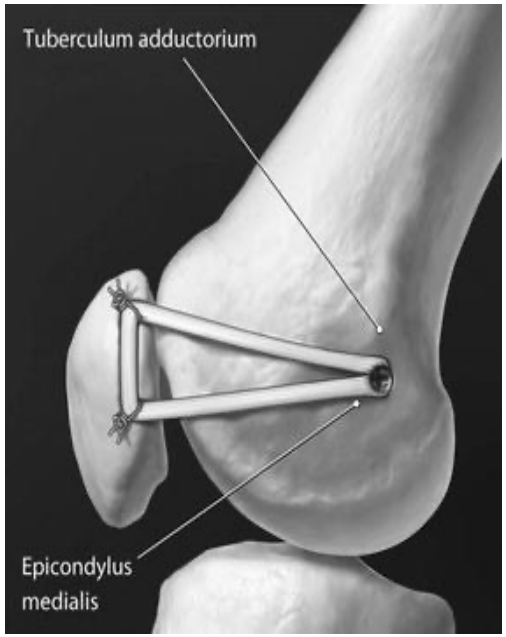


Vincent Chassaing (Fr)
All in sub cutaneous technique

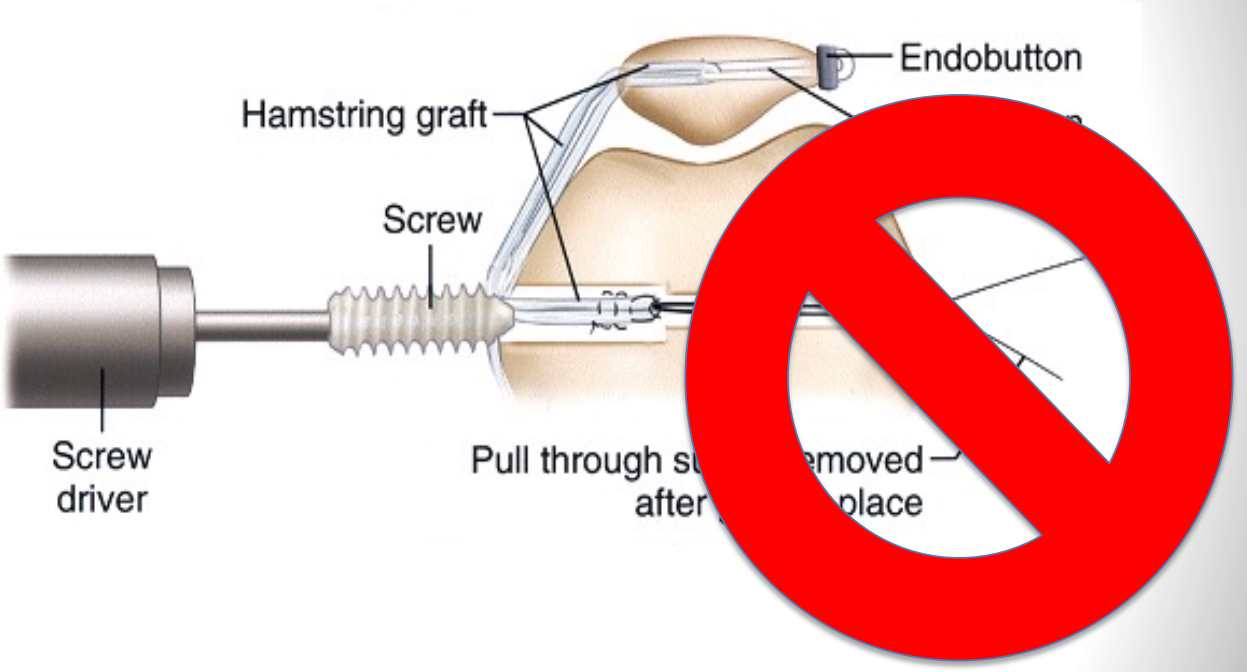


Third adductor fixation

Bony procedure MPFL …

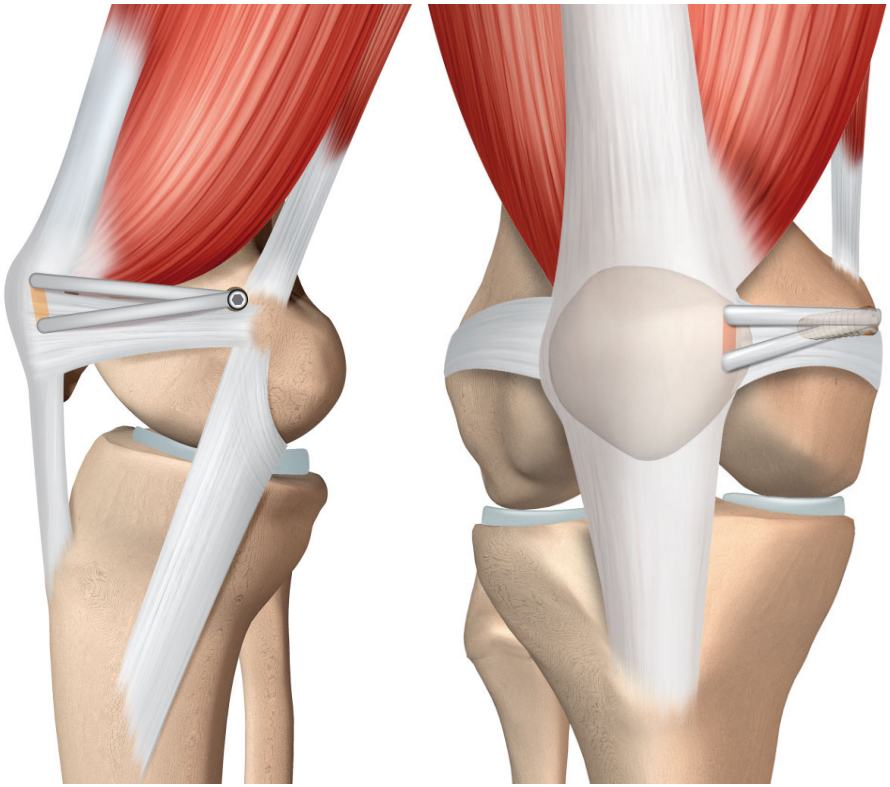


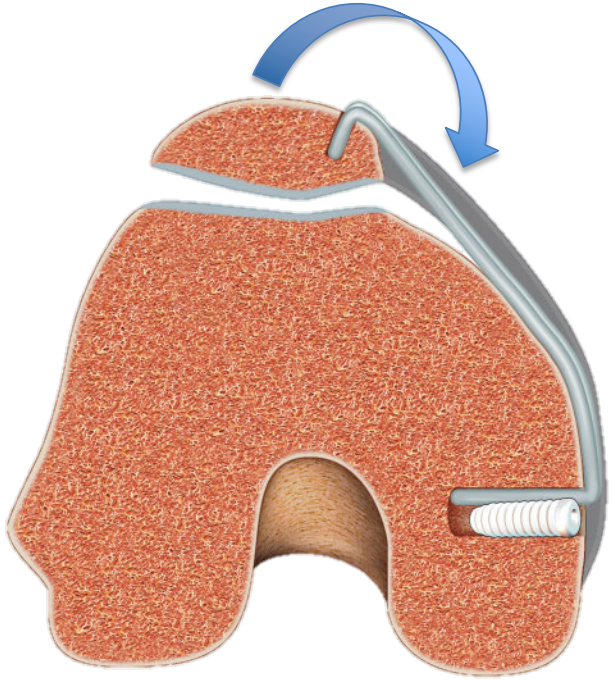
Anchor on patella
Blind tunnel on femur



Trans patella tunnel…

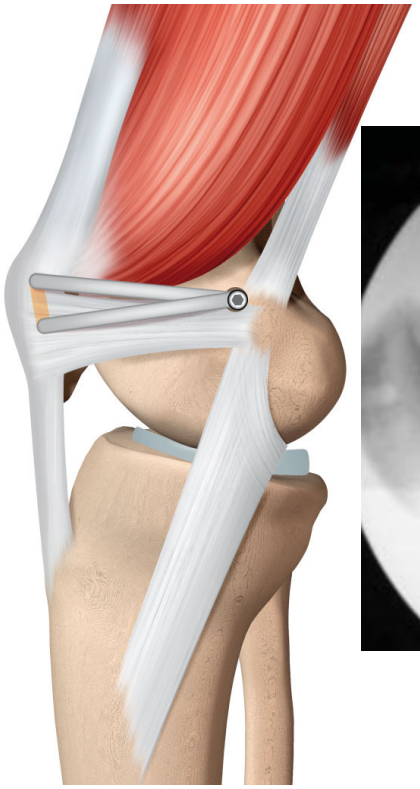
Prefered technique

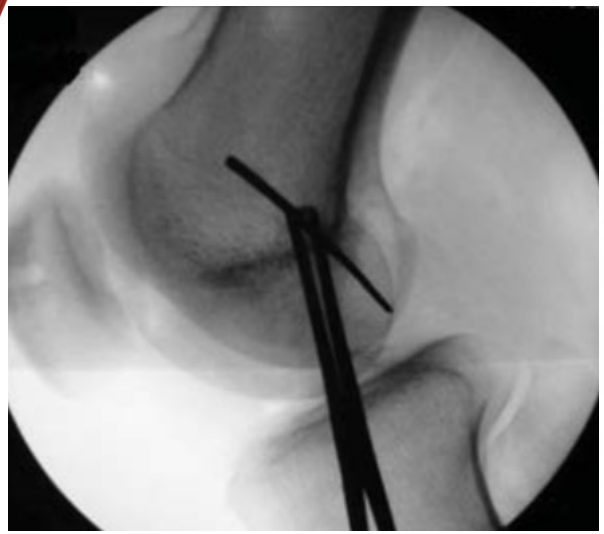




- Gracilis
- Patellar tunnel on the anterior cortex (no hard ware)
- Femoral tunnel : Floroscopic control
- Tension : Fixation in flexion (isometry) No real tension !!!

Fluoroscopic control !!! Always !!!





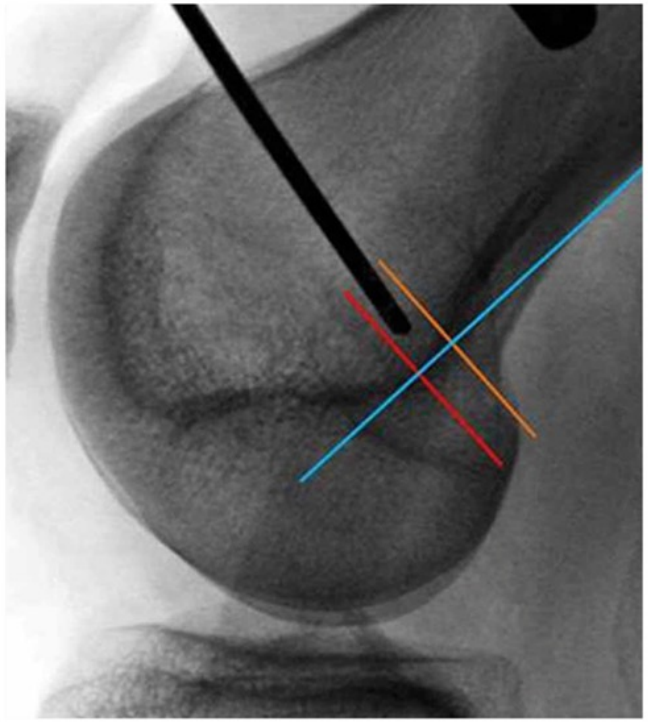


Figure 1. Intraoperative localization of Schöttle point. Blue line is drawn down posterior femoral cortex; orange line marks transition of curve of posterior femoral condyle and is perpendicular to blue line; red line is at posterior aspect of Blumensaat line and is also perpendicular to blue line.

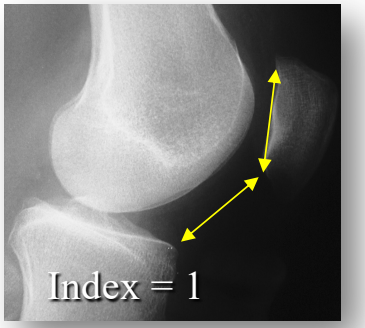
Reproduced with permission from *Orthop J Sports Med.*[23]

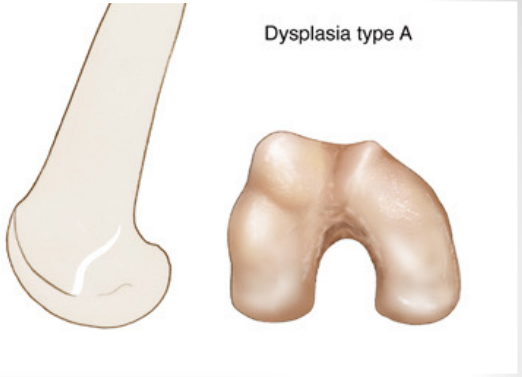
What do we recommend?

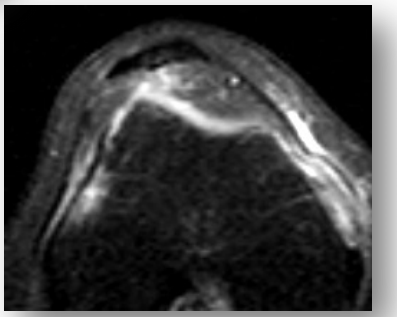
Isolated MPFL indication

Low grade dysplasia

- Trochlear dysplasia A
- Patella height < 1.2
- TT-TG < 20 mm
- MPFL rupture







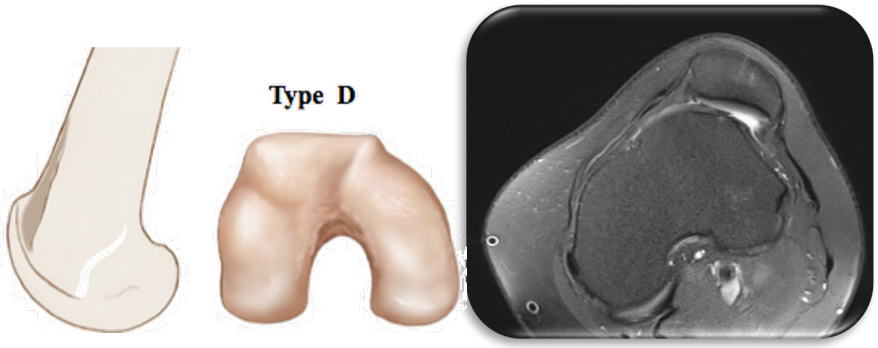
The best !

What do we recommend?

MPFL indication ?

High grade dysplasia

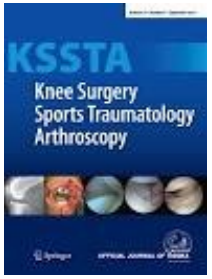
- Trochlear B,C,D
- Patella Alta >1.2
- TT-GT > 20mm
- Tilt > 20°

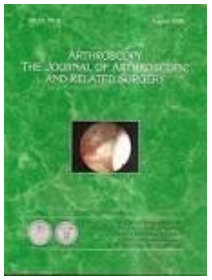


Correct them first

MPFL Associated Procedure

What does the literature says ?





- **Easy to do**
- **Small scares comparing to old fashion TT osteotomies**
- **Very “Sexy” and Attractive…**

We want to be efficient & not aggressive but how to reach the Cristal Globe ?

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MPFL Failures 26 %

Am J Spo
A systematic re
ligament reconstructi
Shah JN1, Howard JS, Flanigan D[illegible], Lattermann C.

David Dejour - *Vinicius Khun - Guillaume* ***Demey***

LYONORTHOCLINIC

http://www.lyon-ortho-clinic.com ***FRANCE***

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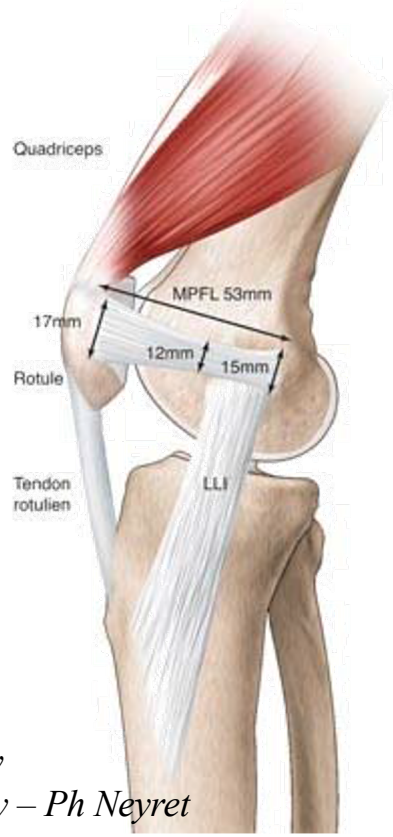
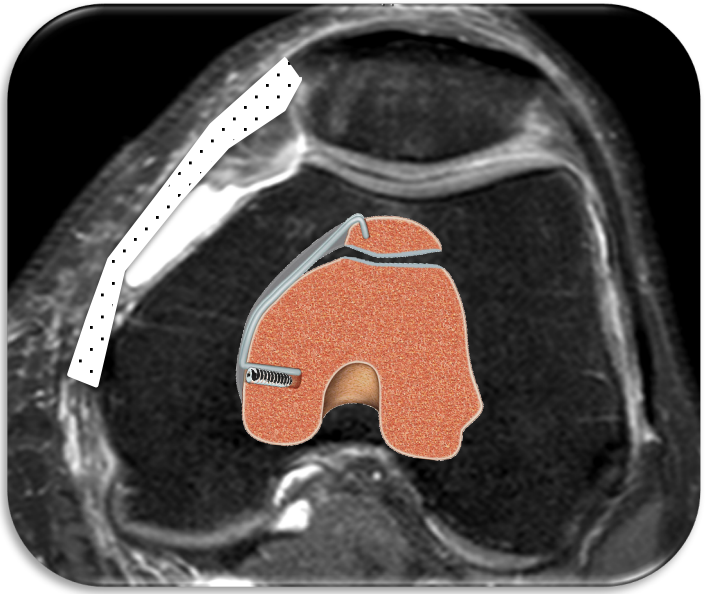
MPFL works well if the patella is facing the trochlea …



Courtesy
G Demey – Ph Neyret

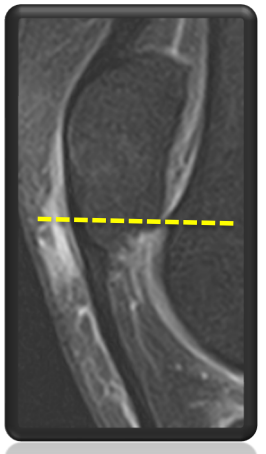


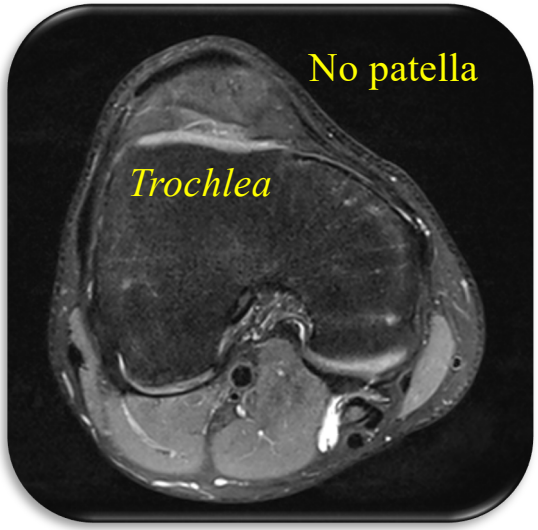
BUT …

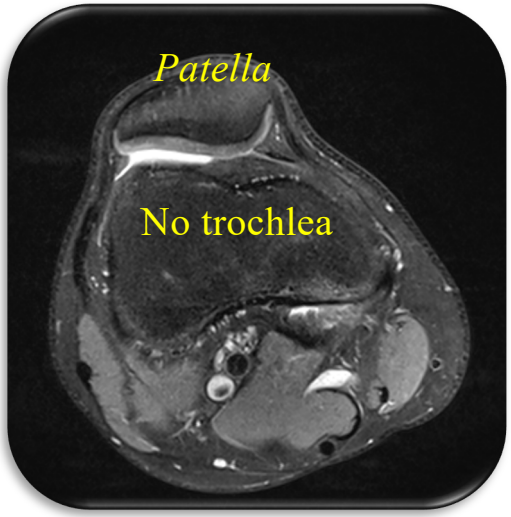
If patella is not facing the trochlea

MPFL will not act in proper mechanical conditions

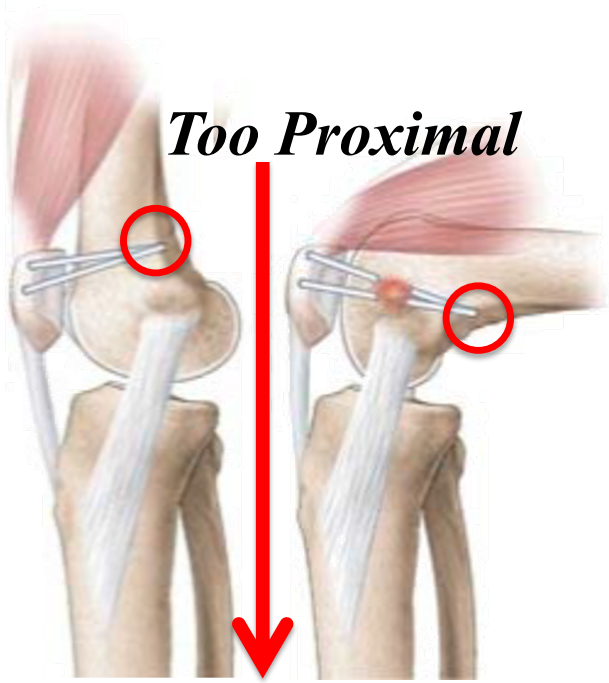
- **Fatigue rupture**
- **Pain**
- **Tunnel widening** ***(Servien E. Am J Sports Med. 2014)***
- **Recurrence**



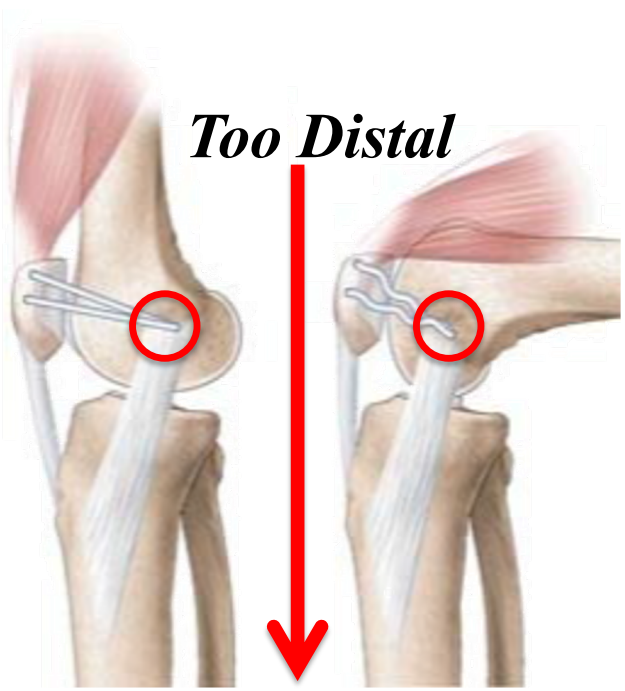




Wrong placement of MPFL identified cause of failure



Tight in flexion



Loose in flexion

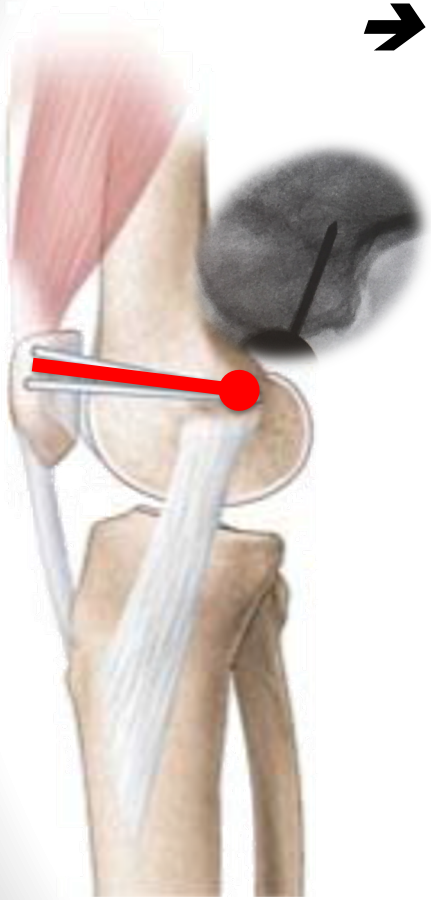
Courtesy
G Demey – Ph Neyret

Thaunat M, Erasmus P
Management of overtight medial patellofemoral ligament reconstruction. KSSTA 2009

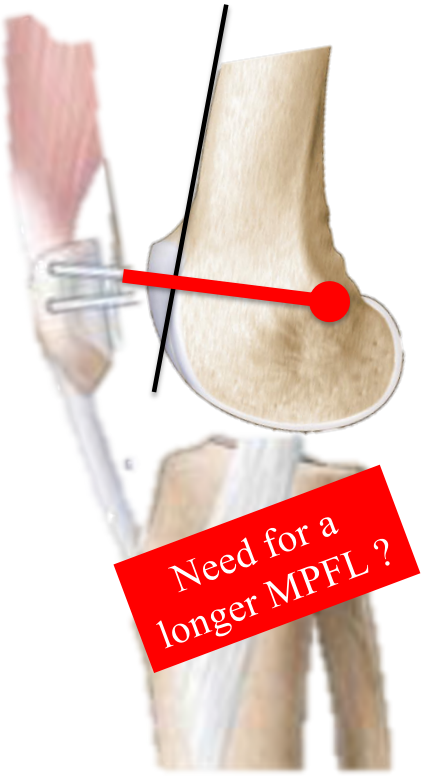
Perfect placement of MPFL (femoral)

But IF the patella has not the right position

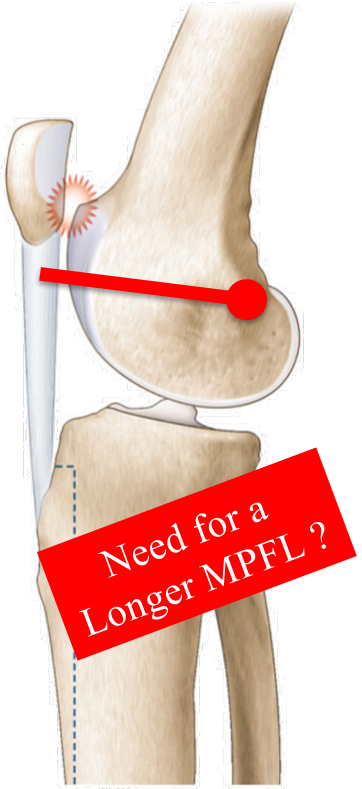
➔ Same effect has a wrong placement !!!



Normal Trochlea



Dysplasia + Bump

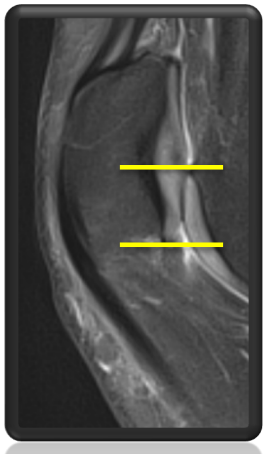


Patella Alta

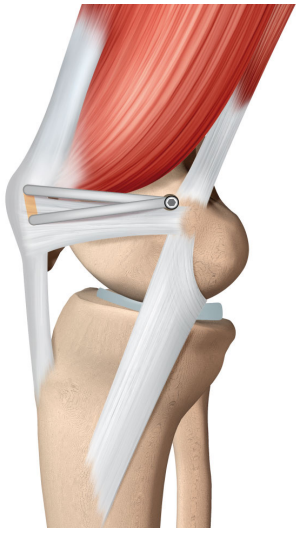
Patella Alta

X-ray Index > 1.2 + MRI Engagement

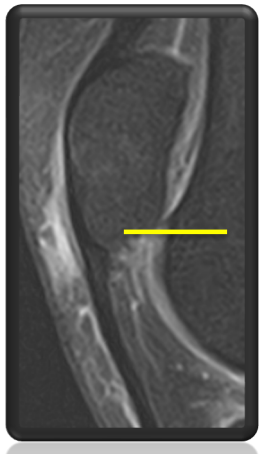
Positive engagement



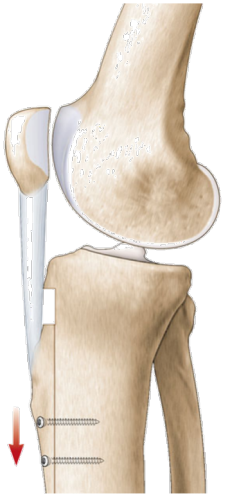
Isolated MPFL



Negative engagement



Distalization + MPFL



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Conclusion

David DEJOUR

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Surgical planning

- **“A la carte” surgery**
- **Step-by-step correction:**

MPFL needs always to be done …

- Correct trochlea dysplasia: If needed
- Correct alignment: medialization
- Correct patellar height: “distalization”


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