Failure of MPFL reconstruction

How to deal with

Ph Neyret

E Servien
S Lustig

Lyon University

Patellofemoral
FOUNDATION

Disclosure: I have no conflict of interest with this presentation

LYON GENOU CENTRE ALBERT TRILLAT

FIFA

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European Federation of National Associations of Orthopaedics and Traumatology
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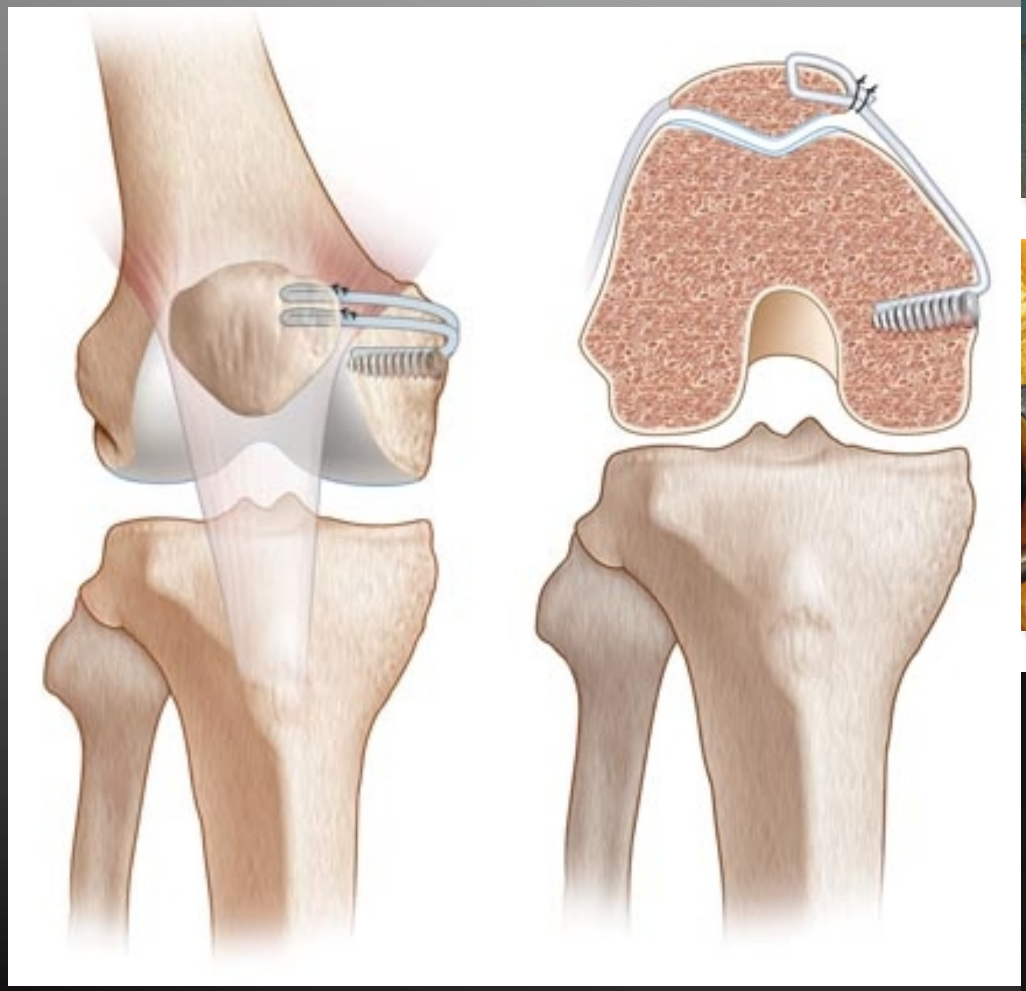
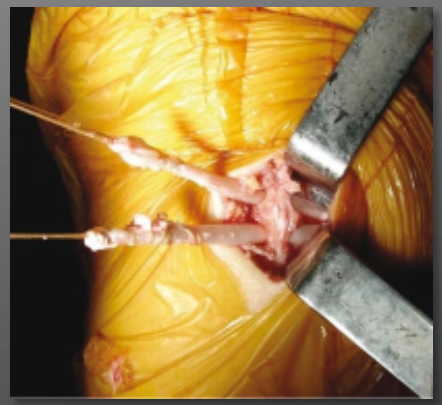
EFORT – JOINT EFFORTS

INTERNATIONAL SOCIETY OF ARTHROSCOPY, KNEE SURGERY & ORTHOPAEDIC SPORTS MEDICINE · 1995 ·

EUROPEAN SOCIETY OF SPORTS TRAUMATOLOGY, KNEE SURGERY AND ARTHROSCOPY
ESSKA

MPFL Reconstruction



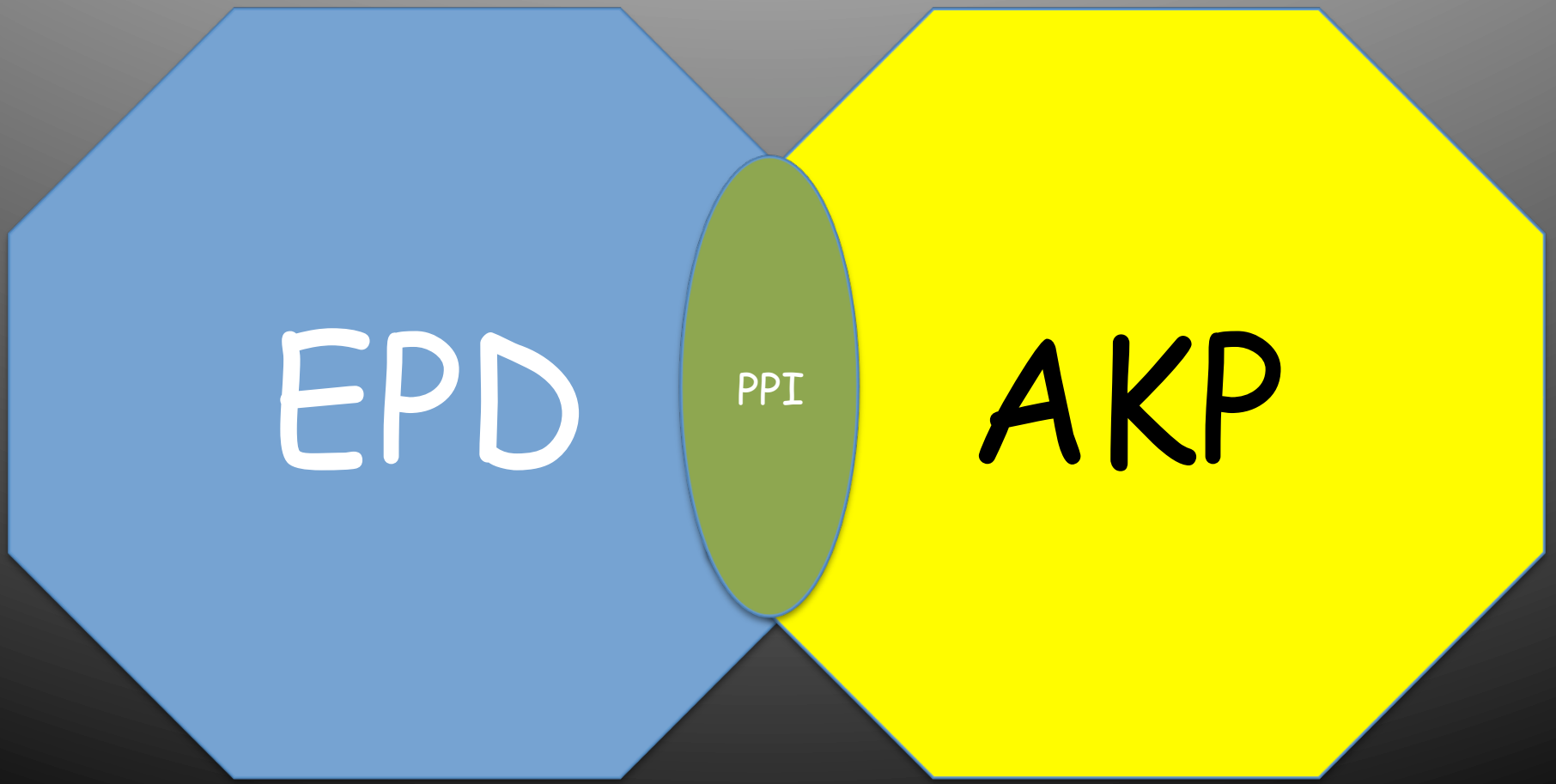


Causes of failures

Understanding these complications can help us to avoid pittfalls during surgery, as well as to appropriately address failures of the setting of revision surgery.

- Misunderstanding
- Misdiagnosis
- Incomplete treatment
- Complications of treatment

Diagnosis



Comprehensive surgery

- The following procedures are generally easy, but can be lead to significant complications if not carried out with prudence and for the correct indications.
- These techniques are not indicated for painful patella syndrome, which can be worsened by these procedures.

Diagnosis

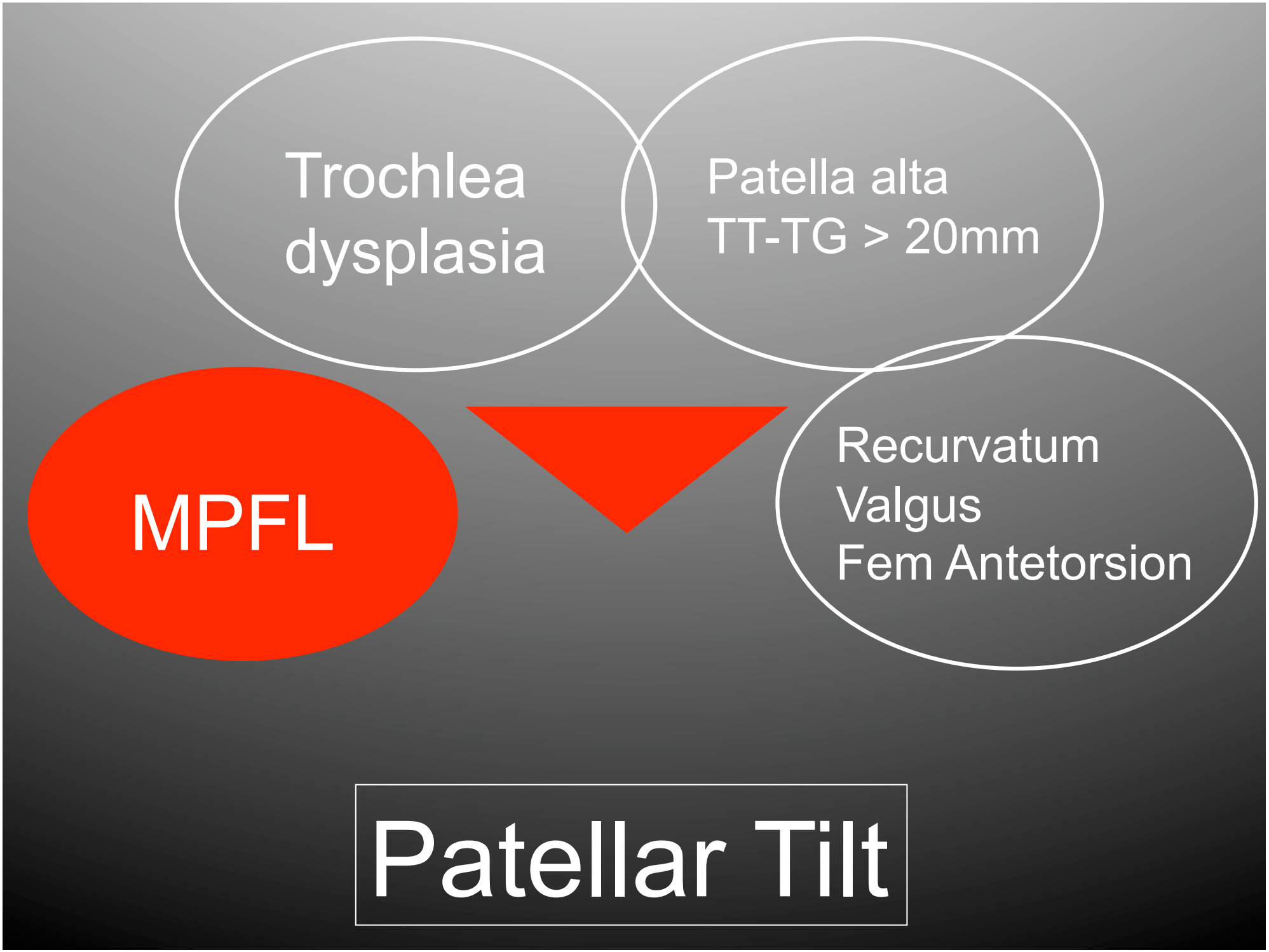
- Anamnesis
- Chief complain
- Current Symptoms
- Physical examination systematic/comparative
- Recent New complete radiological check-up
- Previous operative report (s)

Complete analysis as if it was the First clinics whatever if you did the previous surgery or not

Predisposing factors

+/-Trauma


The Rhône


Trochlea dysplasia
Patella alta
TT-TG > 20mm
MPFL
Recurvatum
Valgus
Fem Antetorsion
Patellar Tilt

A systematic review of complications and failures associated with MPFLR for recurrent patellar dislocation.

- 25 articles
- A total of 164 complications occurred in 629 knees (26.1%). These adverse events includes patellar fracture, clinical instability on postoperative examination, loss of knee flexion, wound complications and pain.
- 26 patients returned to the operating room for additional procedures.

MPFLR has a high rate of success

The complication rate of 26.1% is not trivial.

Am J Sports Med. 2012.

Shah JN, Lattermann C

Complications MPFL R 25% +/- 21

- Improper technique

  Overtension: Checkrein/ Strenghten the graft in flexion

  Poorly positionned: Visual inspection of Adduction tubercle- epicondyle. Fluoroscopic or Anatomometric perop control
- Loss of motion
- Overpressure medial PF joint (Pain, OA)
- Recurrence of lateral patella Instability (8%)
- Painful harware requiring hardware removal
- Patella fractures

* Shah AJSM 2012

In Vivo Positioning Analysis of Medial Patellofemoral Ligament Reconstruction

Elvire Servien,*† MD, PhD, Brett Fritsch,‡ MD, Sébastien Lustig,† MD, Guillaume Demey,† Romain Debarge,† MD, Carole Lapra,§ MD, and Philippe Neyret,† MD
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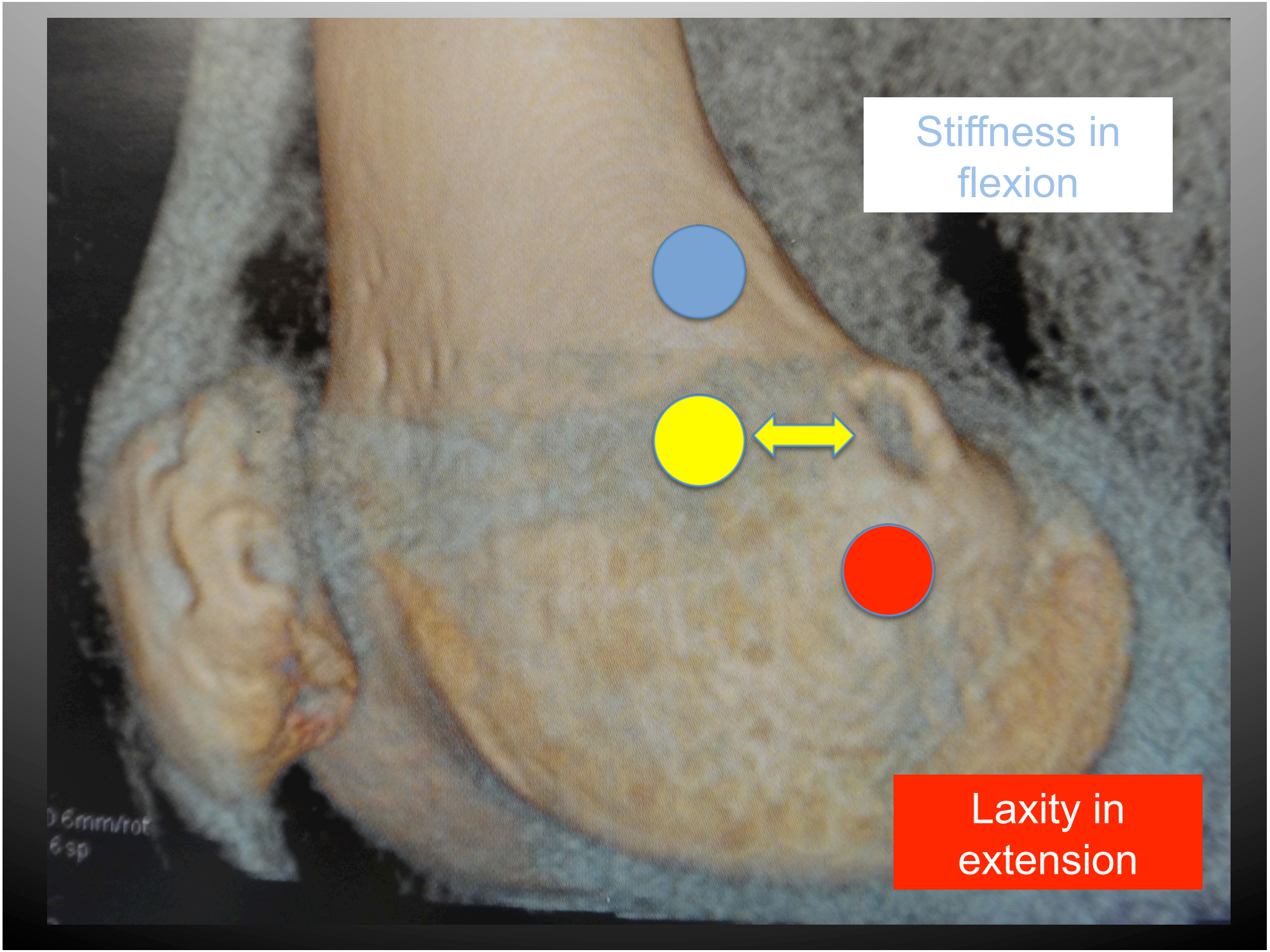
AJSM 2010


Stiffness in flexion
Laxity in extension

Isolated and combined MPFL R.

42 patients @ 24 mths FU

Isolated MPFL 15

Combination procedure 27

S or Very Satisfied 87%

multifactorial problem

MPFL reconstruction, alone or in combination, seems to be an effective treatment for recurrent patellar dislocations after a failed previous surgery, leading to significant increases in stability and functionality as well as a reduction in pain.

Am J Sports Med. 2013

Kohn LM, Schöttle PB

Analysis of failure and clinical outcome after unsuccessful MPFLR in young patients

19 patients

age @ primary MPFL Rwas 18.4 y.

age @ index operation 20.2

3 main reasons for failed MPFLR

neglected additional risk factors (5 severe trochlear dysplasia, 2 excessive femoral anteversion)

intra-operative technical errors (7 experienced pain with limited flexion: 3 anterior femoral tunnel and 4MPFL graft overtensioning

inappropriate patient selection

S or Very Satisfied 78.9%

Partially S 15.8%

Not S 5.3%

Int Orthop. 2014. **Nelitz M & al**

Identifying the potential causes of failure can help to treat and possibly prevent future complications.

Patella fracture after MPFL R. using suture anchors.

- We feel that this is an important learning point when initially using this technique (suture anchors) , and should be disseminated to other surgeons who undertake this surgery.

Knee. 2013 Dhinsa BS, Bhamra JS, James C, Dunnet W, Zahn H.

Patellar fr. after MPFLR/repair: a report of five cases

- 5 Patients TU 22mts 6 to 41
- In 1992, in a series of 30 patients, Ellera Gomes reported the 1st patellar fr. after MPFLR (transverse patellar tunnel)
- Since 8 patellar fr. reported with use of patellar bone tunnels.

  4 due to technical errors associated with patellar tunnel placement.

  4 medial rim avulsion fr. of the patella after MPFLR
- Fr of the superior pole (sleeve avulsions) reported after medial soft-tissue imbrication and lateral retinacular release; to our knowledge,
- proximal patellar fractures after MPFL reconstruction or isolated soft-tissue repair

Parikh SN, Wall EJ J Bone Joint Surg Am. 2011

Patellar fr. after MPFLR/repair: a report of five cases

- Most fractures occur within 3 months
- Challenging to manage patellar fr. in the post-operative period immobilization is recommended for 6wks after fracture fixation and then aggressive physical therapy

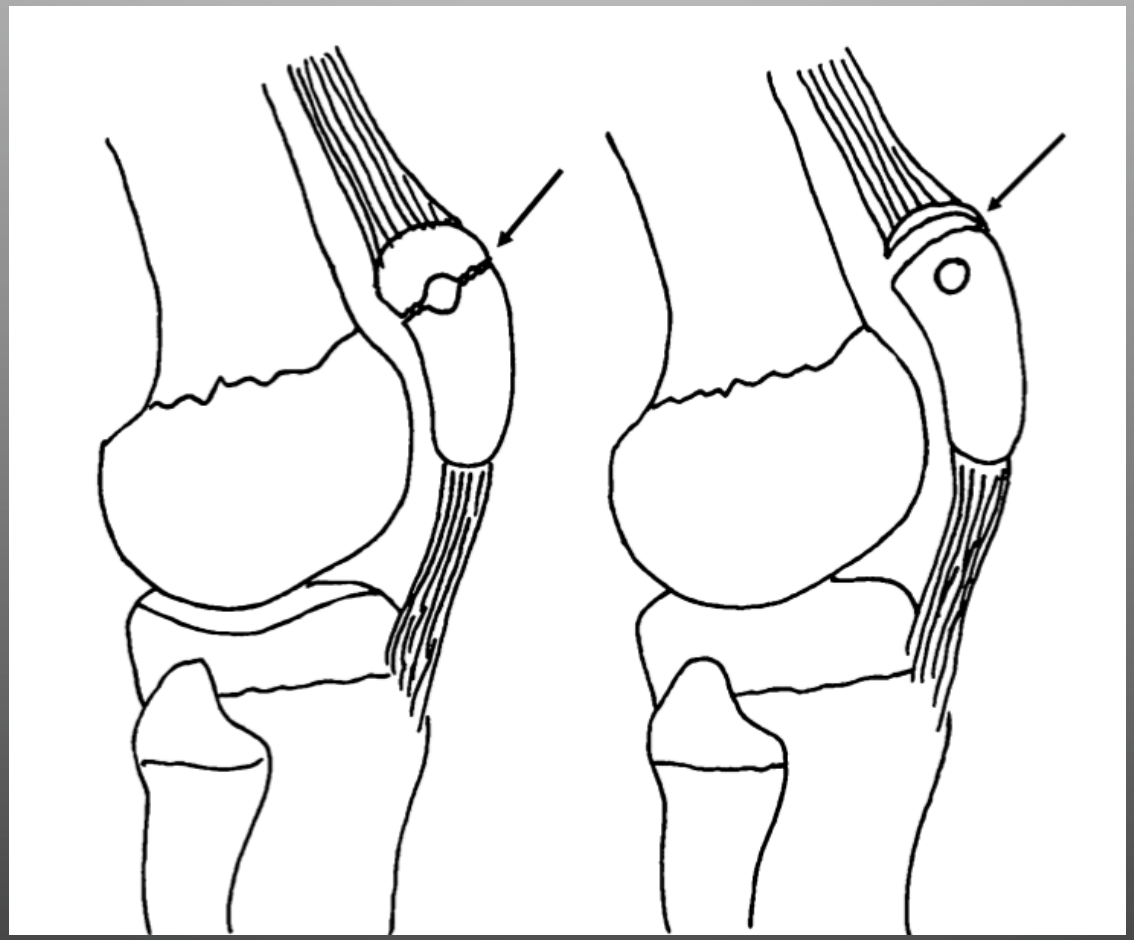
Parikh SN, Wall EJ J Bone Joint Surg Am. 2011

Patellar fr. after MPFLR/repair: a report of five cases

- Type-I fr are transverse through the patellar tunnel or drill hole: tension-band wiring.
- Type-II fr are superior pole fr, or sleeve avulsion fr, associated with proximal realignment, lateral release, or excessive dissection near the superior aspect of the patella: similar to quadriceps tendon tear.
- Type-III fr. are medial rim avulsion through drill holes in the patella, associated with recurrent patellar dislocation: open reduction and internal fixation of the bone fragment with the use of screws and suture anchors, and all had excellent outcomes.

Parikh SN, Wall EJ J Bone Joint Surg Am. 2011

Type 1

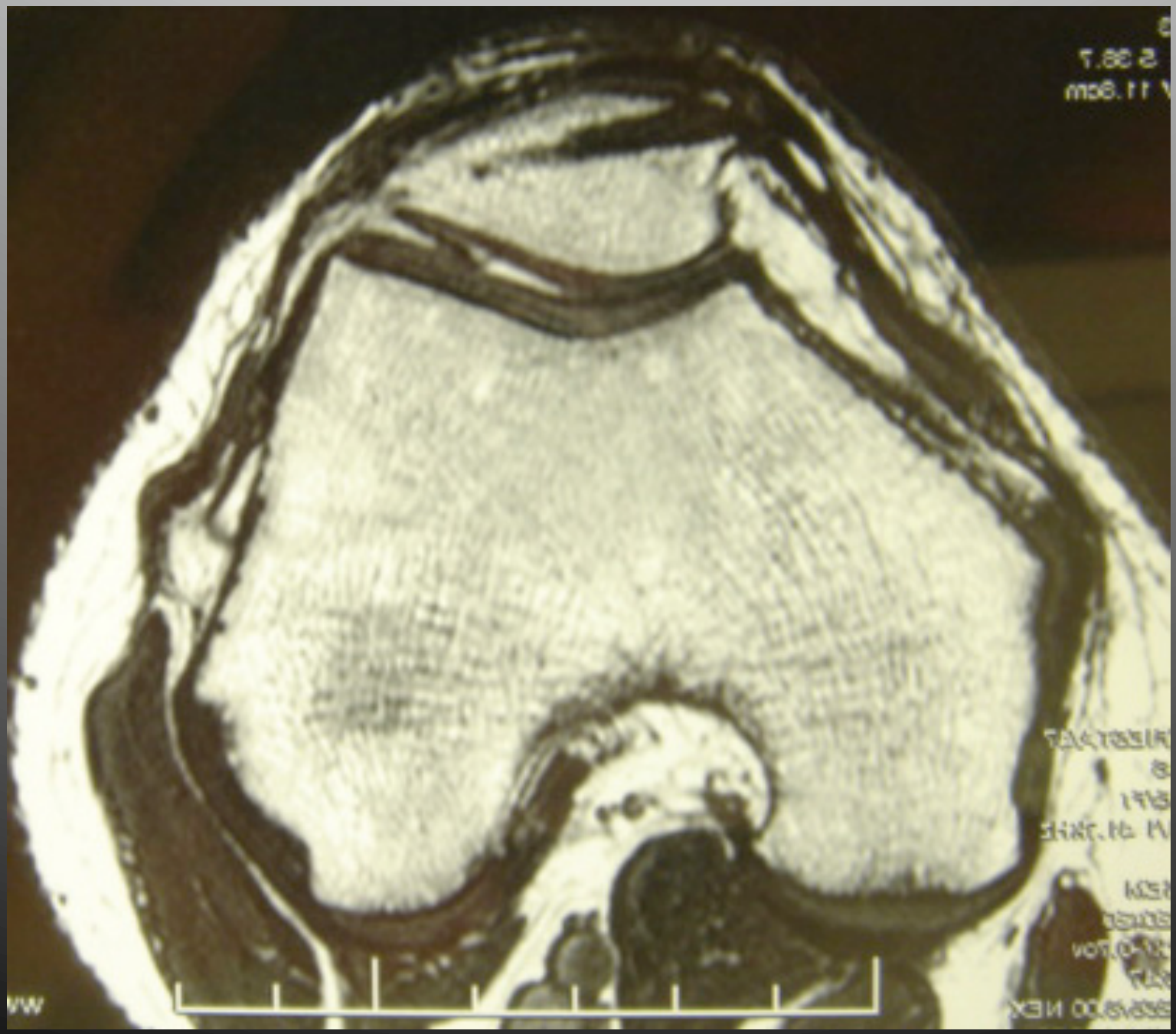


Type 2

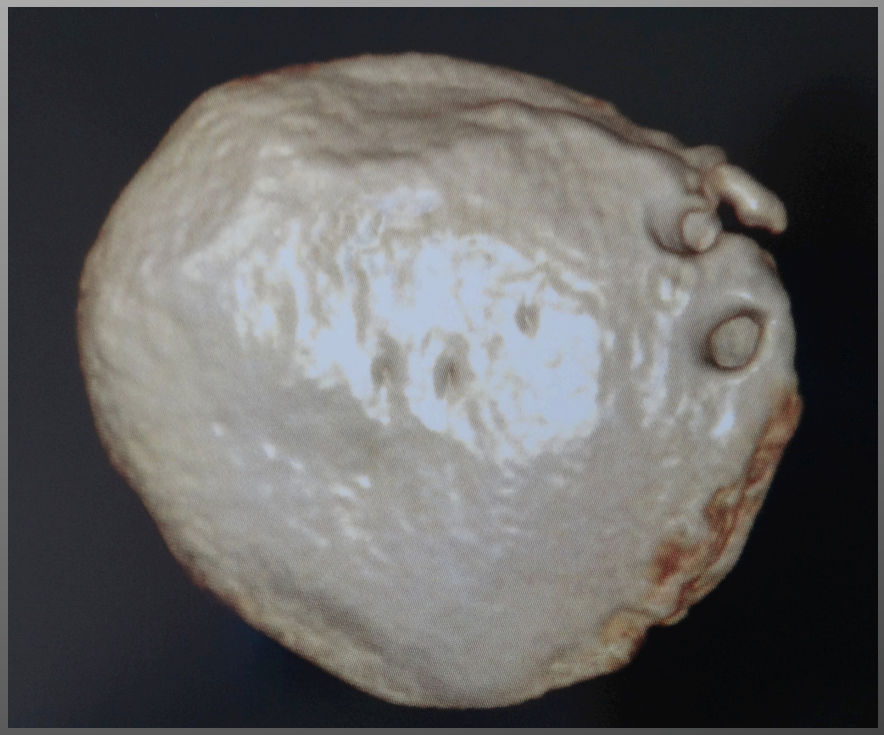
Parikh SN, Wall EJ J Bone Joint Surg Am. 2011

Type 1


Type 2

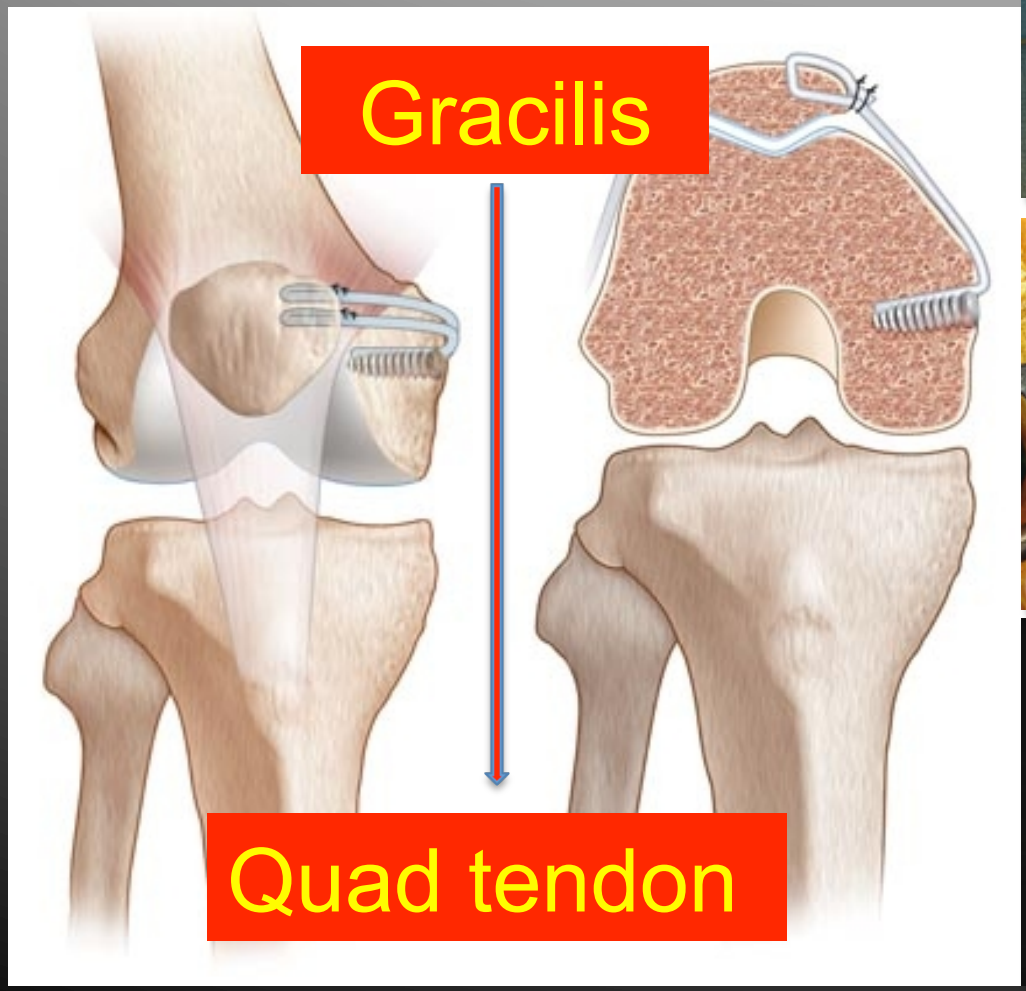


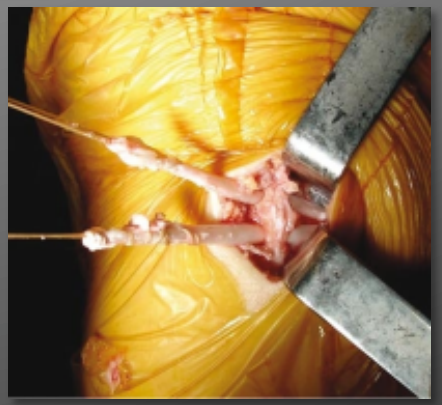
Type 3

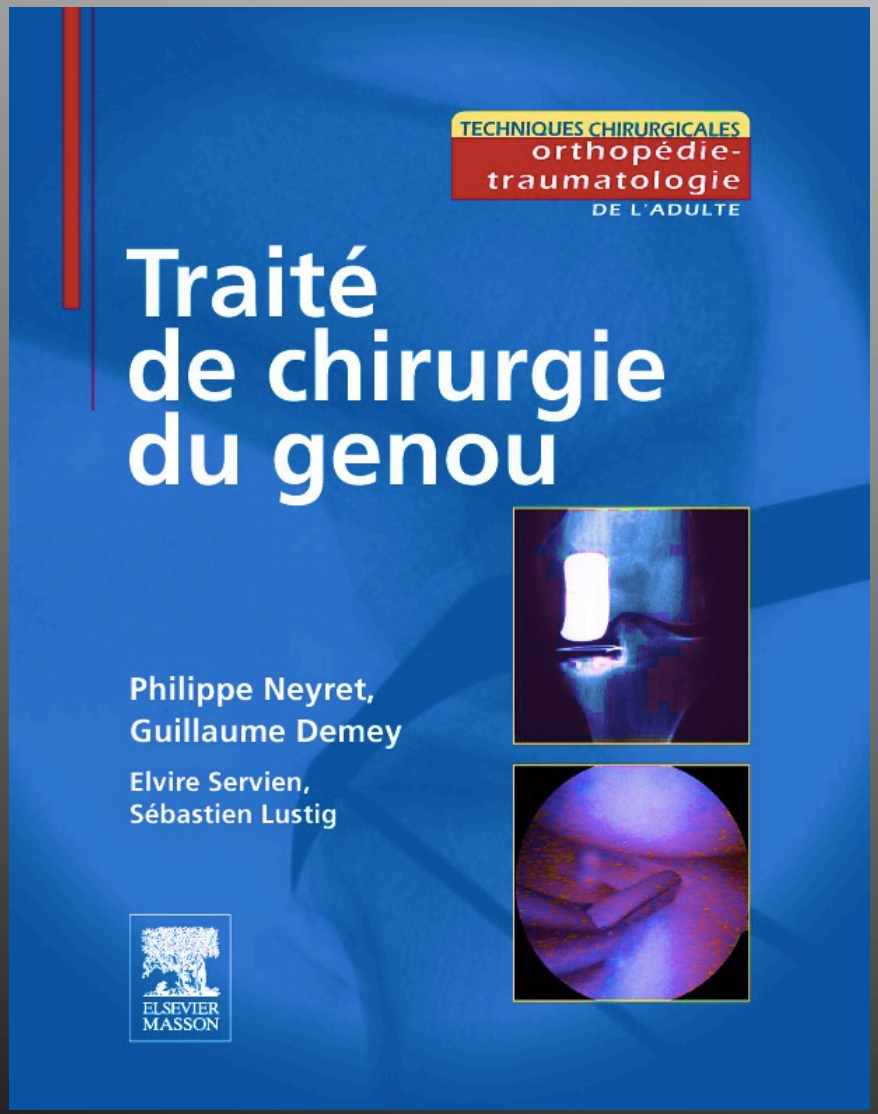


10 of our first 40 cases treatred without osteosynthesis

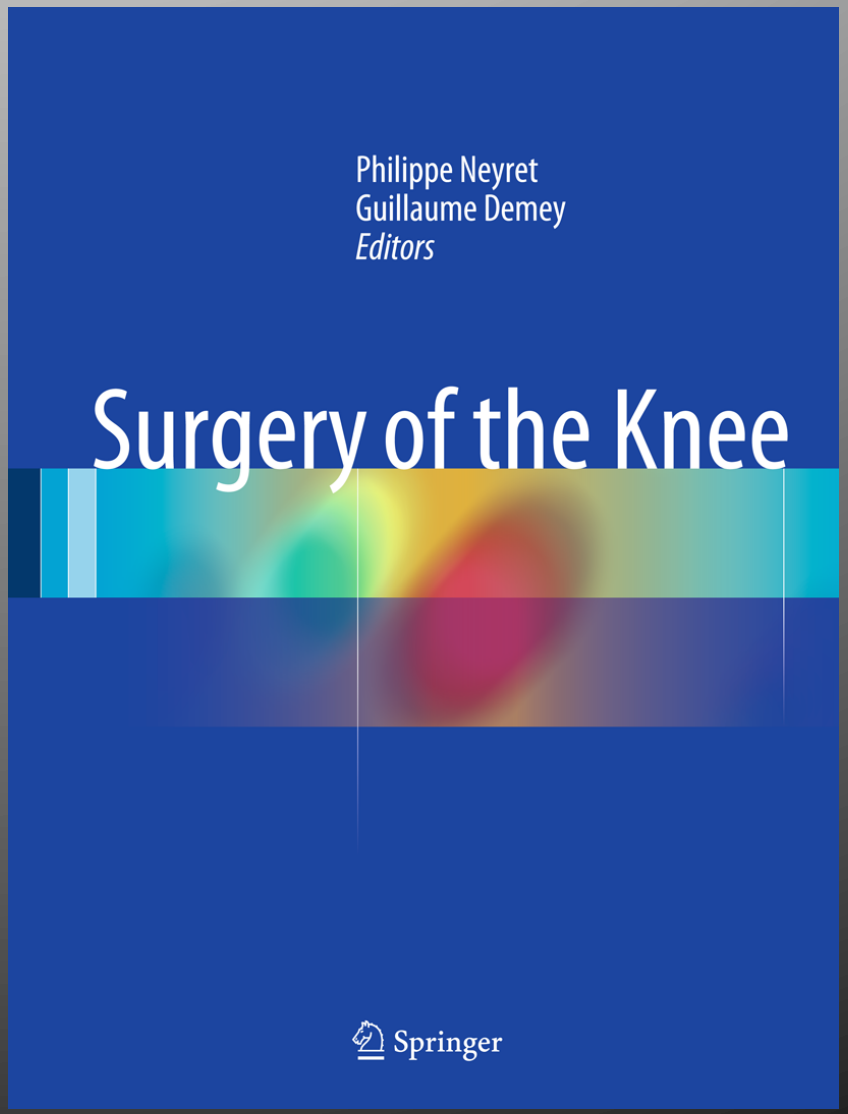
MPFL Reconstruction






TECHNIQUES CHIRURGICALES
orthopédie-traumatologie
DE L'ADULTE
Traité de chirurgie du genou
Philippe Neyret,
Guillaume Demey
Elvire Servien,
Sébastien Lustig
ELSEVIER MASSON

2011


Philippe Neyret
Guillaume Demey
Editors
Surgery of the Knee
Springer

2014


Thank You


11TH BIENNIAL
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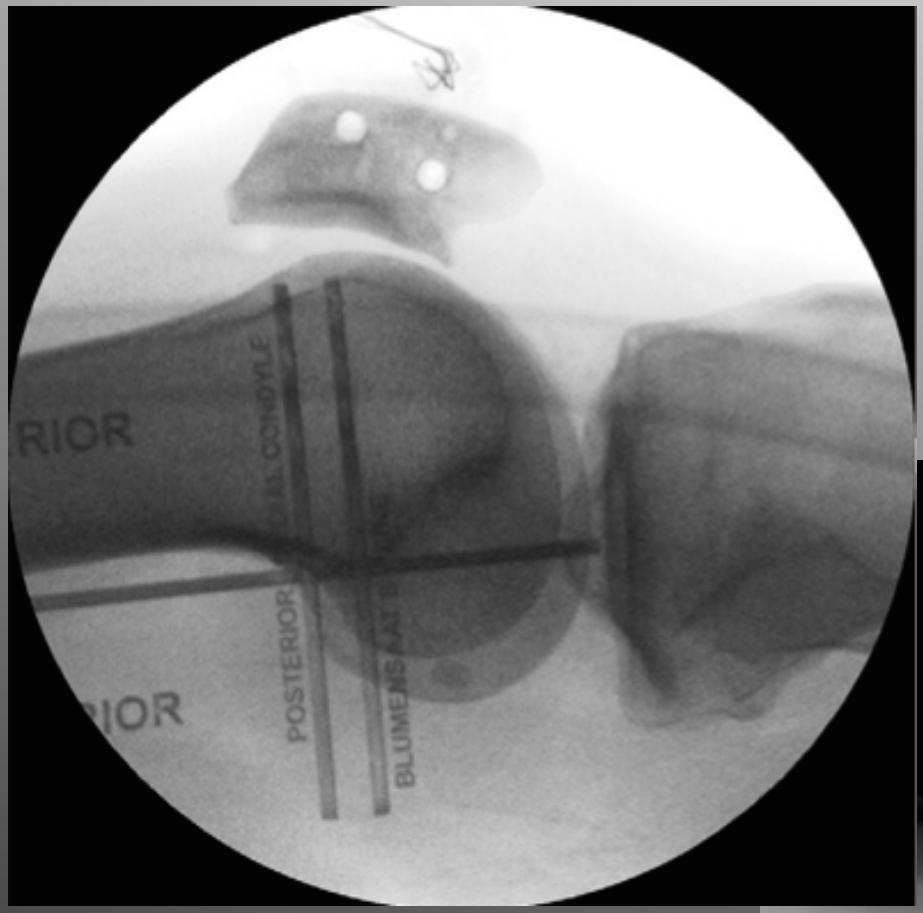
JUNE 4 – 8, 2017 • SHANGHAI, CHINA
2017 上海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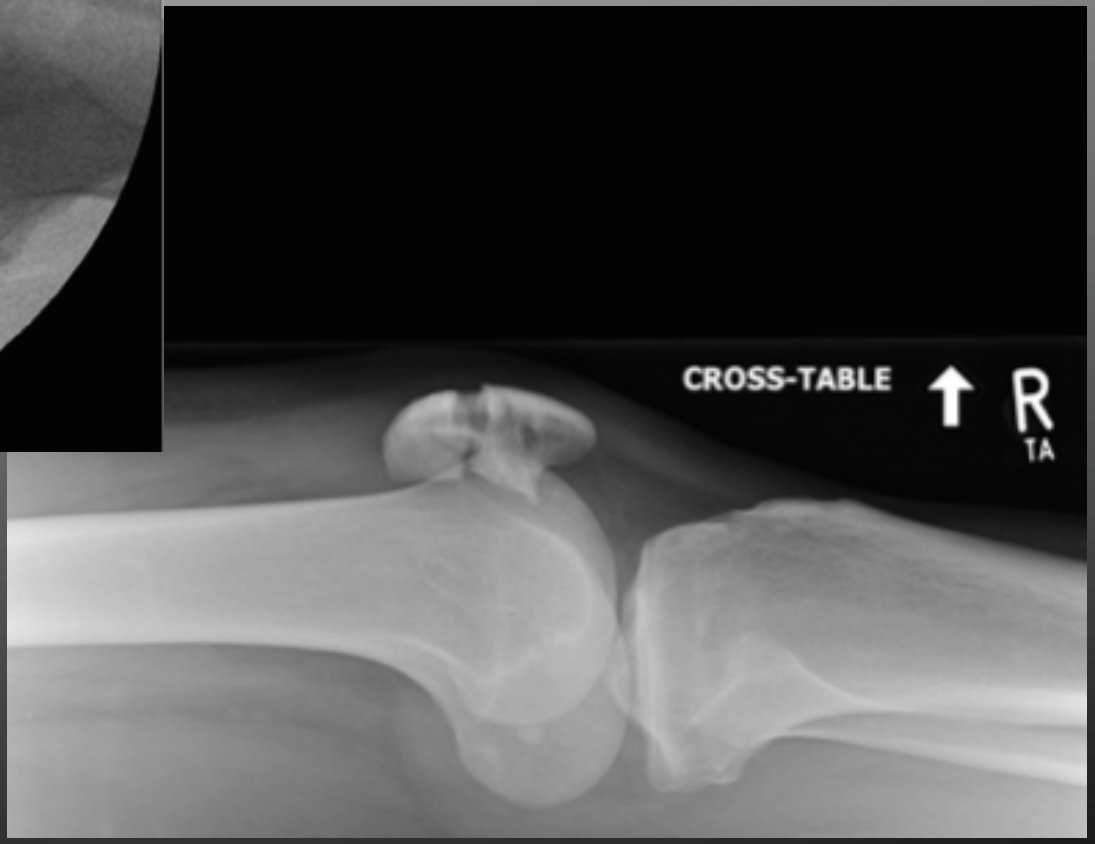
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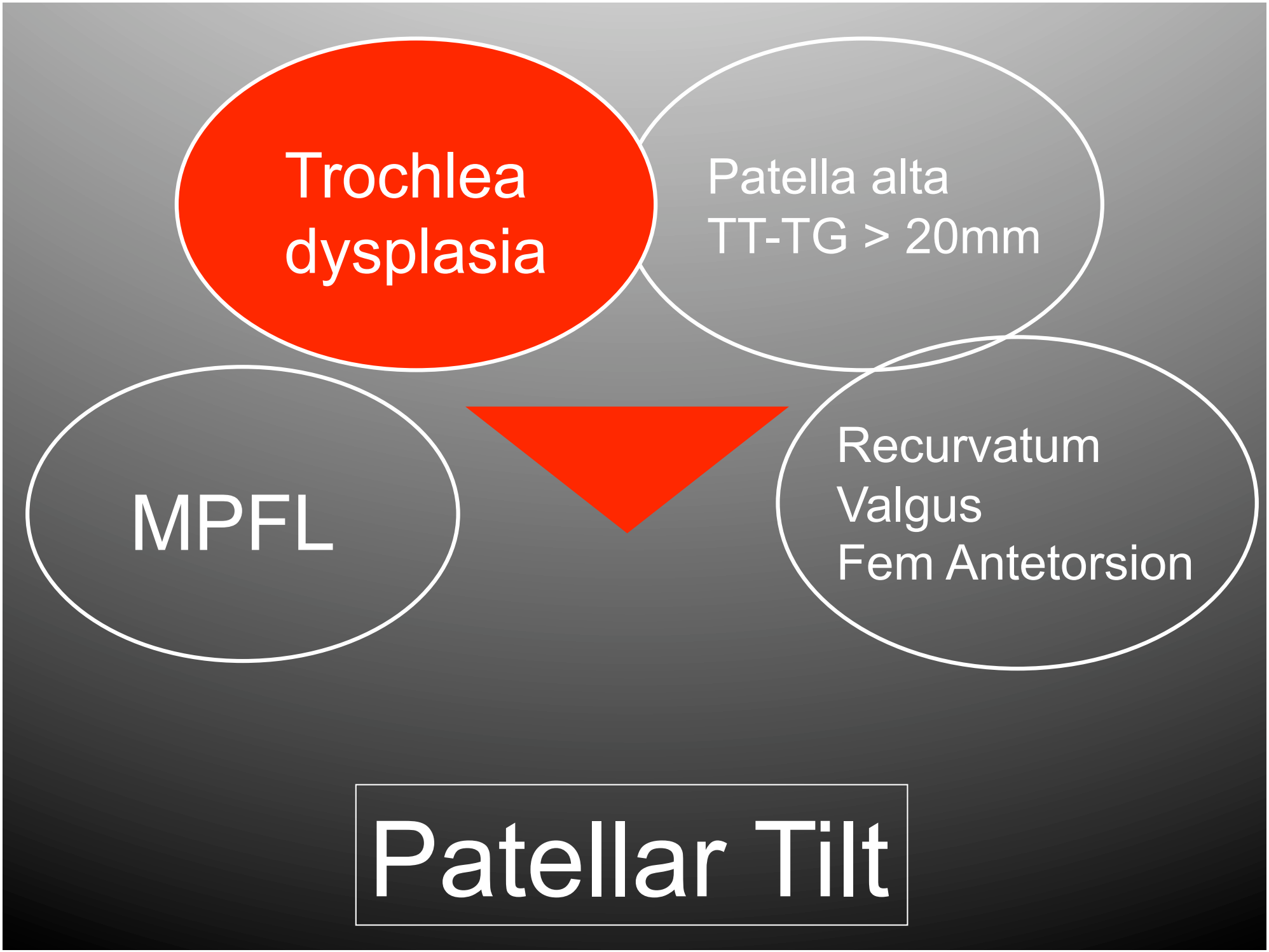
Trochlea dysplasia
Patella alta
TT-TG > 20mm
MPFL
Recurvatum
Valgus
Fem Antetorsion
Patellar Tilt

Complications Trochleoplasty

- Combination of several procedures
- Arthrofibrosis (33% -Donell- to 0°)
- ROM deficit
- Subchondral bone and cartilage dameags
- Progression of PF OA due to PF incongruency?

PF arthroplasty for symptomatic nonunion after trochlear osteotomy for patellar instability: a case report

One patient 33Y

Elevation of the laterla facet of the trochlea

Patellofemoral arthroplasty may be considered a salvage procedure for failed surgical treatment for trochlear dysplasia

Cases J. 2009

van Jonbergen HP, van Egmond K

Cases J. 2009
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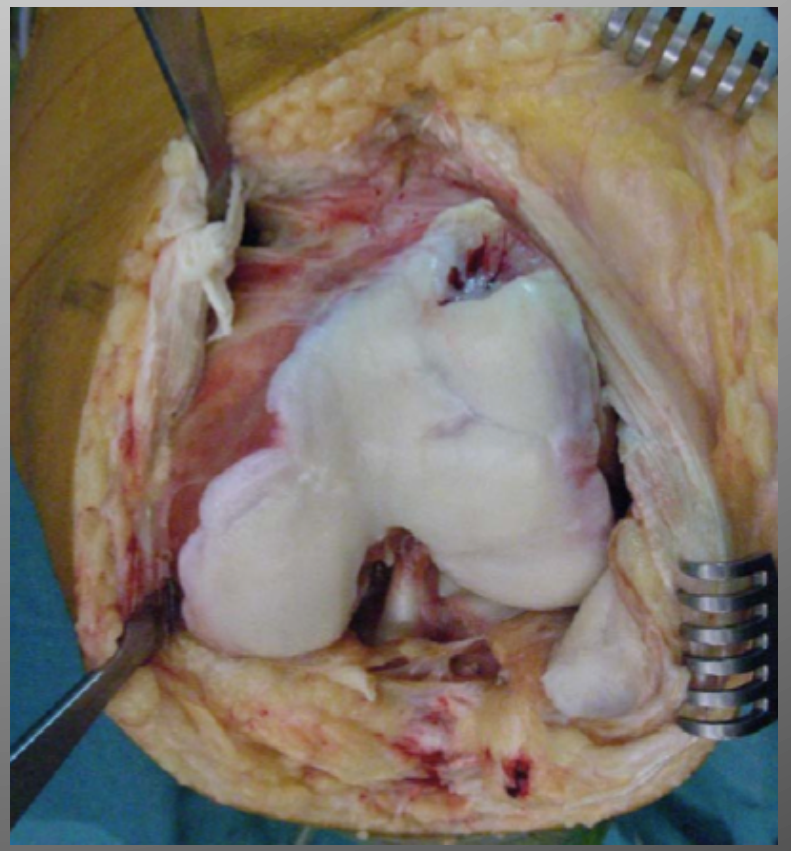
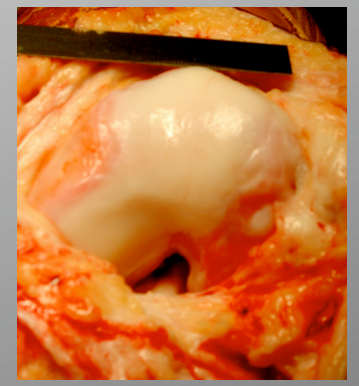
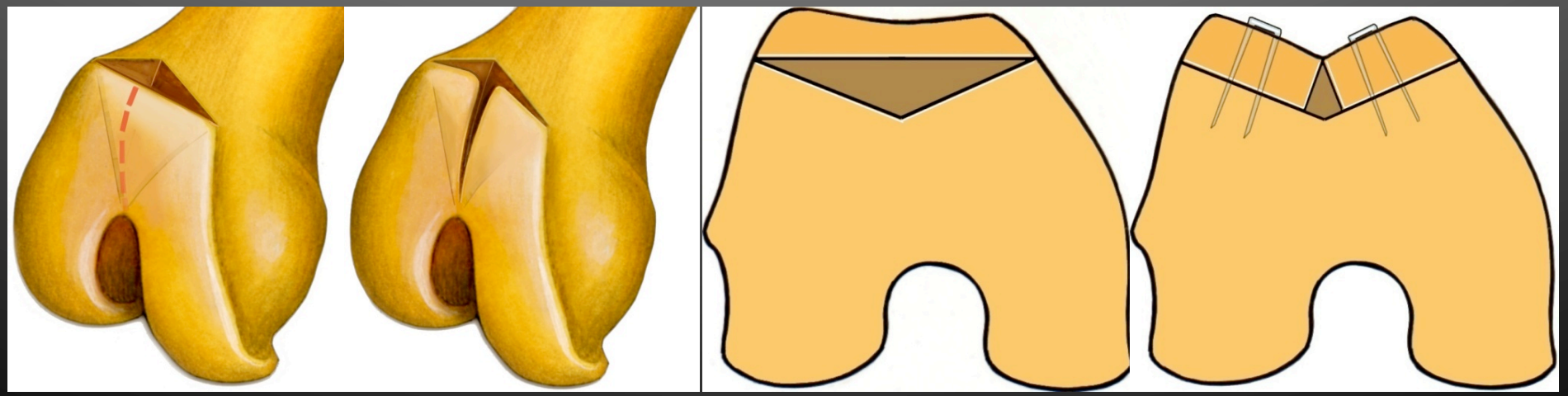


Treatment



- Deepening Trochleoplasty

In our department a deepening trochleoplasty is only indicated severe trochlear dysplasia (with a bump of >6 mm, abnormal patellar tracking or failure of previous surgery)., particluarly in case of recurrence.



The Lyon's sulcus-deepening trochleoplasty

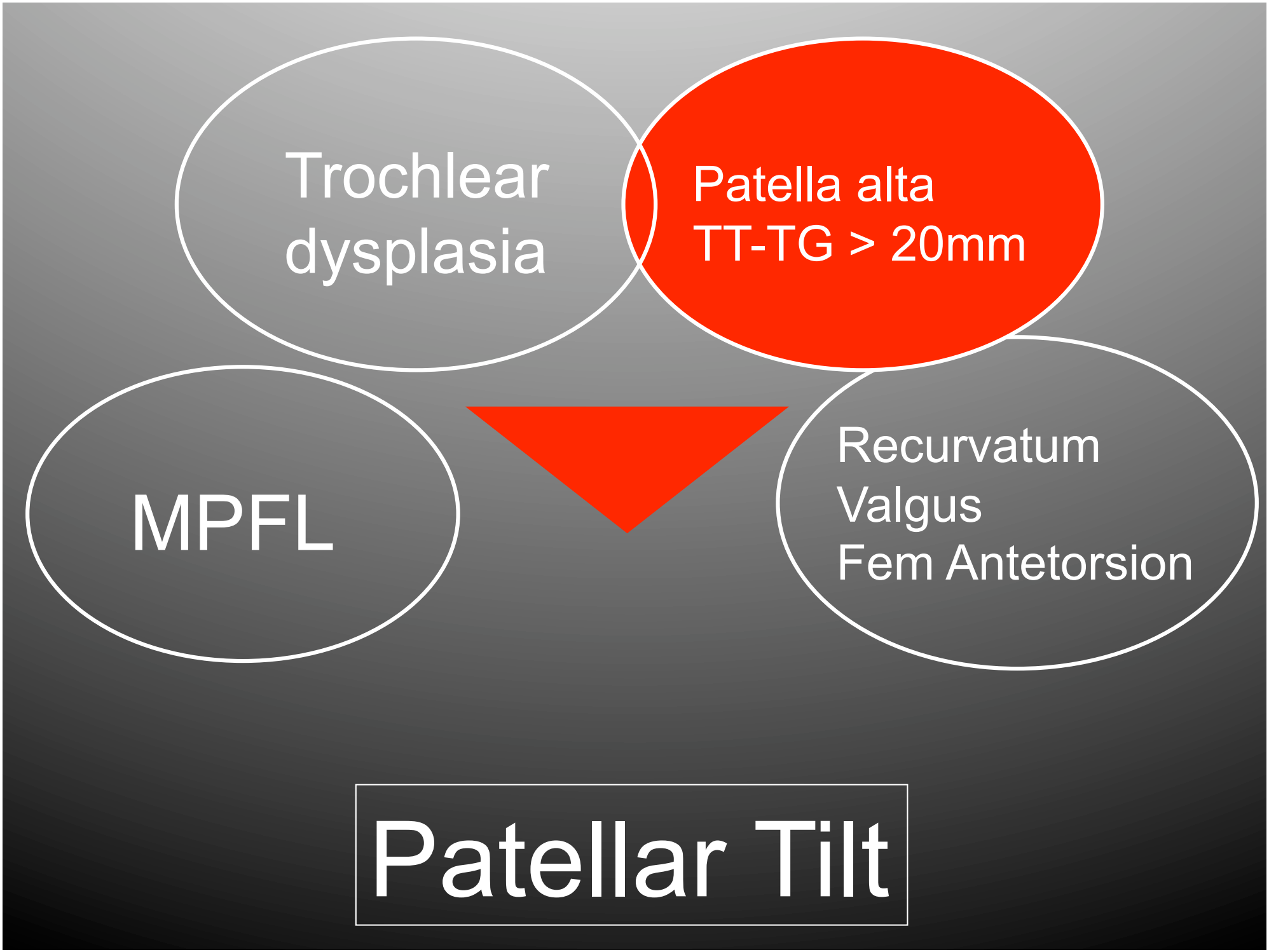
- 24 knees @ 66mths FU (24-191).
- In all: Additional soft-tissue and bony operations

- No patellar re-dislocation
- Pain decreased in 72%
- Negative apprehension in 75% ($p<0.01$)
- No PFOA.

an acceptable revision option if persisting patellar dislocation and high-grade trochlear dysplasia.

Int Orthop. 2013

Dejour D,Byn P, Nitagiopoulos PG.


Trochlear dysplasia
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Complications Tibial Tuberosity Osteotomy

- Neurovascular structures (8 to 9 mm)
- Compartment syndrome
- Tibial fractures (Fulkerson, 0 to 8%); Type of osteotomy, delayed RTS
- ATT fractures, ATT avulsion
- ATT nonunion
- Painful hardware
- DVT
- Arthrofibrosis, patella infera.

RESULTS

N= 130 (174 knees) 1988-1999

FU: 2y-13y N=110

Subjective IKDC: 77.2 (45.9-95.4)

Very Satisfied or Satisfied: 94%

Post-op dislocation: 4.5%

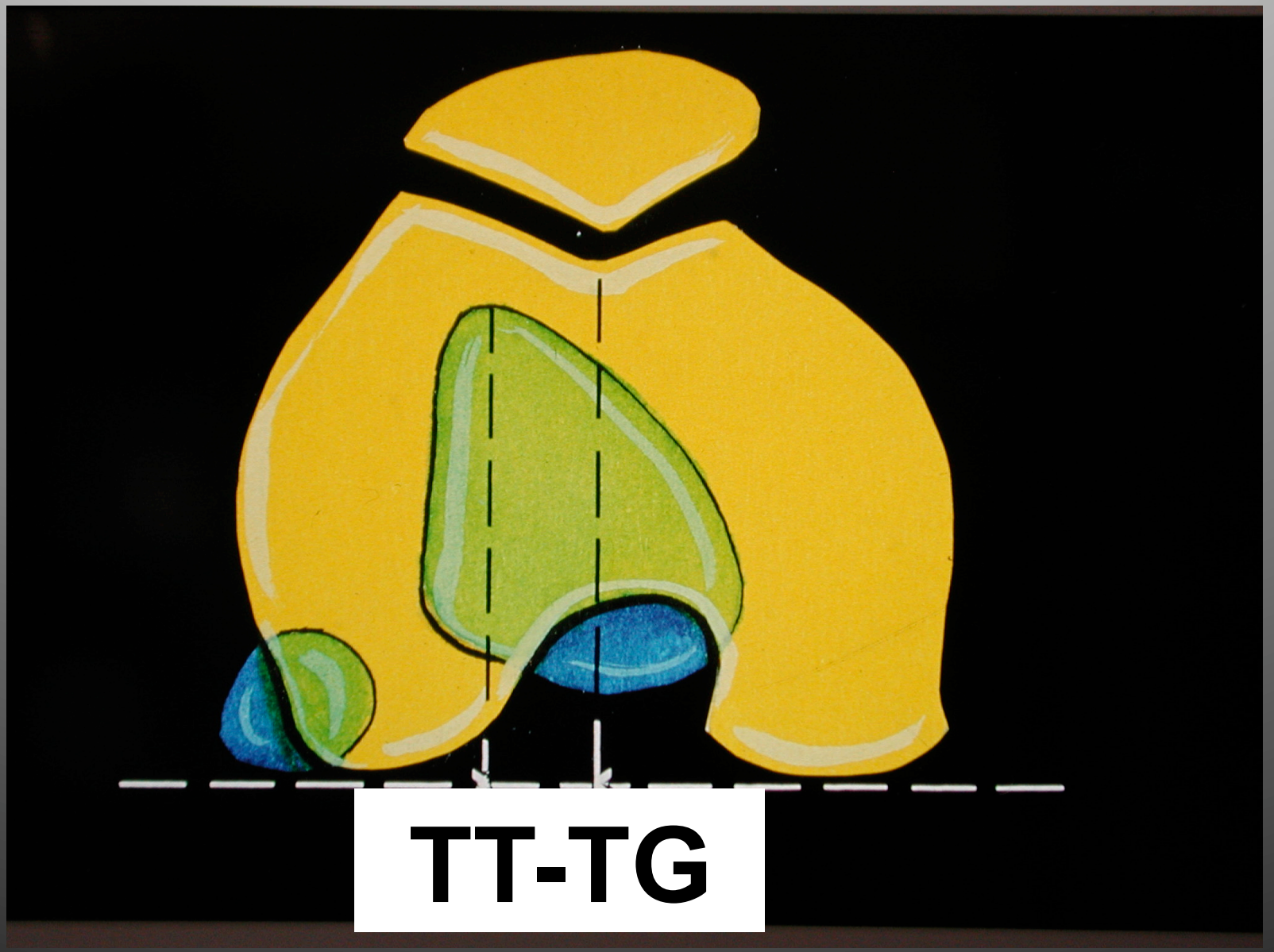
Sports Med Arthrosc. 2007 Jun;15(2):61-7.

Tibial tuberosity transfer for episodic patellar dislocation.

Servien E, Verdonk PC, Neyret P.

Department of Orthopaedic Surgery, Centre Livet, Centre Hospital Universitaire, Lyon, France. elvire.servien@chu-lyon.fr

E. Servien, T Ait Si Selmi, Ph Neyret Subjective evaluation of surgical treatment for patellar instability
Rev Chir Orthop, 2004, 90, 137-142



Bernageau and Goutallier defined the TAGT that measured the lateral implantation of the ATT and external FT rotation

Rev Chir Orthop Reparatrice

[Factors affecting study].

[Article in French]

Lustig S, Servien E, Aït Si

Service de Chirurgie Orthopé

Abstract

PURPOSE OF THE STU TT-TG (tibial tuberosity--

MATERIAL AND METH 1989 and 2002. Objectiv of both knees were exam consecutive TT-TG mea (difference between the p

RESULTS: For the 36 nc difference was significan measured intraoperativel expressed in absolute va with surgically performed

DISCUSSION: For some patellar instability. It mus assessment is however radiographic protocol is r obtained.

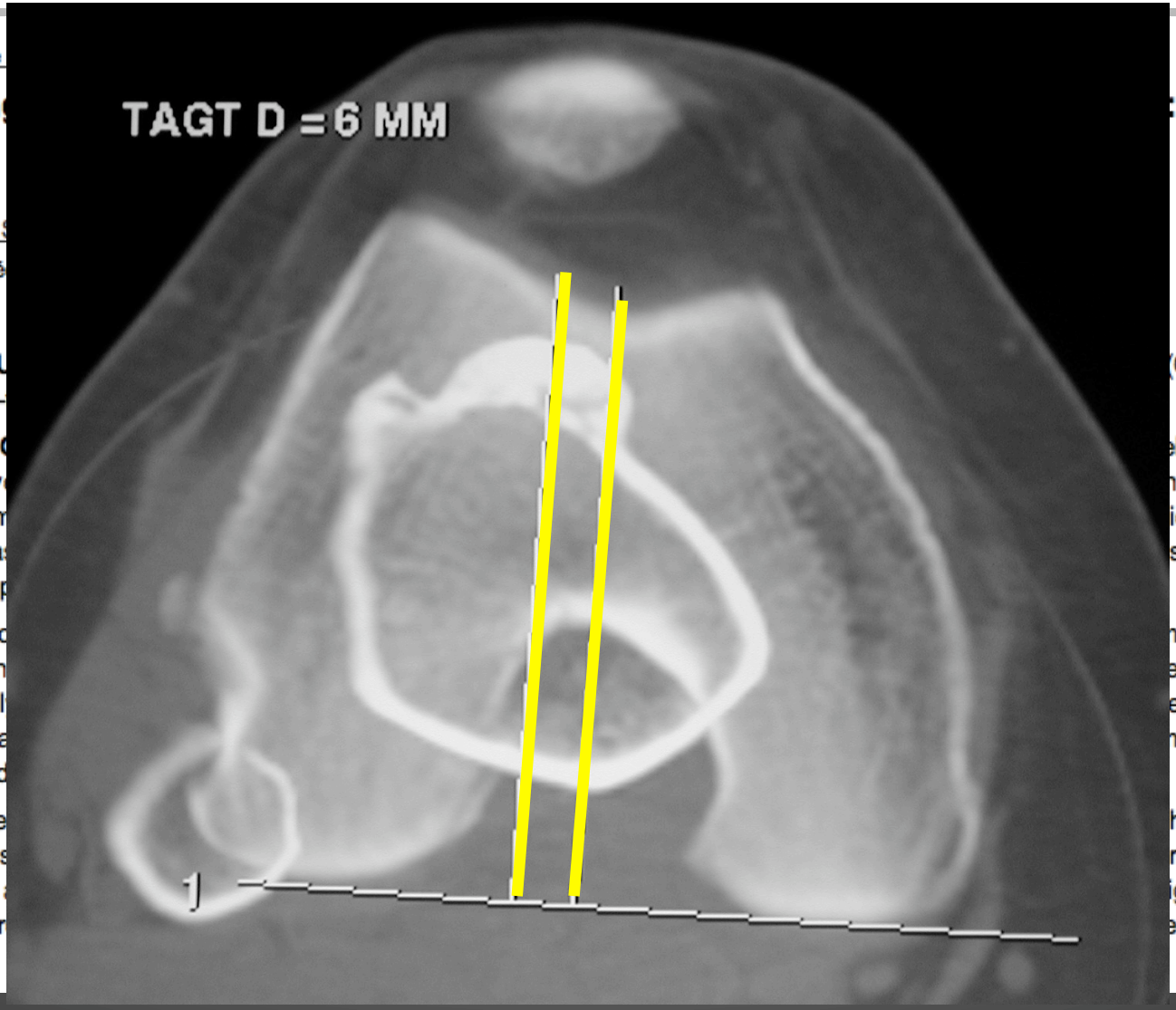
: A CT-scan

(CT) measurements of the

llar instability between nd postoperative CT-scans ied the difference in two surement of medialization

nm (range 0-13 mm). This edialization effectively ent, the difference measurement compared

herapeutic choices for r postoperative igorously applied standard ed and the values



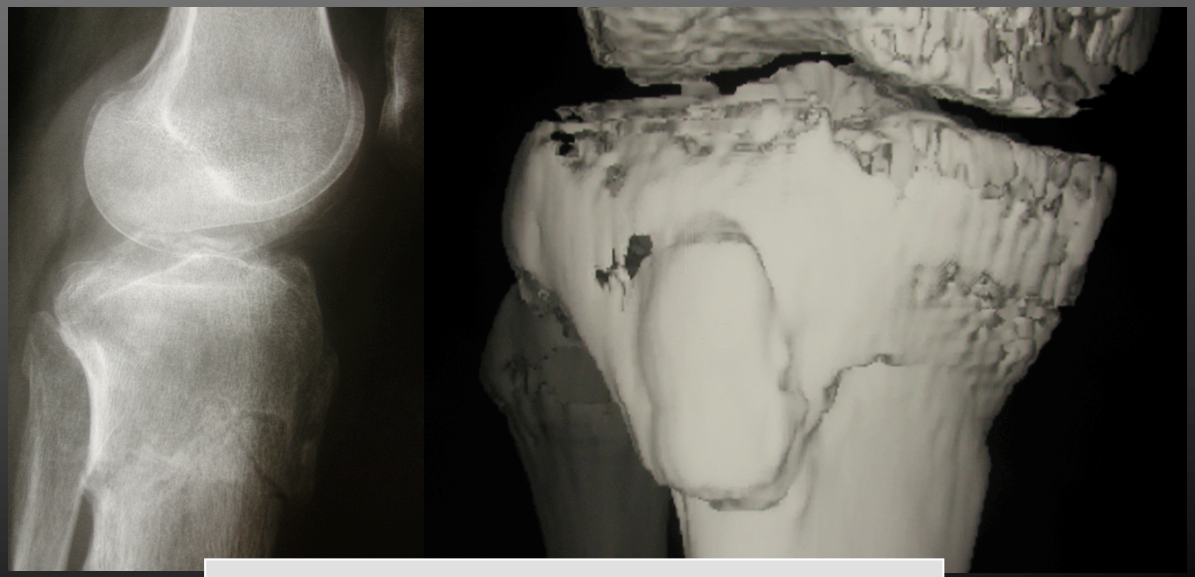
Is TT-TG reliable after medialization of the ATT?

Complications

After ATT osteotomy

- Migration delayed union or non-union
  (screw 2mm longer)
- Fractures of the tibial shaft

TT Osteotomy + 2 months



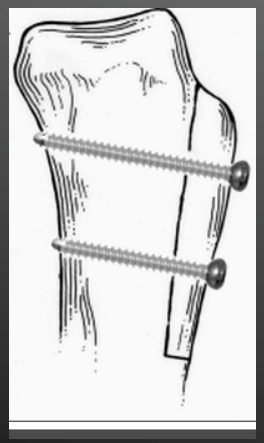
TT Osteotomy + 18 months

Tibial fractures after TTO for patellar instability: a comparison of three osteotomy configurations

- with rigid two-screw, bicortical fixation the complication rate could be lowered to 0%. Avoidance of periosteal stripping, and secondary cortical devascularization at the caudal aspect of the TTO appears to optimize bony consolidation, thereby minimizing fractures.

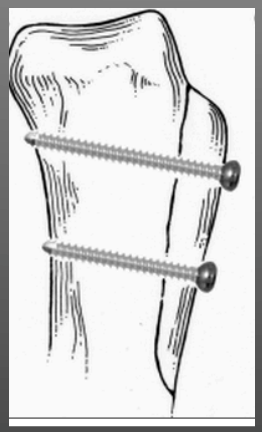
- J Child Orthop. 2011.
- Luhmann SJ, Fuhrhop S, O'Donnell JC, Gordon JE

Subperiosteal stripping of the osteotomy site Transverse plane, at a 90° angle to the anterior tibial cortex (TTO-B)



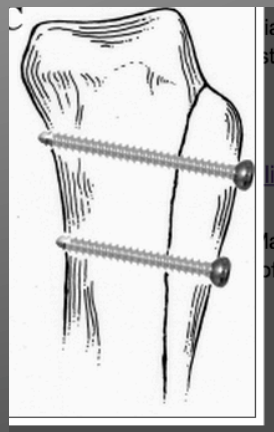
Saw blade

Gradually tapered or sloped to exit the anterior tibia at a less than a 45° angle (TTO-S)



Distal cut of the osteotomy

Osteotome
Without subperiosteal dissection) and without exiting the tibial cortex anteriorly, but by greensticking the anterior tibial cortex (TTO-G).



Osteotome

Patellar Tendon Tenodesis in Association With Tibial Tubercle Distalization for the Treatment of Episodic Patellar Dislocation With Patella Alta

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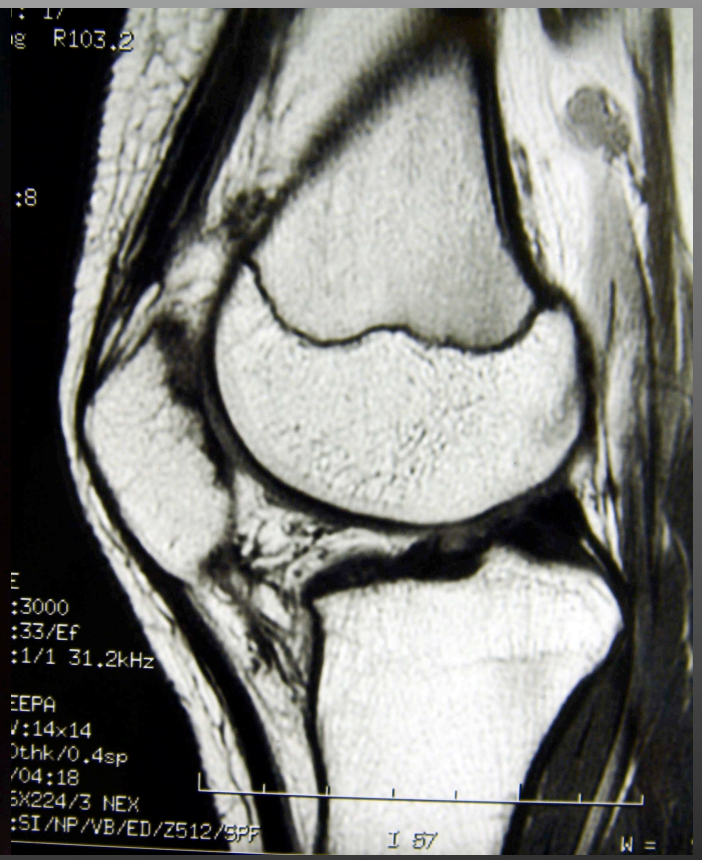
Investigation performed at Hôpital de la Croix-Rousse, Centre Albert Trillat, Lyon, France

Tiall…
1st dislocation 3 YO
Previous operation at 10 YO



Complications LRR

- No longer recommended
- Increased medial patella translation
- Increased lateral patella translation


Niveau 1 : Chirurgie Ambulatoire Orthopédie
Rez de chaussée : Consultation Orthopédie
Bureau des Admissions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Technical failure of MPFL R.

5 patients

IF MPFL is positioned non-anatomically

medial subluxation, medial patellofemoral articular overload, and recurrent lateral instability are possible

led to disabling symptoms and a need for revision surgery.

Strategies to identify the anatomic MPFL insertion during surgery

Arthroscopy. 2011

Bollier M, Fulkerson J, Cosgarea A,Tanaka M

Recurrent patellar dislocation after MPFLR

3 patients

moderate to severe traumatic episode led to 3 P Dislocations including transverse avulsion fracture at the medial rim of the patella

All three were treated by an open reduction and internal fixation

No complication or recurrent dislocations occurred

underlying pathology

weak area results from the previous drill holes, which act as stress risers.

KSSTA 2008 **Thaunat M, Erasmus PJ**

Patellofemoral arthroplasty for symptomatic nonunion after trochlear osteotomy for patellar instability: a case report

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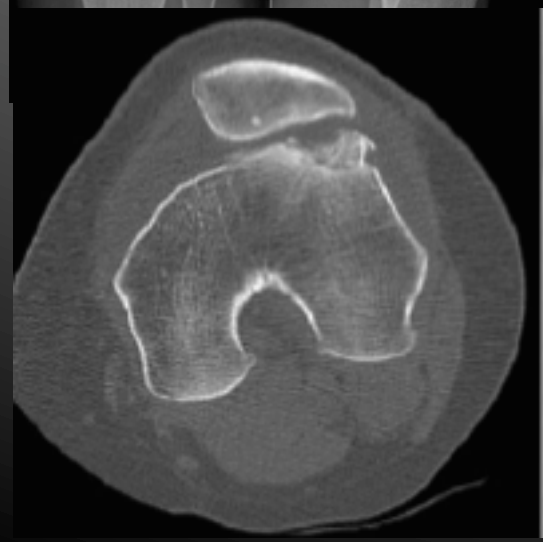

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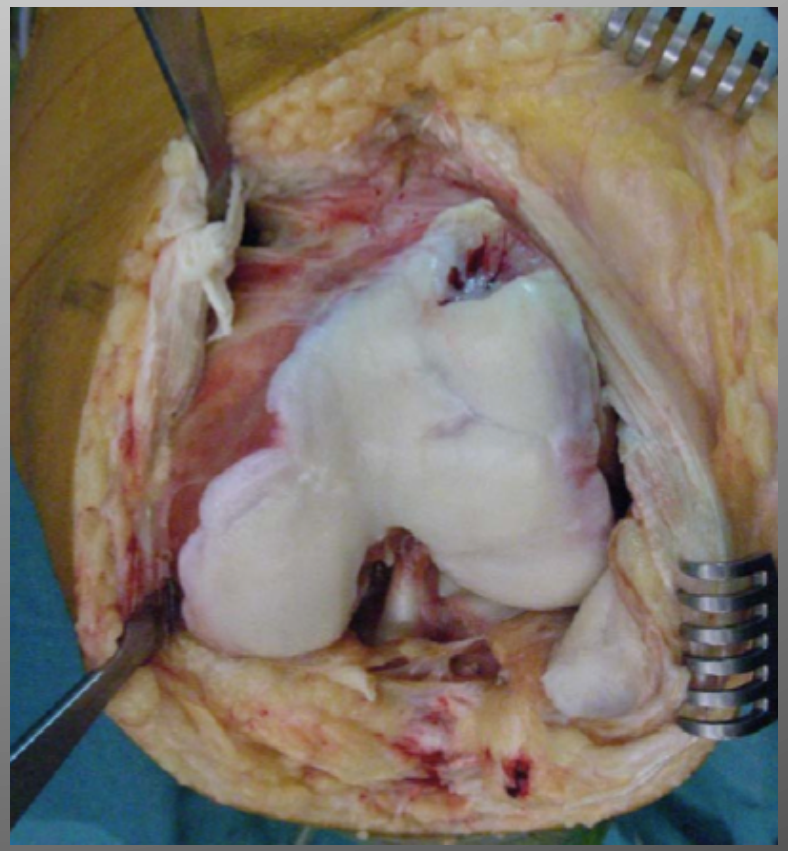

CONCLUSION

- Preventing widening by
  - Optimal femoral tunnel positionning : fluoroscopy
  - ATT distalization when needed
- No role of trochlea dysplasia ?

ATT distal transfer

AJSM PreView, published on November 22, 2011 as doi:10.1177/0363546511427117

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Investigation performed at Hôpital de la Croix-Rousse, Centre Albert Trillat, Lyon, France

Femoral Tunnel Enlargement After Medial Patellofemoral Ligament Reconstruction

Prevalence, Risk Factors, and Clinical Effect

Jean-Baptiste Berard,* MD, Robert A. Magnussen,†‡ MD, Soner Ozcan,§ MD, Grégoire Bonjean,* MD, Sebastien Lustig,* MD, PhD, Philippe Neyret,* MD, and Elvire Servien,* MD, PhD [AQ: 1]

Investigation performed at Hôpital de la Croix-Rousse, Lyon, France

AJSM 2014

ATT distal transfer

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AJSM 2014

RESULTS

n=55

- Femoral Tunnel Positioning

Normal Group	Widened Group
optimal : 66 %	optimal : 56 %
non optimal: 34 %	non optimal: 44 %

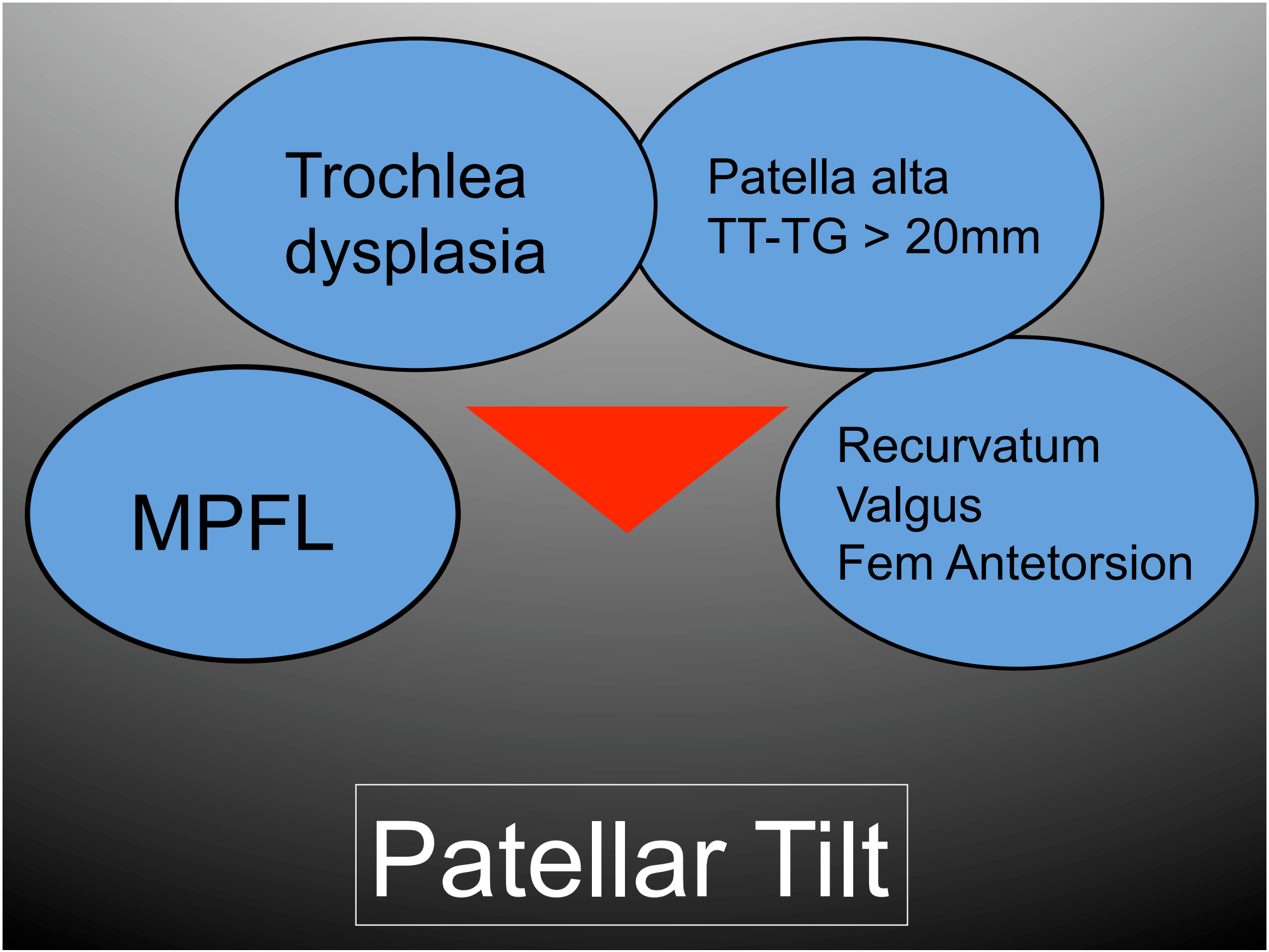
More malpositioned tunnel in widened group p=0.05

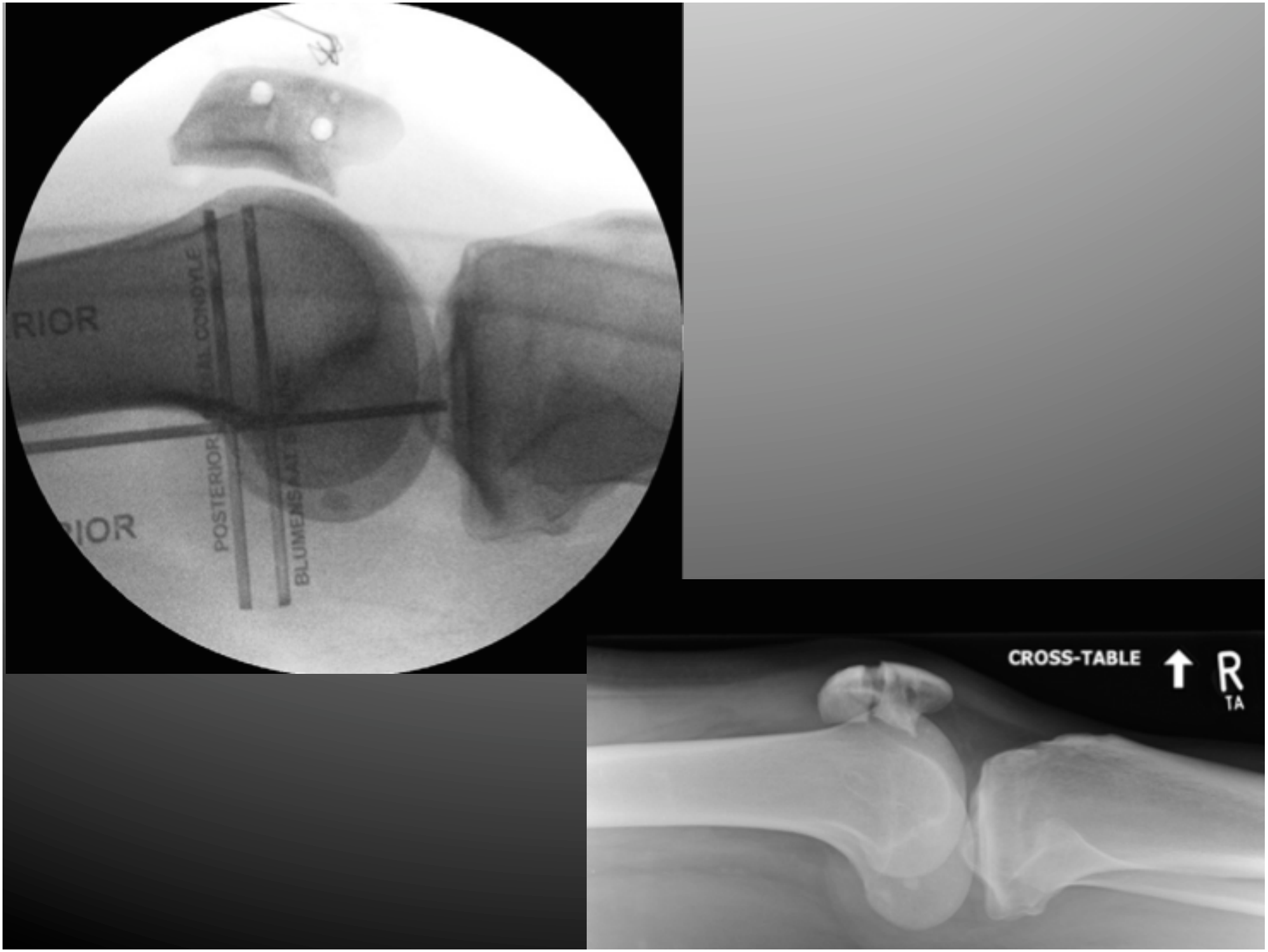
Analysis of failed surgery for patellar instability in children with open growth plates

37 patients

with recurrent patellofemoral instability after unsuccessful Roux-Goldthwait procedure, lateral release, medial reefing or in combination

Trochlear dysplasia seems to be a major risk factor for failure of operative stabilization of recurrent patellofemoral instability in children and adolescents. The results in children are in consensus with the literature in adults that a more tailored operative therapy including reconstruction of the MPFL and trochleaplasty has to be considered


Trochlea dysplasia
Patella alta
TT-TG > 20mm
MPFL
Recurvatum
Valgus
Fem Antetorsion
Patellar Tilt


RIOR
IOR
POSTERIOR
BLUMENSAAT
CROSS-TABLE
R
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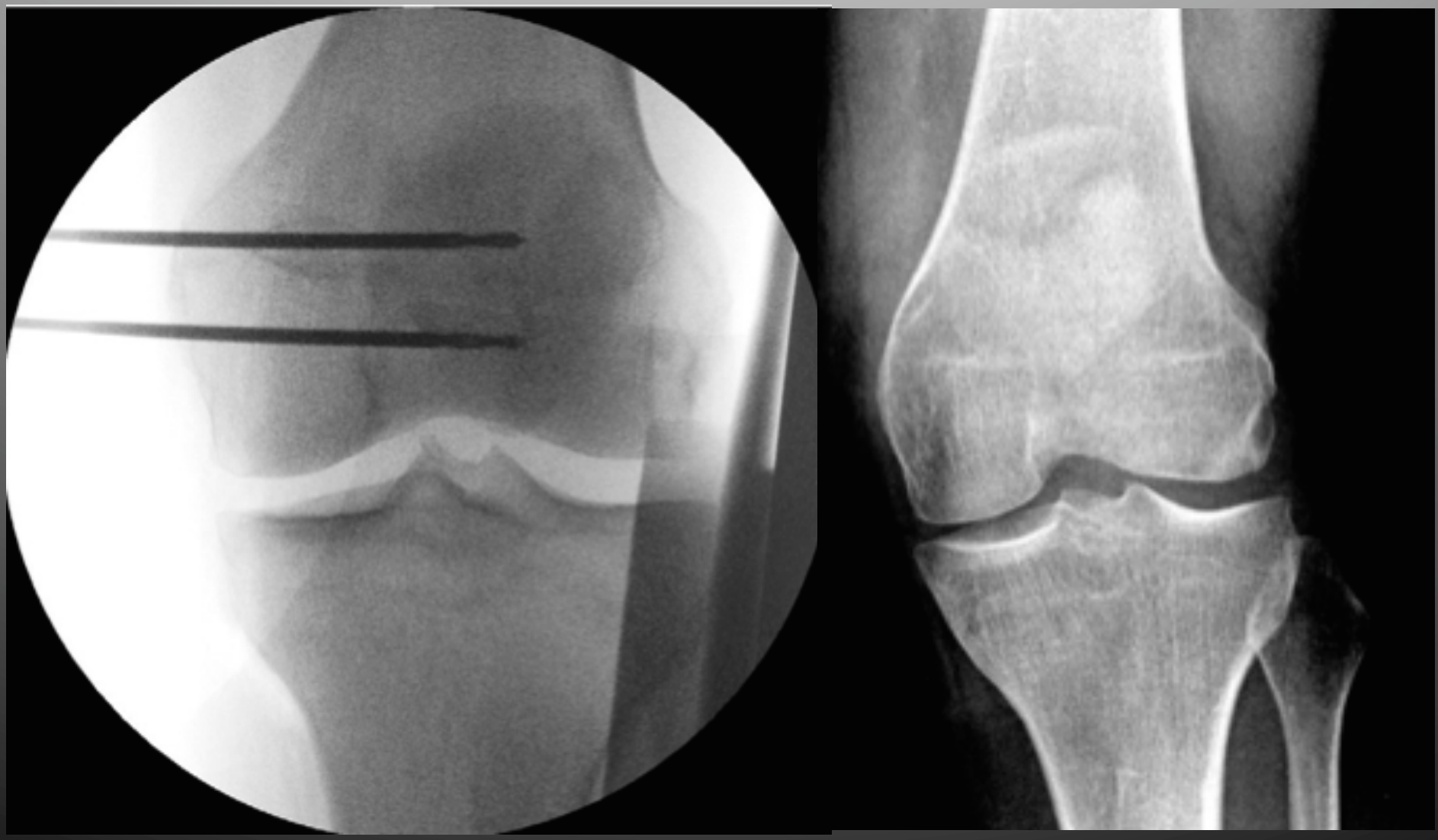


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