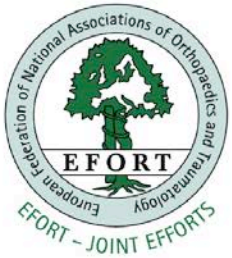
2013

La dysplasie de Trochlée

Diagnostic et CAT

Professeur Philippe Neyret
Docteur V Lafontan
Professeur E Servien
Lyon France

UNIVERSITY TEACHING CENTER



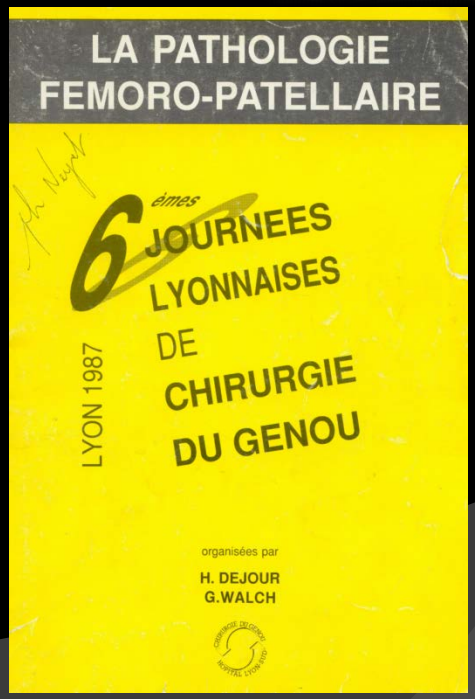
A Trillat

H Dejour

G Walch

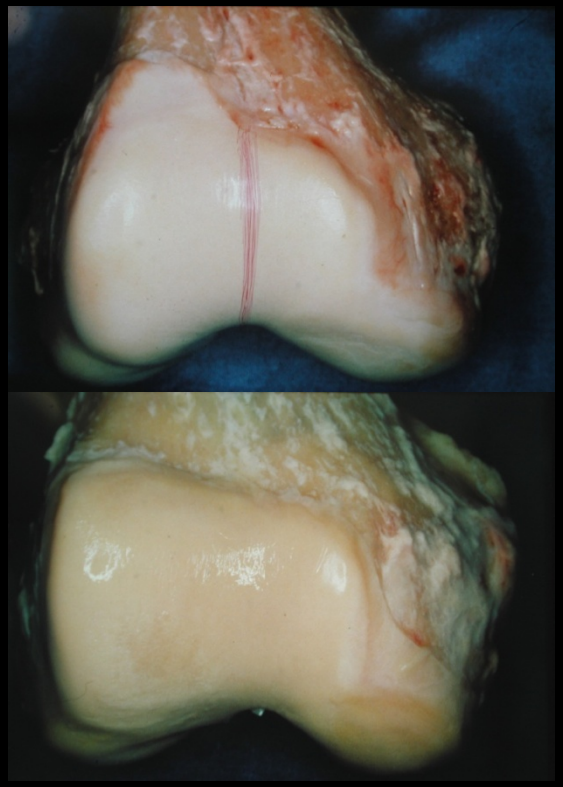
Ledeuil'Thesis

1959



1987

ANATOMIE



Garron E, Jouve JL, Tardieu C, Panuel M, Dutour O, Bollini C
Anatomic study of the patellar groove in the fetal period
Rev Chir Orthop , 2003, 89(5): 407-12

DIAGNOSTIC

90’

Malghem J, Maldague B
Apport du cliché de profil du genou dans le dépistage des instabilités rotuliennes. Rapport préliminaire
Rev Chir Orthop 1985 71. Suppl II, 5-15

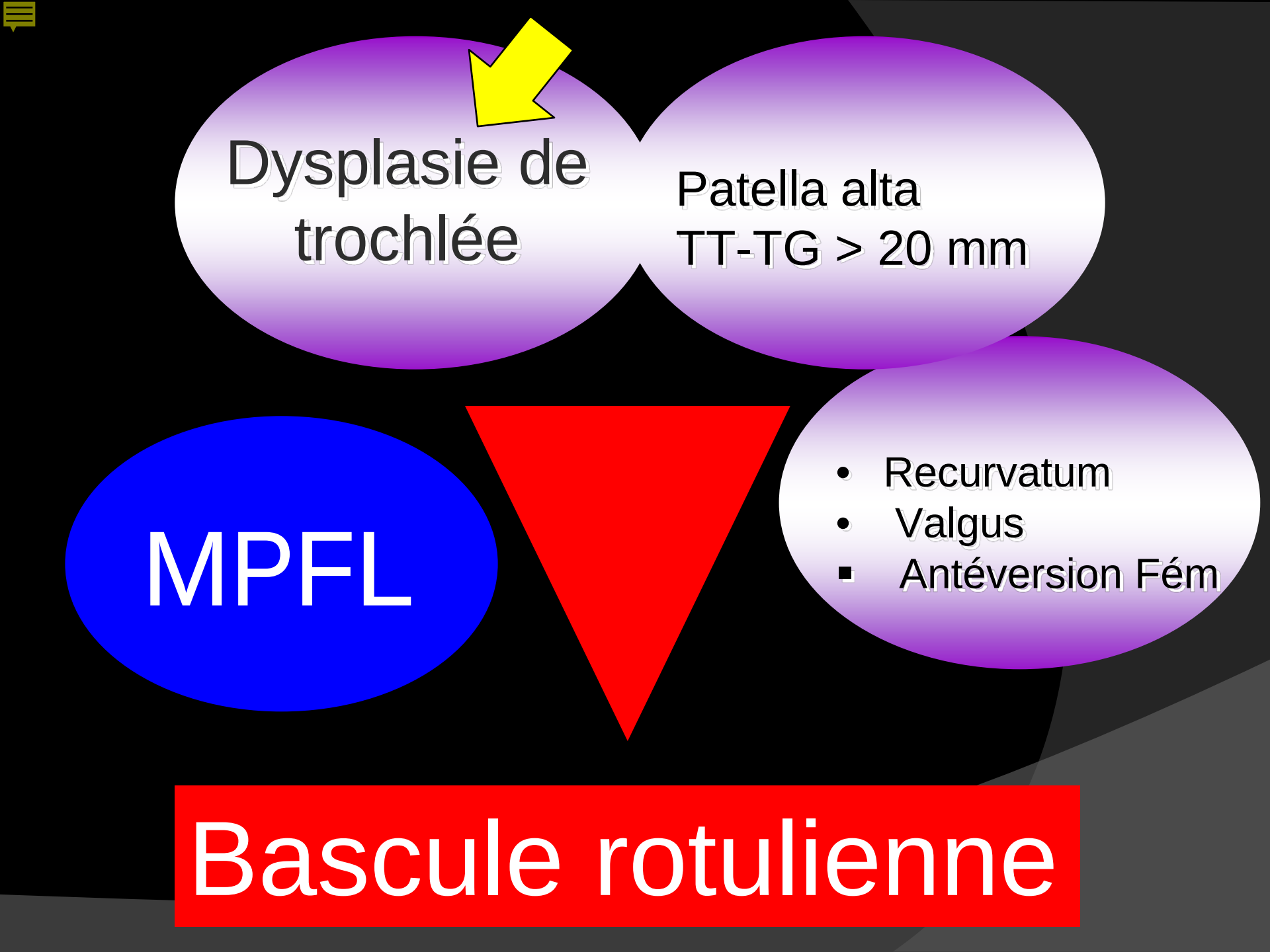
Dejour H, Walch G, Neyret P, Adeleine P
La dysplasie de trochlée
Rev Chir Orthop 1990, 76 : 45-54

Dejour H, Walch H, Neyret P, Adeleine P
Dysplasia of the intercondylar notch
French J. Orthop.Surg 1990, 4 : 113-122

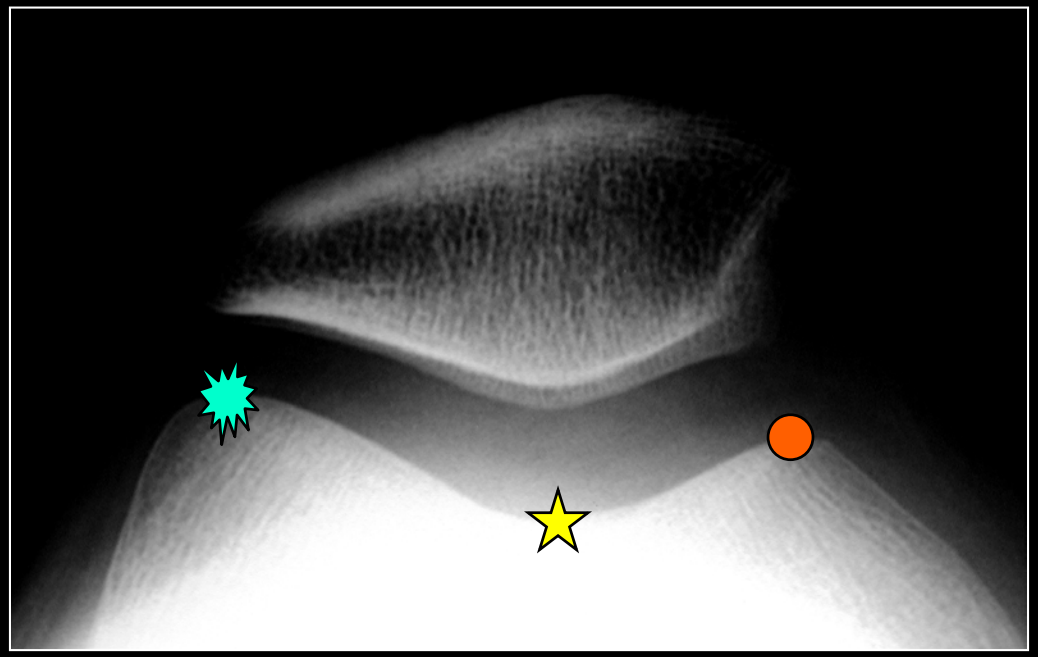
DIAGNOSTIC récent

Fithian D, Neyret P, Servien E
Patella instability: The Lyon experience
Techniques Knee Surgery, 2007, 6,112-123

Malghem J, Maldague B, Lecouvet F, Kouraïssoff S,
vande Berg B
Plain radiography of he knee: the articular surfaces
J Radiol, 2008, 89(5): 692-7

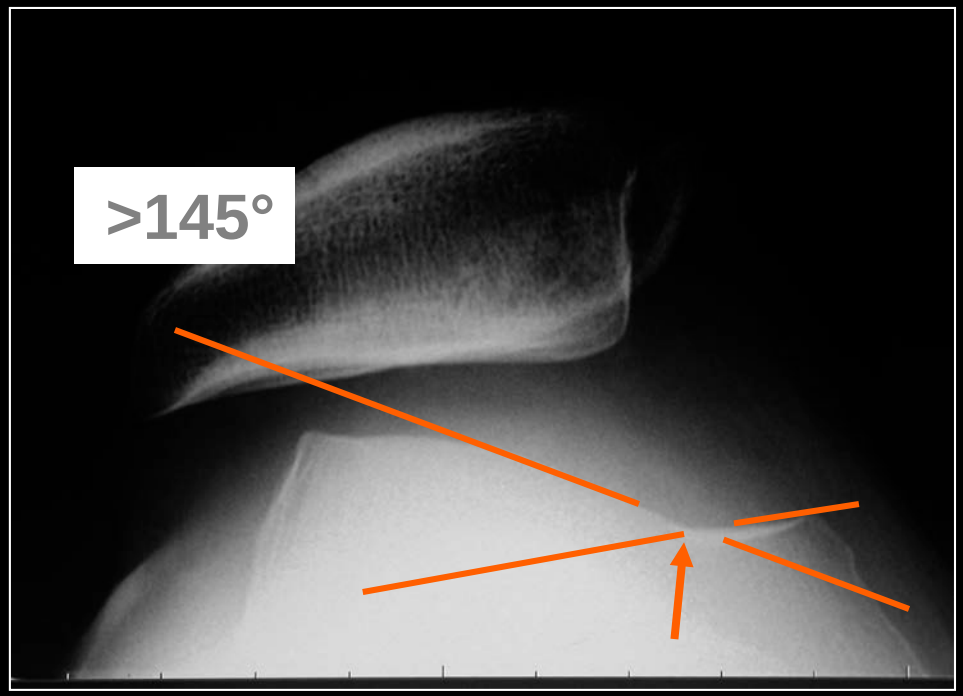

Dysplasie de trochlée
Patella alta
TT-TG > 20 mm
MPFL
Recurvatum
Valgus
Antéversion Fém
Bascule rotulienne

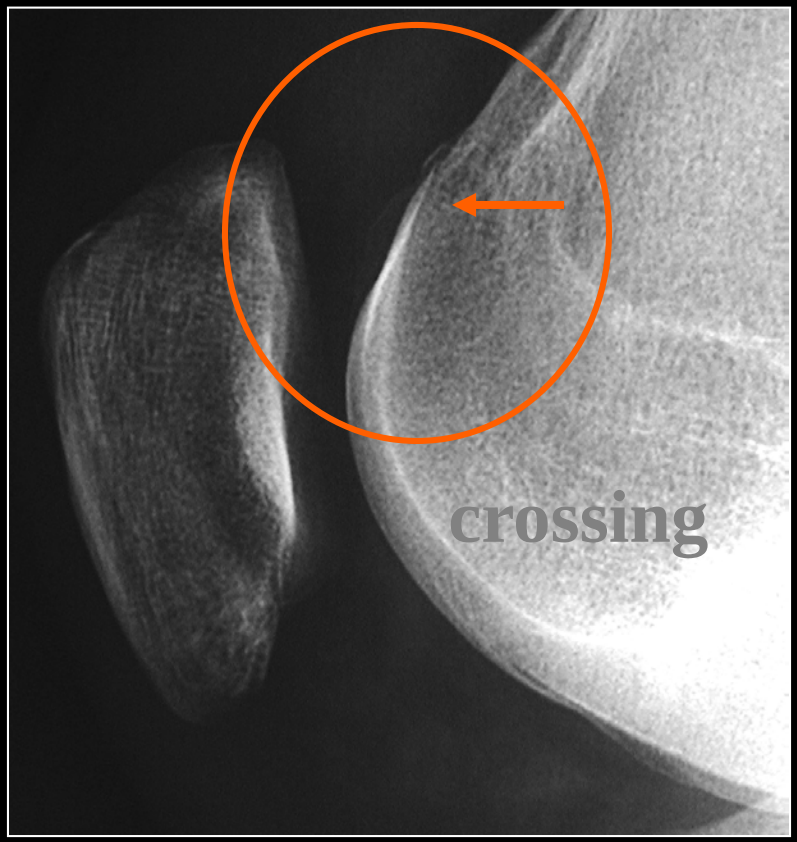
- Trochlée normale



- Trochlée dysplasique

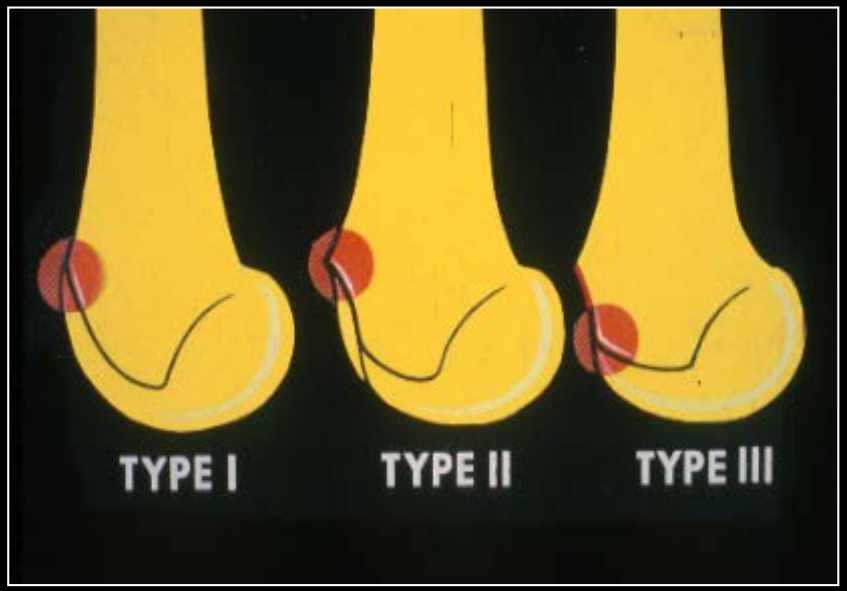
Radios



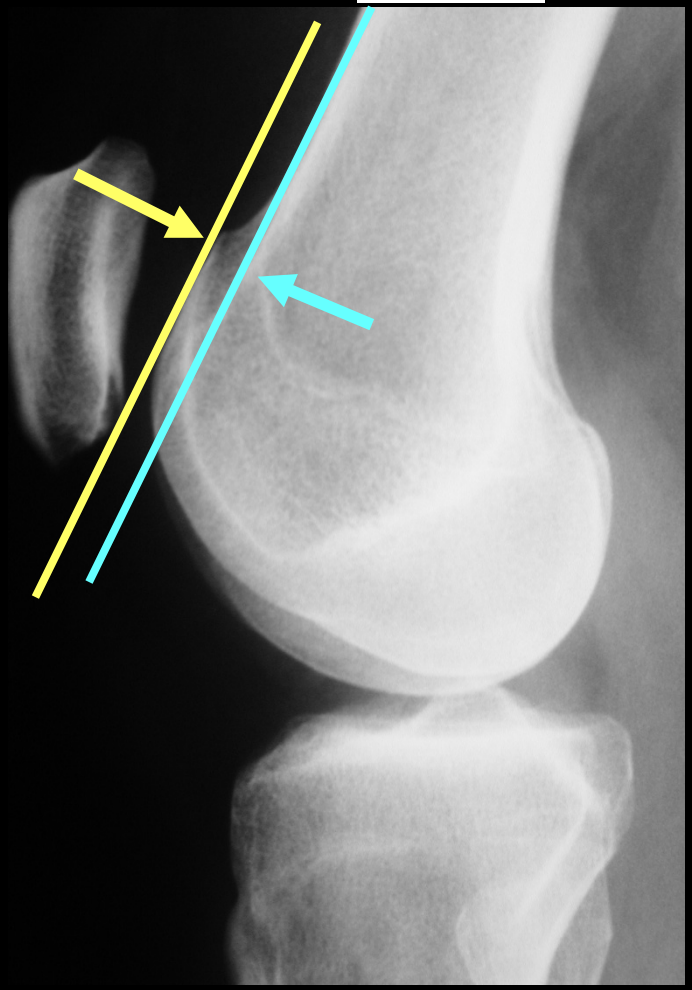


- Trochlée dysplasique

Le signe du croisement est présent dans 96% des cas dans le groupe luxation épisodique et seulement 3% dans le groupe controle



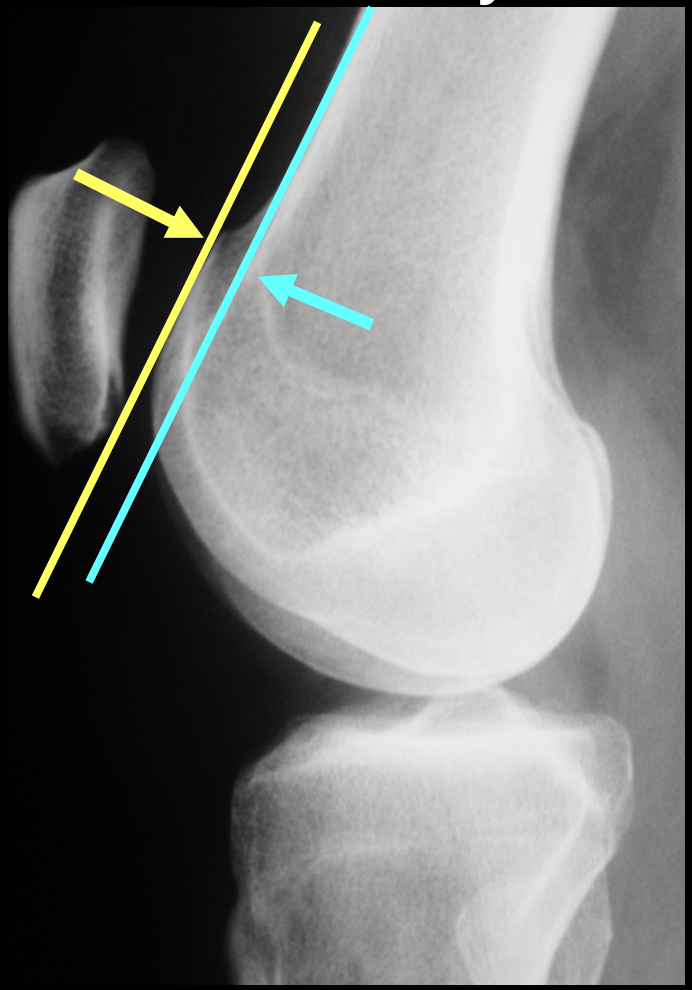
- Trochlée dysplasique



La saillie est définie par la distance séparant la tangente à la corticale antérieure et la parallèle passant par le point le plus antérieur du fond de la trochlée.

- Trochlée dysplasique

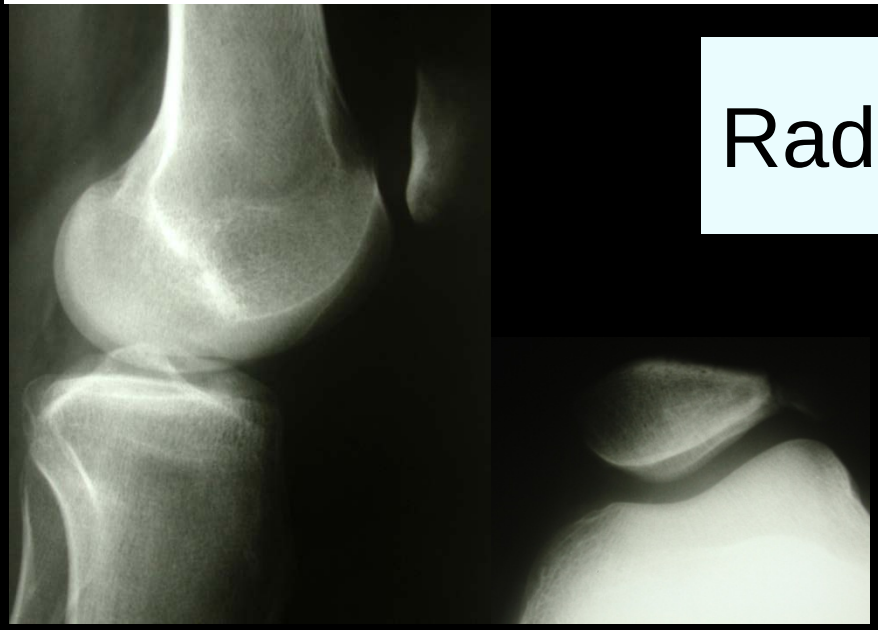
La valeur moyenne de la saillie est de 3,2 mm dans le groupe luxation épisodique de la rotule et de – 0,8mm dans le groupe controle



Valeur seuil
Normal < 3mm

- Trochlée dysplasique

Radios

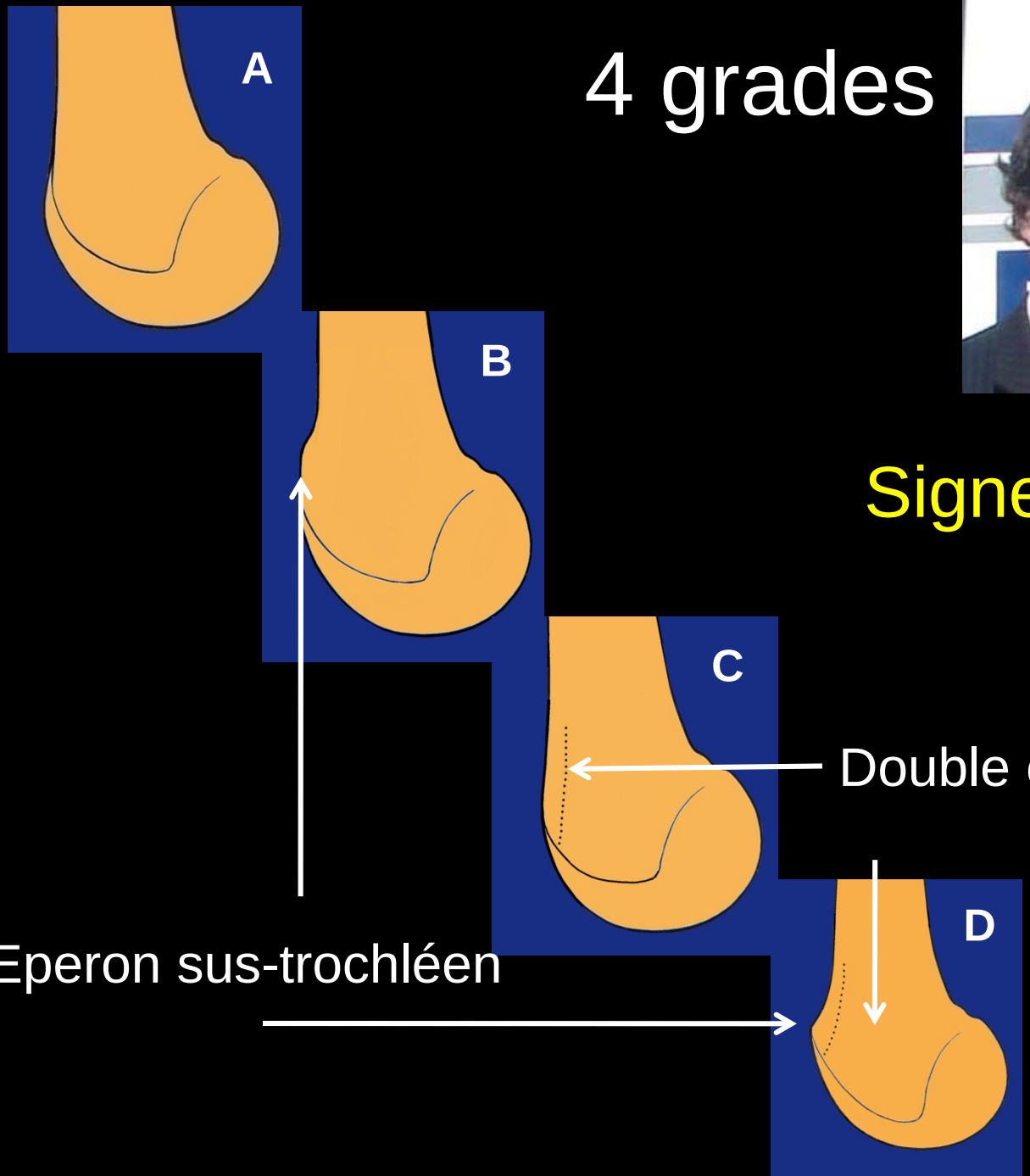


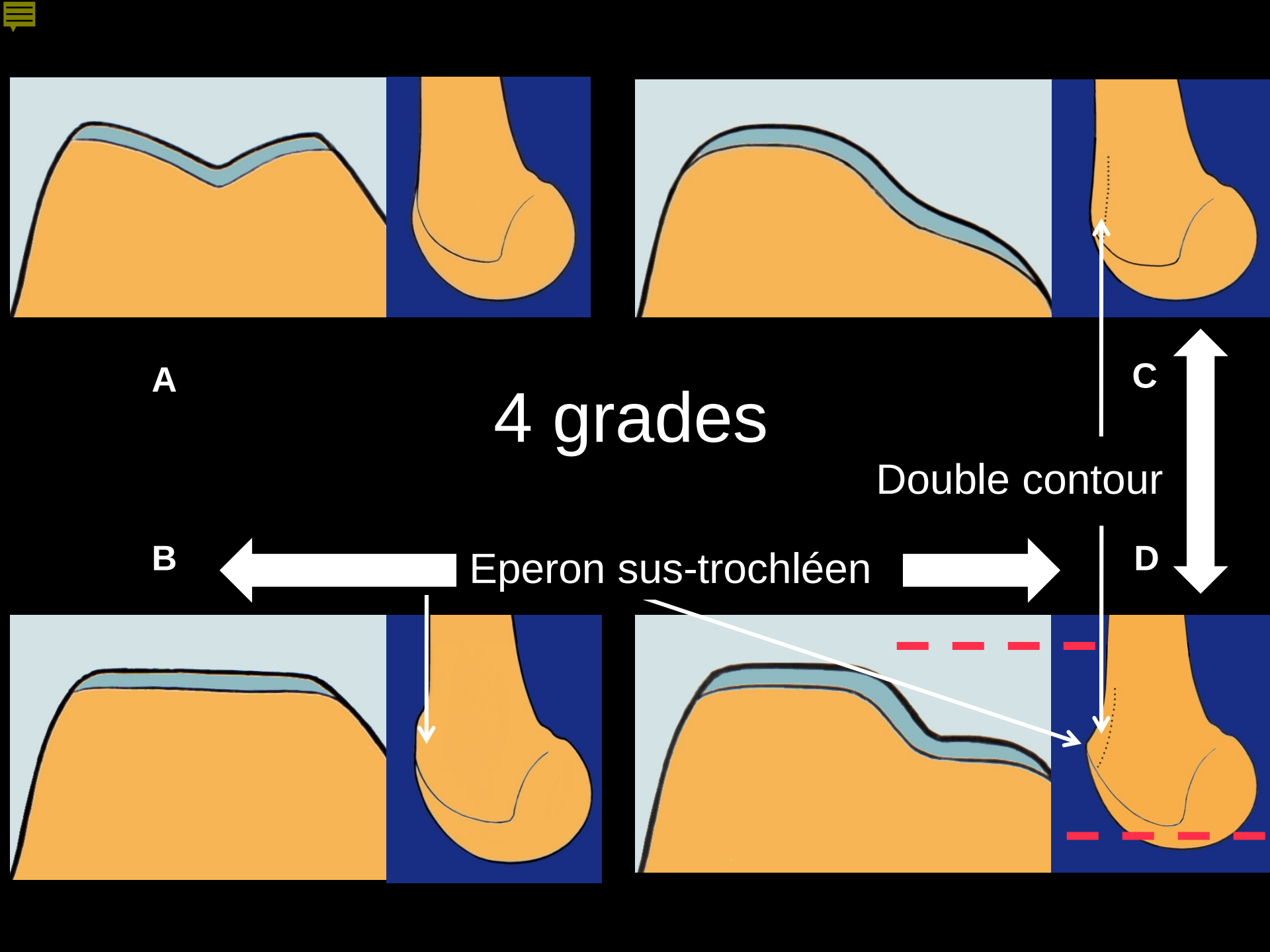
CT-Scan

Tecklenburg K, Dejour D, Hoser C, Fink C
Bony and cartilaginous anatomy of the patellofemoral joint
KSSTA, 2006,14, 235-240

4 grades

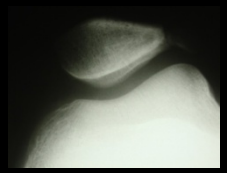
Signe du croisement

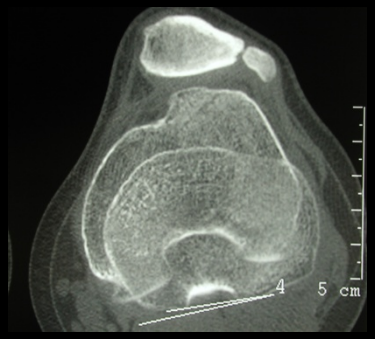



A
4 grades
C
Double contour
B
Eperon sus-trochléen
D

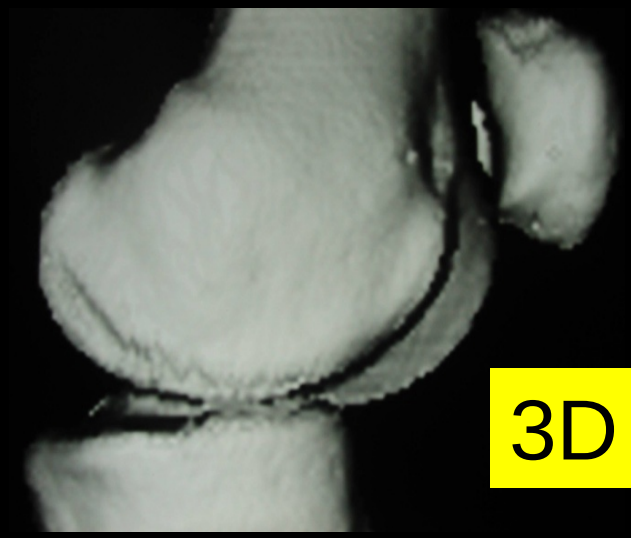
- Trochlée dysplasique

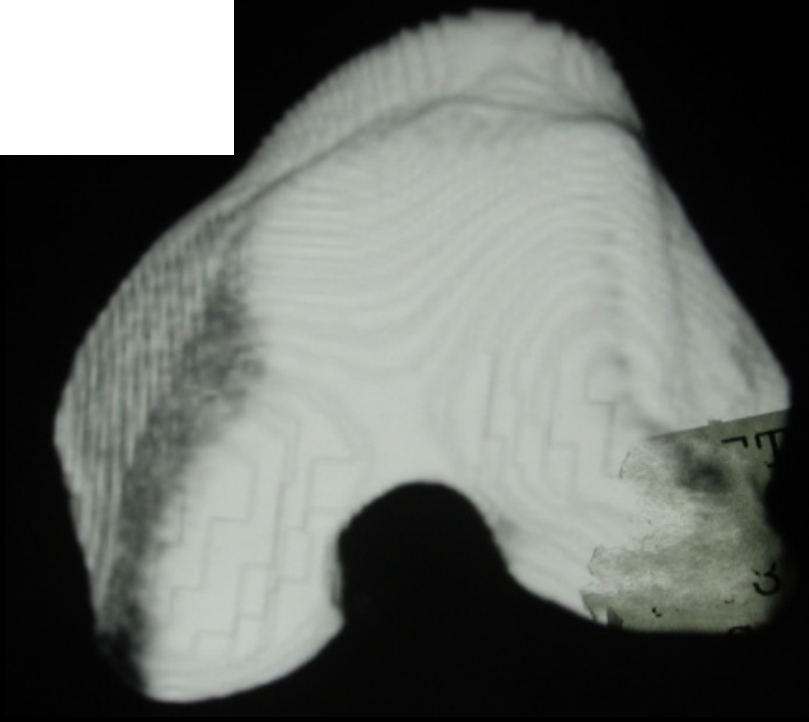
Radios





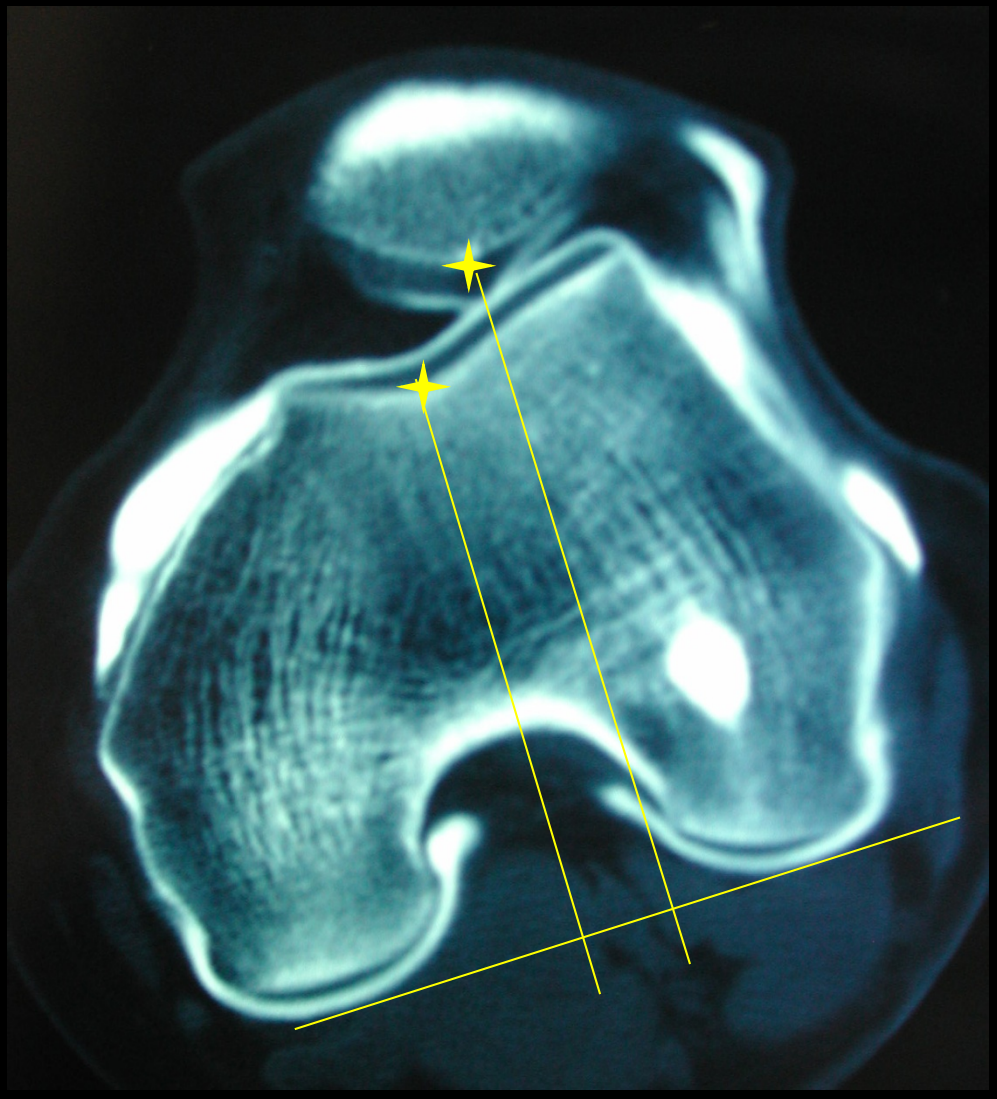
CT-Scan

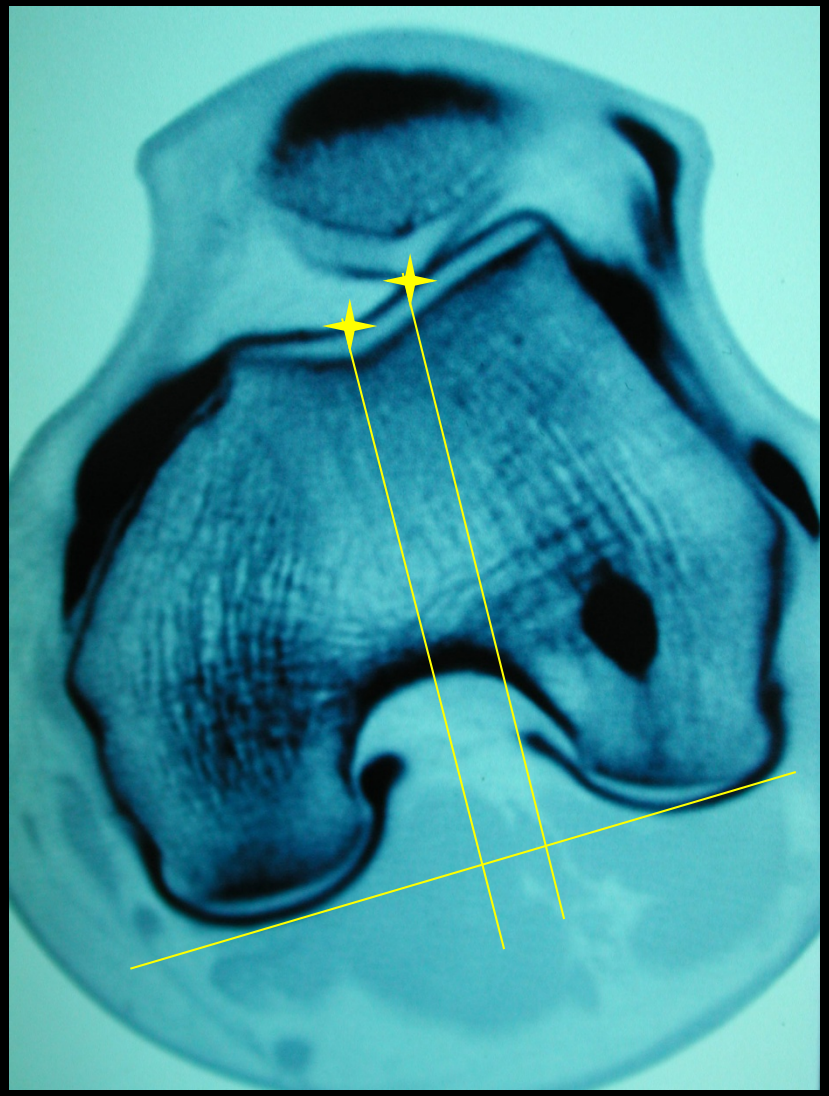




3D CT-Scan ??

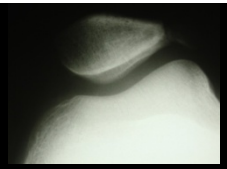
- Trochlée dysplasique





- Trochlée dysplasique

Radios



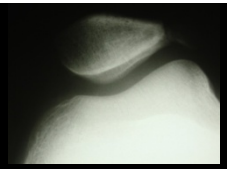
CT-Scan

RMN

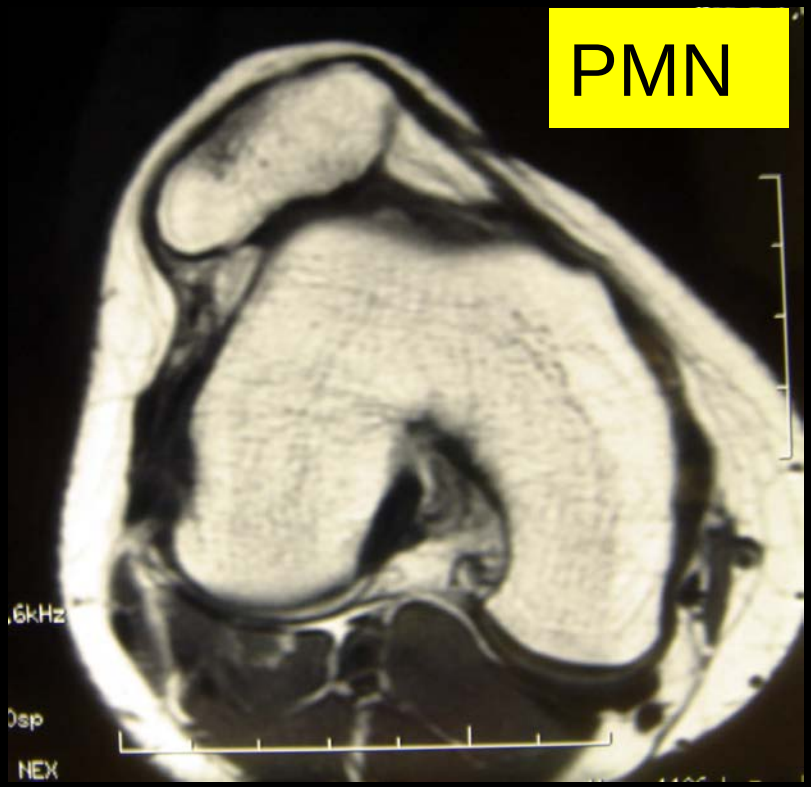
Staubli HU, Durrenmatt U, Porcellini B, Rauschning W,
Anatomy and surface geometry of the patellofemoral joint in the axial plane
JBJS Br, 1999, 81, 452-458

- Trochlée dysplasique

Radios



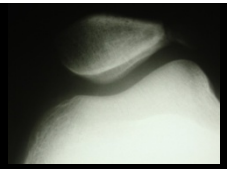
CT-Scan



Van Huyssteen AL, Hendrix MR, Barnett AJ, Wakeley CJ,
Eldridge JD
Cartilage-bone mismatch in the dysplastic trochlea. An MRI study
JBJS Br, 2006,88(5): 688-91

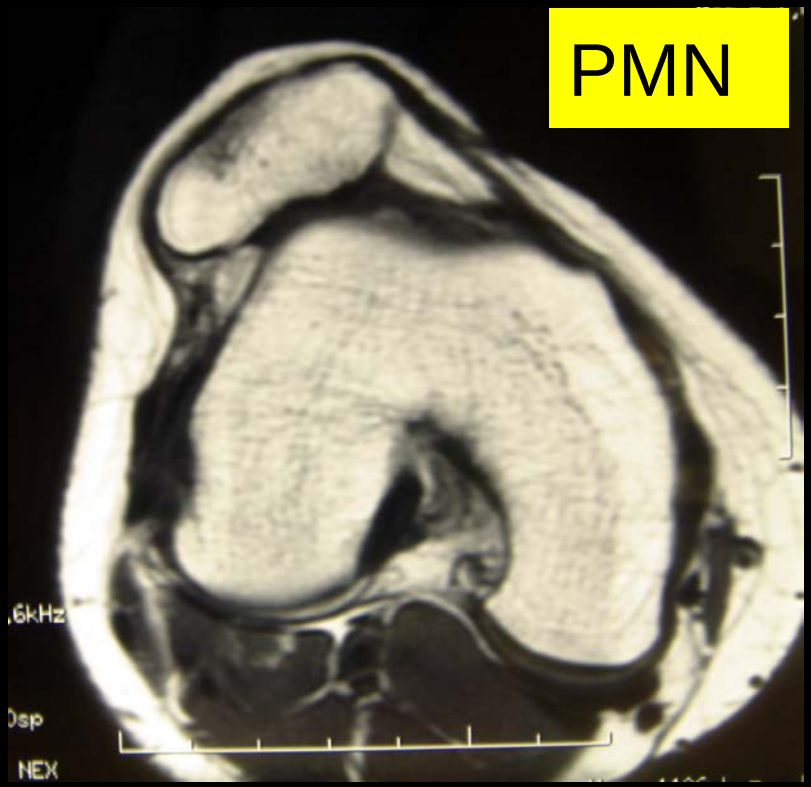
- Trochlée dysplasique

Radios



CT-Scan

PMN



Validation de la classification de D Dejour en RMN
AJSM Avril 2012

Am J Sports Med. 2012 Apr;40(4):837-43. Epub 2012 Jan 11.

Observer agreement on the Dejour trochlear dysplasia classification: a comparison of true lateral radiographs and axial magnetic resonance images.

Lippacher S, Dejour D, Elsharkawi M, Dornacher D, Ring C, Dreyhaupt J, Reichel H, Nelitz M.

Department of Orthopaedics, University of Ulm, Ulm, Germany. sabinelippacher@yahoo.de

Abstract

BACKGROUND: Trochlear dysplasia is known to be an important cause of patellofemoral instability. D. Dejour's radiographic and magnetic resonance imaging (MRI) classifications are widely used in clinical practice and in the orthopaedic literature to assess the severity of trochlear dysplasia. The indication for deepening trochleoplasty to treat trochlear dysplasia is also mainly based on the severity of trochlear dysplasia according to Dejour's criteria.

PURPOSE: To our knowledge, there is no study evaluating the efficacy of the Dejour classification. The aim of this study was to assess the intraobserver and interobserver agreements of the radiographic and MRI-based classification as described by Dejour.

STUDY DESIGN: Cohort study (diagnosis); Level of evidence, 2.

METHODS: From 50 patients, 50 lateral radiographs as well as 50 MRI scans were read twice independently within 4 weeks by 4 surgeons (2 senio and 2 junior examiners). Analysis was made according to Dejour's 4 grades of radiological criteria of trochlear dysplasia as well as differentiating between 2 grades: low-grade (type A) and high-grade trochlear dysplasia (types B-D).

RESULTS: The 4-grade analysis showed fair intraobserver and interobserver agreements (24%-78%), while the 2-grade analysis showed good to excellent agreement (56%-96%). The best overall agreement was found for the 2-grade analysis on MRI scans (62%-96%). The lateral radiographs tended to underestimate the severity of trochlear dysplasia compared with axial MRI.

CONCLUSION: D. Dejour's classification is valid for typing trochlear dysplasia and is particularly useful in separating low-grade from high-grade dysplasia.

- Trochlée dysplasique

Profondeur de la trochlée (arche romane)

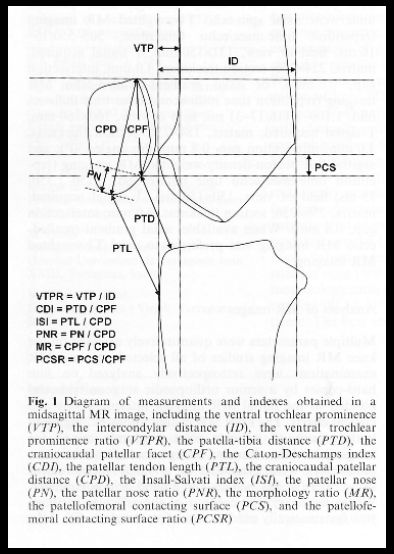


Fig. 1 Diagram of measurements and indexes obtained in a midsagittal MR image, including the ventral trochlear prominence (*VTP*), the intercondylar distance (*ID*), the ventral trochlear prominence ratio (*VTPR*), the patella-tibia distance (*PTD*), the craniocaudal patellar facet (*CPF*), the Caton-Deschamps index (*CDI*), the patellar tendon length (*PTL*), the craniocaudal patellar distance (*CPD*), the Insall-Salvati index (*ISI*), the patellar nose (*PN*), the patellar nose ratio (*PNR*), the morphology ratio (*MR*), the patellofemoral contacting surface (*PCS*), and the patellofemoral contacting surface ratio (*PCSR*)

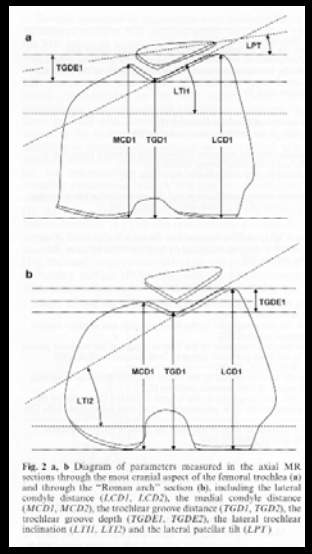


Fig. 2 a, b Diagram of parameters measured in the axial MR sections through the most cranial aspect of the femoral trochlea (a) and through the "Roman arch" sections (b), including the lateral condyle distance (*LCD1, LCD2*), the medial condyle distance (*MCD1, MCD2*), the trochlear groove distance (*TGD1, TGD2*), the trochlear groove depth (*TGDE1, TGDE2*), the lateral trochlear inclination (*LTI1, LTI2*) and the lateral patellar tilt (*LPT*)

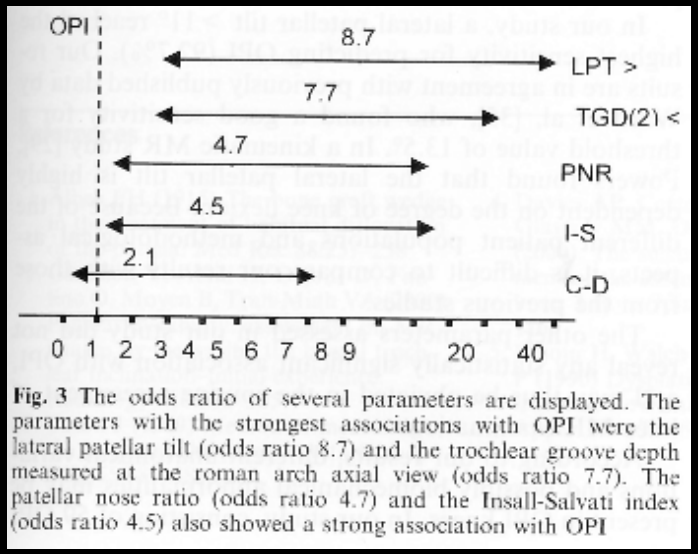
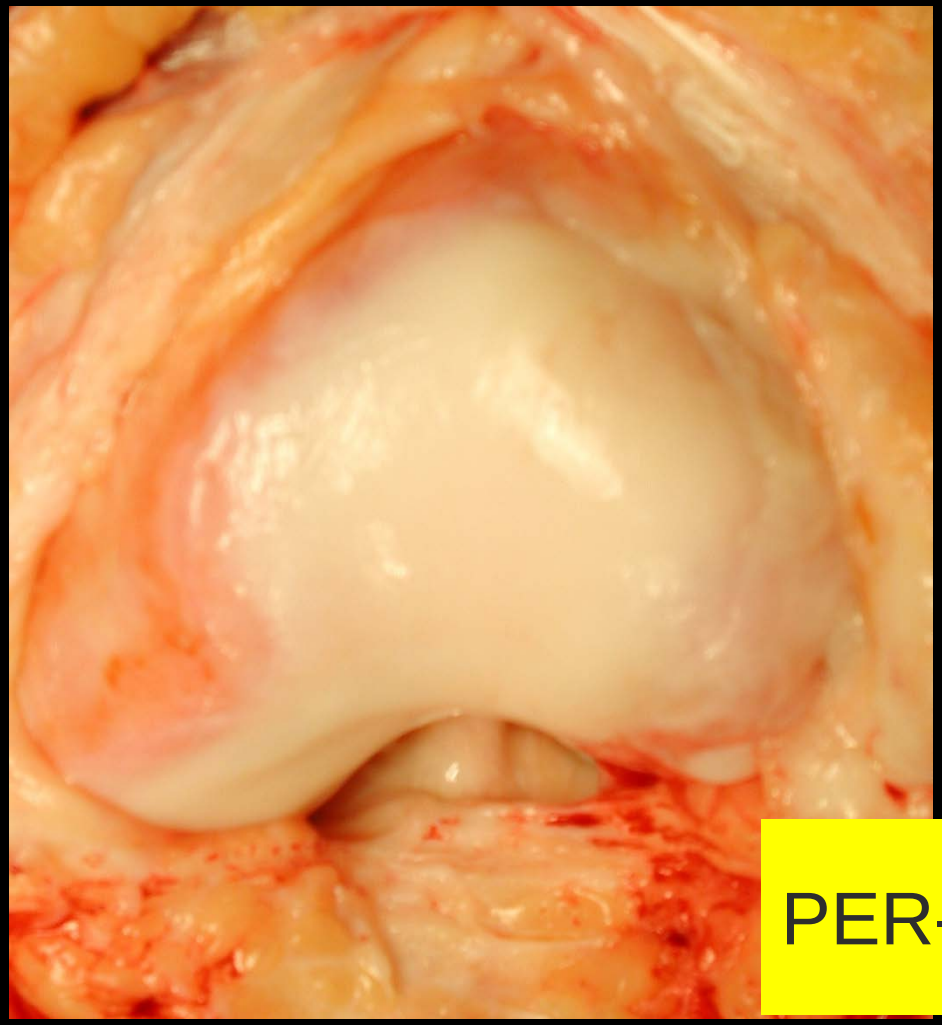
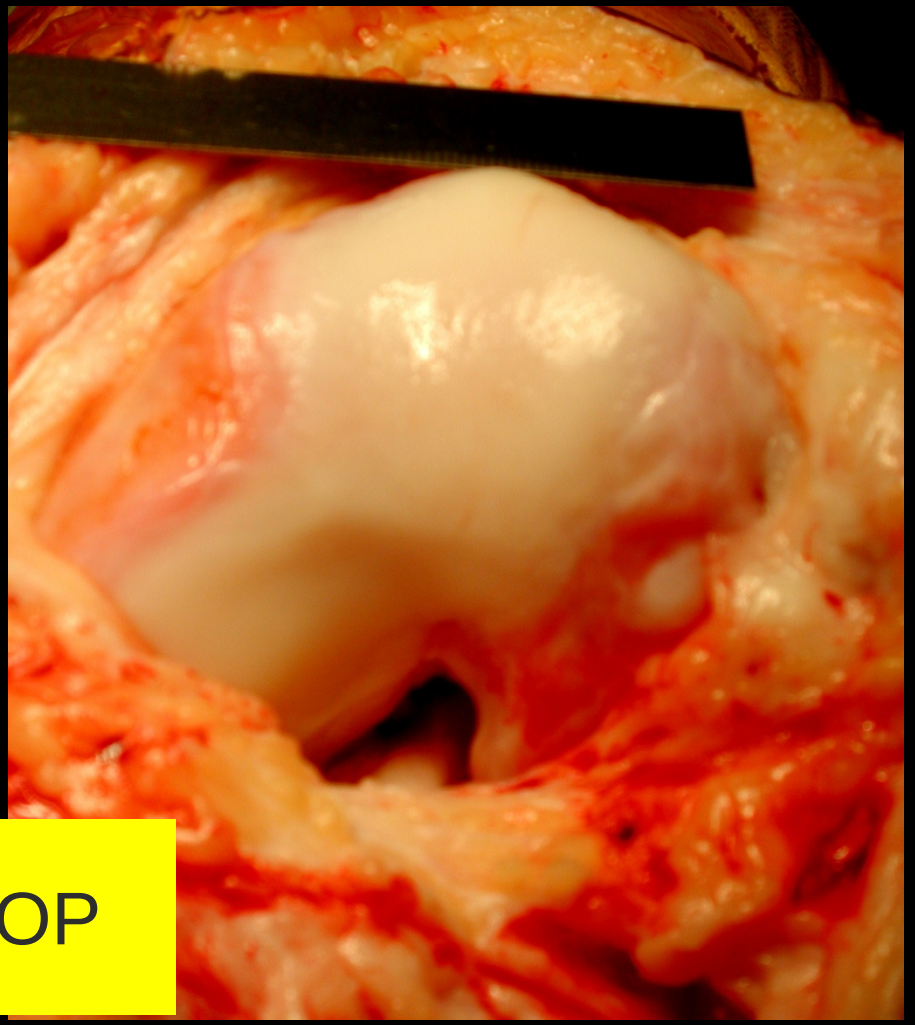


Fig. 3 The odds ratio of several parameters are displayed. The parameters with the strongest associations with OPI were the lateral patellar tilt (odds ratio 8.7) and the trochlear groove depth measured at the roman arch axial view (odds ratio 7.7). The patellar nose ratio (odds ratio 4.7) and the Insall-Salvati index (odds ratio 4.5) also showed a strong association with OPI

Escala J, Mellado J, Olona M, Giné J, Sauri A, Neyret P: Objective patellar instability: MR-based quantitative assessment of potentially associated anatomical features KSSTA 2006, 4, 264-272

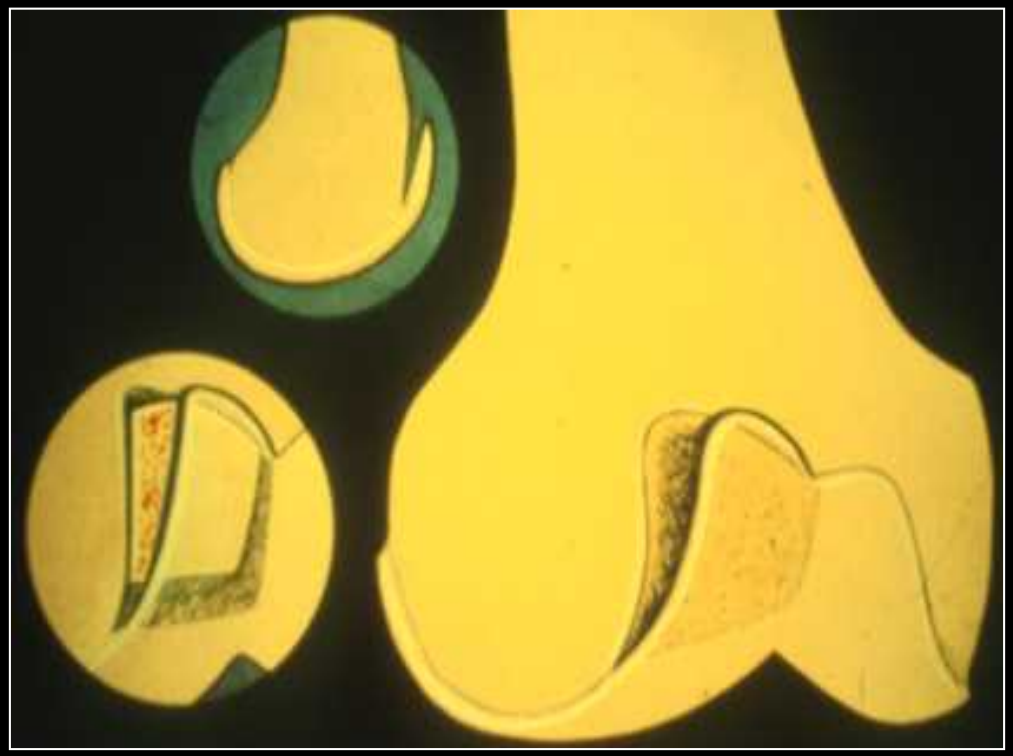
- Trochlée dysplasique



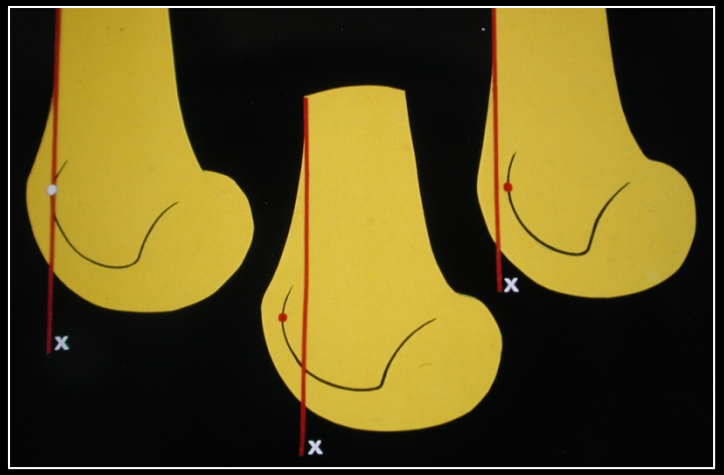


PER-OP

Les Trochléoplasties



Illogique si la saillie est positive



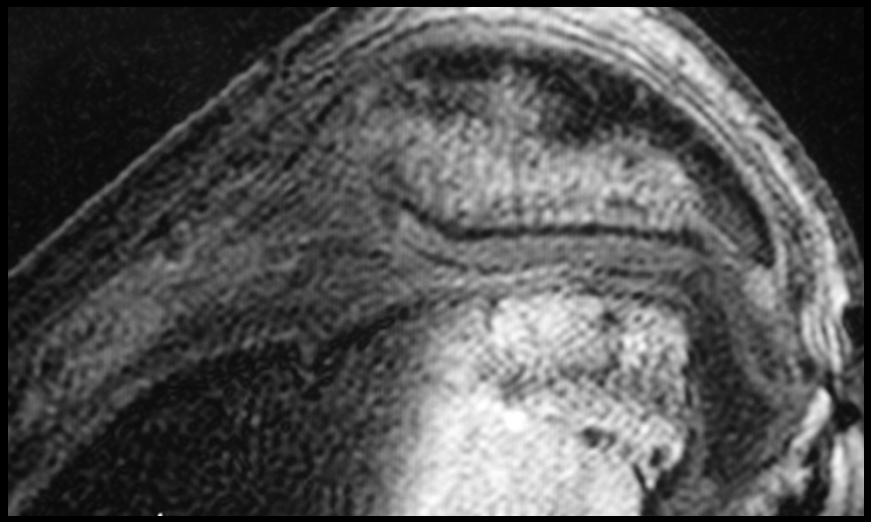
Albee FH
Bone graft wedge for habitual dislocation of the patella
Med. Rec., 1915, 88, 367-370

Les Trochléoplasties

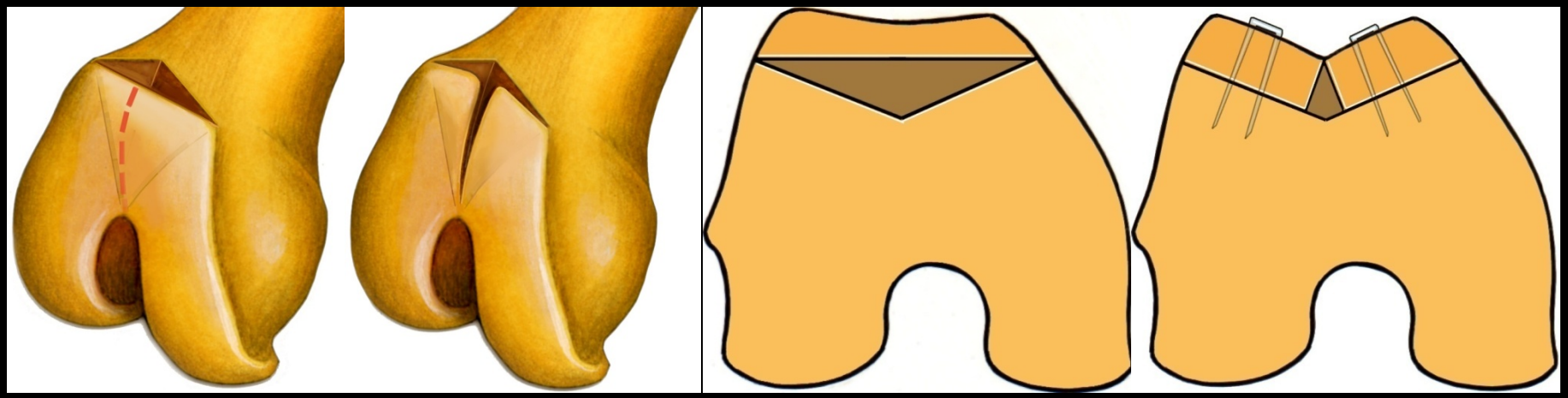
L’ intervention d’Albee ne réduit pas la saillie

mais élève la berge externe de trochlée et

aggrave les contraintes fémoropatellaires externes.,



Les Trochléoplasties

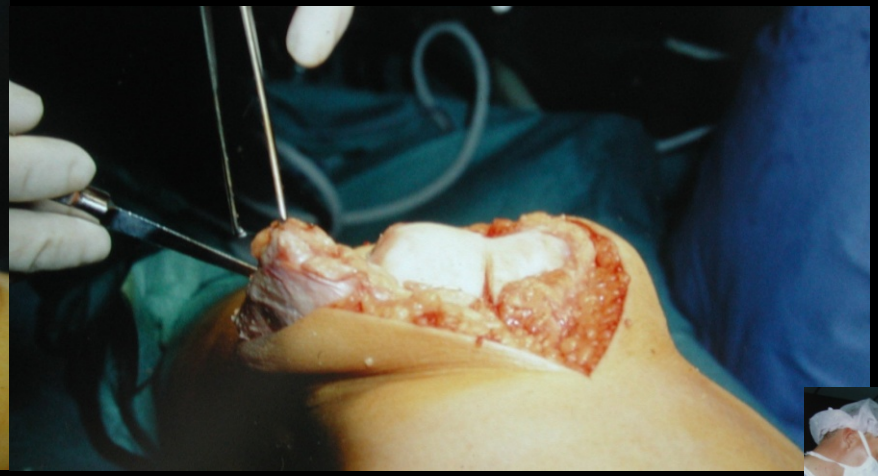


La trochléoplastie creusement
selon Henri Dejour

1987

Amis A, Oguz C, Bull AM, Senawongse W, Dejour D
The effect of trochleoplasty on patellar stability and kinematics:
a biomechanical study in vitro
JBJS Br, 2008, 90(7): 864-9

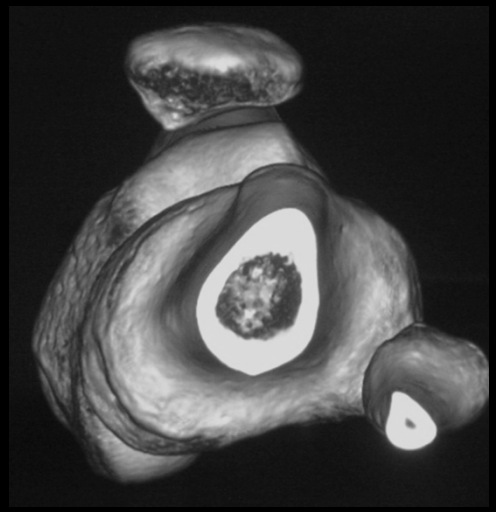
Les Trochléoplasties

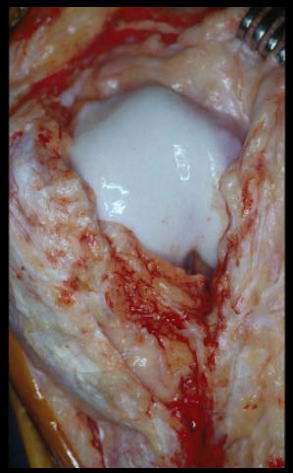


Les Trochléoplasties

Indications

1. Dysplasie trochléenne sévère: saillie > 6mm
2. Course anormale de la rotule
3. Récidive post-opératoire LER

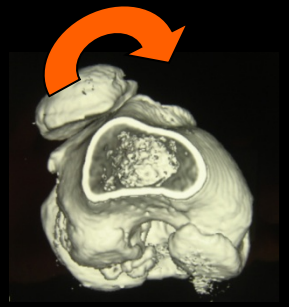




Les Trochléoplasties

Indications

4. Trochléoplastie + autres gestes
5. AFPE ???



Steiner TM, Torga-Spak R, Teitje RA
Medial patellofemoral reconstruction in patients with lateral patellar instability and trochlear dysplasia
AJSM 2006, 34(8): 1254-61

Les Trochléoplasties

Verdonk R, Jansegers E, Stuys B
Trochleoplasty in dysplastic knee trochlea
KSSTA, 2005, 13(7): 529-33

Donell ST, Joseph G, Hing CB, Marshall TJ
Modified Dejour' trochleoplasty for severe dysplasia: operative technique and early clinical results
Knee, 2006, 13(4): 266-73

Les Trochléoplasties

Ulting MR, Mulford JS, Eldridge JD
A prospective evaluation of trochleoplasty for the treatment of patellofemoral dislocation and instability
JBJS Br, 2008, 90(2): 180-5

Koeter S, Pakvis D, van Loon CJ, van Kampen A
Trochlear osteotomy for patellar instability: satisfactory minimum 2-year results in patients with dysplasia of the trochlea
KSSTA, 2007, 15(3): 228-32

Orthop Traumatol Surg Res. 2011 Dec;97(8):833-45. Epub 2011 Nov 22.

Recession wedge trochleoplasty as an additional procedure in the surgical treatment of patellar instability with major trochlear dysplasia: early results.

Thaunat M, Bessiere C, Pujol N, Boisrenoult P, Beaufils P.

Orthopaedic Surgery Department, Versailles Hospital Center, André-Mignot Hospital, 177, rue de Versailles, 78157 Le Chesnay, France. mathieuthaunat@yahoo.fr

Abstract

INTRODUCTION: The importance of a dysplastic trochlea as a component of patellar instability has long been recognized. An original trochleoplasty technique consisting in retro-trochlear recession wedge osteotomy was described by Goutallier et al. The aim is not to fashion a groove but to reduce the bump without modifying patellofemoral congruence.

PATIENTS AND METHODS: This retrospective study reports the operative technique and short-term outcomes of a consecutive case series of 17 patients (19 knees) who underwent recession wedge trochleoplasty for patellofemoral instability associated with severe trochlear dysplasia. Other contributing factors of patellar instability were also corrected as part of the surgical procedure: tibial tuberosity transfer (n=18), MPFL reconstruction (n=8).

RESULTS: Minimum follow-up was 12 months (mean, 34 months; range, 12 to 71 months). The trochlear prominence was reduced from a mean 4.8mm (range, 0 to 8mm) to -0.8mm (range, -8 to 6mm). Patellar tilt was reduced from a mean 14° (range, 6° to 26°) to 6° (range, -1° to 24°). Two cases showed recurrent patellofemoral instability. Mean Kujala, KOOS and IKDC score were respectively 80 (± 17), 70 (± 18) and 67 (± 17) at last follow-up. Three patients required further operations, apart from removal of metal screws: arthroscopic arthrolysis for stiffness (n=1), revision for tibial tuberosity non-union (n=1), and supratrochlear exostosectomy (n=1).

DISCUSSION: Recession wedge trochleoplasty is a feasible additional procedure addressing bony trochlear abnormality in the surgical treatment of patellar instability. Our attitude is to perform it never in isolation but associated to realignment of the extensor apparatus according to the à la carte surgery concept. It seems to be effective in preventing future patellar dislocation and reducing anterior knee pain in case of painful patellofemoral instability with a major dysplastic trochlea, or in revision cases when other realignment procedures have failed.

PMID: 22112463 [PubMed - indexed for MEDLINE]

Sports Med Arthrosc Rehabil Ther Technol. 2012 Feb 21;4:7.

Trochleoplasty in major trochlear dysplasia: current concepts.

Beaufils P, Thaunat M, Pujol N, Scheffler S, Rossi R, Carmont M.

Orthopaedic Surgery Department, Centre Hospitalier de Versailles, Versailles, France. pbeaufils@ch-versailles.fr.

Abstract

ABSTRACT: Trochleoplasty is the theoretical solution to persistent symptoms (pain and/or instability) related to trochlear dysplasia where there is not only a trochlear flatness but also a trochlear prominence. The threshold of prominence indicating surgical intervention has as yet not been determined. A bump of 5 mm is generally accepted as the inferior limit. Given the interventional nature of this demanding procedure, it should be proposed in selected cases after considerable discussion with the patient. Trochleoplasty is indicated as a primary procedure for major trochlear dysplasia with a prominence > 5 mm. Stabilization is obtained in most of the cases with the risk of residual mild anterior knee pain. It is also indicated as a salvage procedure when a previous surgery failed. Despite the reputation of the procedure, the published results are encouraging in terms of prevention of re-dislocation, satisfaction index, and radiological outcomes. Post-operative stiffness is the main complication, which may require manipulation under anaesthesia or arthroscopic arthrolysis. There are few other complications reported and to date secondary necrosis of the trochlea has not been reported. Technically speaking, the deepening trochleoplasty is a difficult procedure without reliable landmarks. We propose a recession wedge trochleoplasty which is an easier procedure. It is never undertaken as an isolated procedure, but always in conjunction with other realignment procedures of the extensor apparatus according to the "a la carte" surgery concept.

PMID: 22353469 [PubMed - in process] PMCID: PMC3307428 **Free PMC Article**

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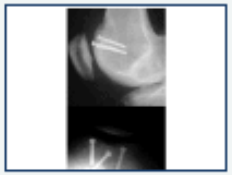
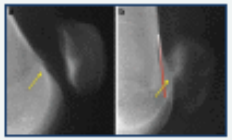
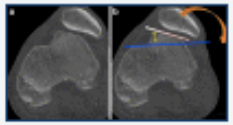

Ups J Med Sci. 2011 Nov;116(4):285-8. Epub 2011 Sep 16.

Recurrent dislocation of the patella accompanying hypotrochlea of the femur and malalignment of the patella.

Horikawa A, Kodama H, Miyakoshi N, Yamada S, Miyamoto S.

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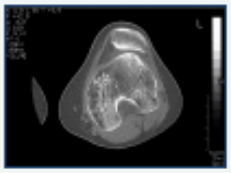
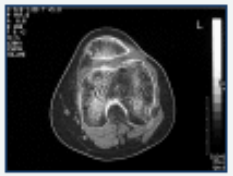
Abstract

This case report describes a rare case of recurrent dislocation of the patella which was accompanied with trochlear dysplasia and malalignment of the patella in a 15-year-old girl. She complained of hemoarthrosis and recurrent patellar dislocation in the early knee flexion phase. Plain radiography and computed tomography (CT) showed patellar malalignment (quadriceps angle 20°) and severe dysplasia of the trochlea of the femur (sulcus angle 170°). Surgery was performed, consisting of trochleoplasty in addition to proximal and distal realignment. Trochleoplasty was undertaken using a modified Dejour technique. After surgery, the patient complained of joint contracture. Arthroscopic release of fibrous tissue relieved symptoms and obtained normal range of motion without patellar dislocation. Postoperative radiography and CT demonstrated improvement of the quadriceps angle (10°) and sulcus angle (140°).

PMID: 21919813 [PubMed - indexed for MEDLINE] PMCID: PMC3207305 **Free PMC Article**

Images from this publication. See all images (3) Free text


Acta Orthop Belg. 2011 Feb;77(1):116-21.

Closing wedge patellar osteotomy in combination with trochleoplasty.

Koch PP, Fuchs B, Meyer DC, Fucentese SF.

Department of Orthopaedic Surgery, University of Zurich, Balgrist, Zurich, Switzerland. peter.koch@balgrist.ch

Abstract

Sulcus-deepening trochleoplasty may result in a serious patellofemoral incongruence in cases where the patella also is highly dysplastic. In such cases, a closing wedge osteotomy of the patella may be considered. The technique was used in two patients (both female, 16 1/2 and 14 years old respectively) out of 85 trochleoplasties performed. At two years follow-up, both patients showed a stable patella with correct tracking. Both considered their functional result as excellent. Postoperative radiographs showed a normal sulcus angle (135 degrees and 132 degrees) with good congruence. Closing wedge patellar osteotomy, combined with sulcus-deepening trochleoplasty, can increase patellofemoral congruence with good clinical outcome.

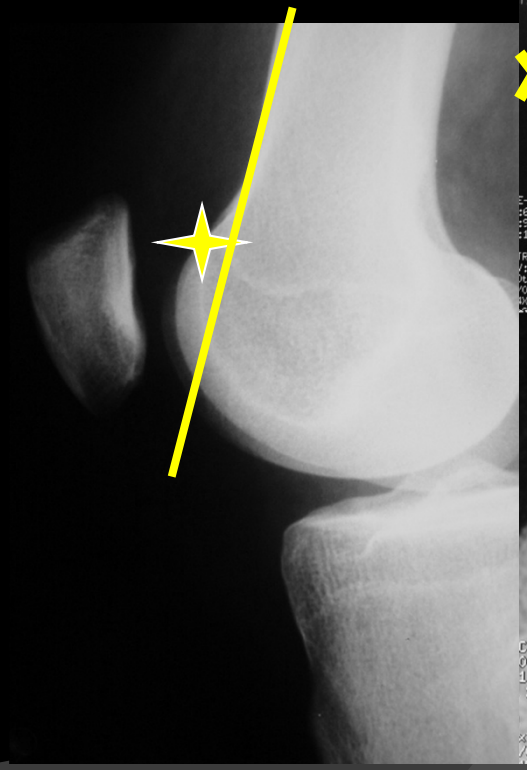
Les Trochléoplasties

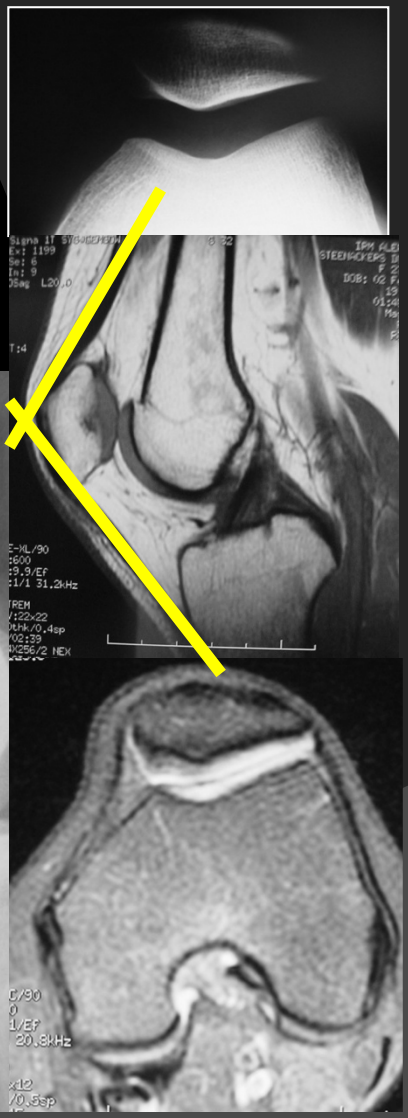
à ce jour

1. Techniquement très exigeante
2. Résultats encourageants sur la douleur et la stabilité rotulienne à court terme (80% E ou B)
3. A long terme ??

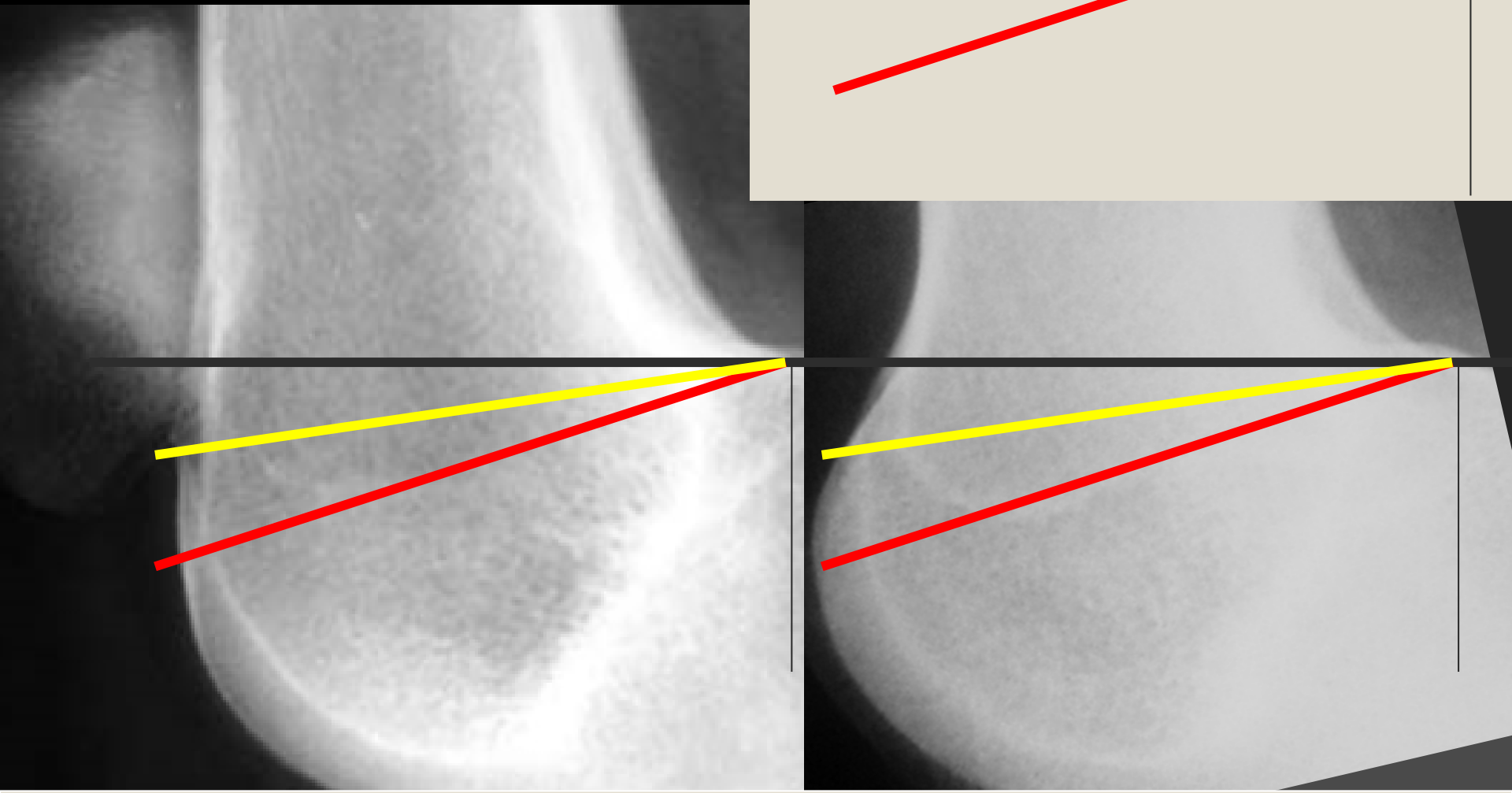
Schöttle PB, Schell H, Duda G, Weiler A
Cartilage viability after trochleoplasty
KSSTA, 2007,15(2): 161-67

Joss.. L 35Y





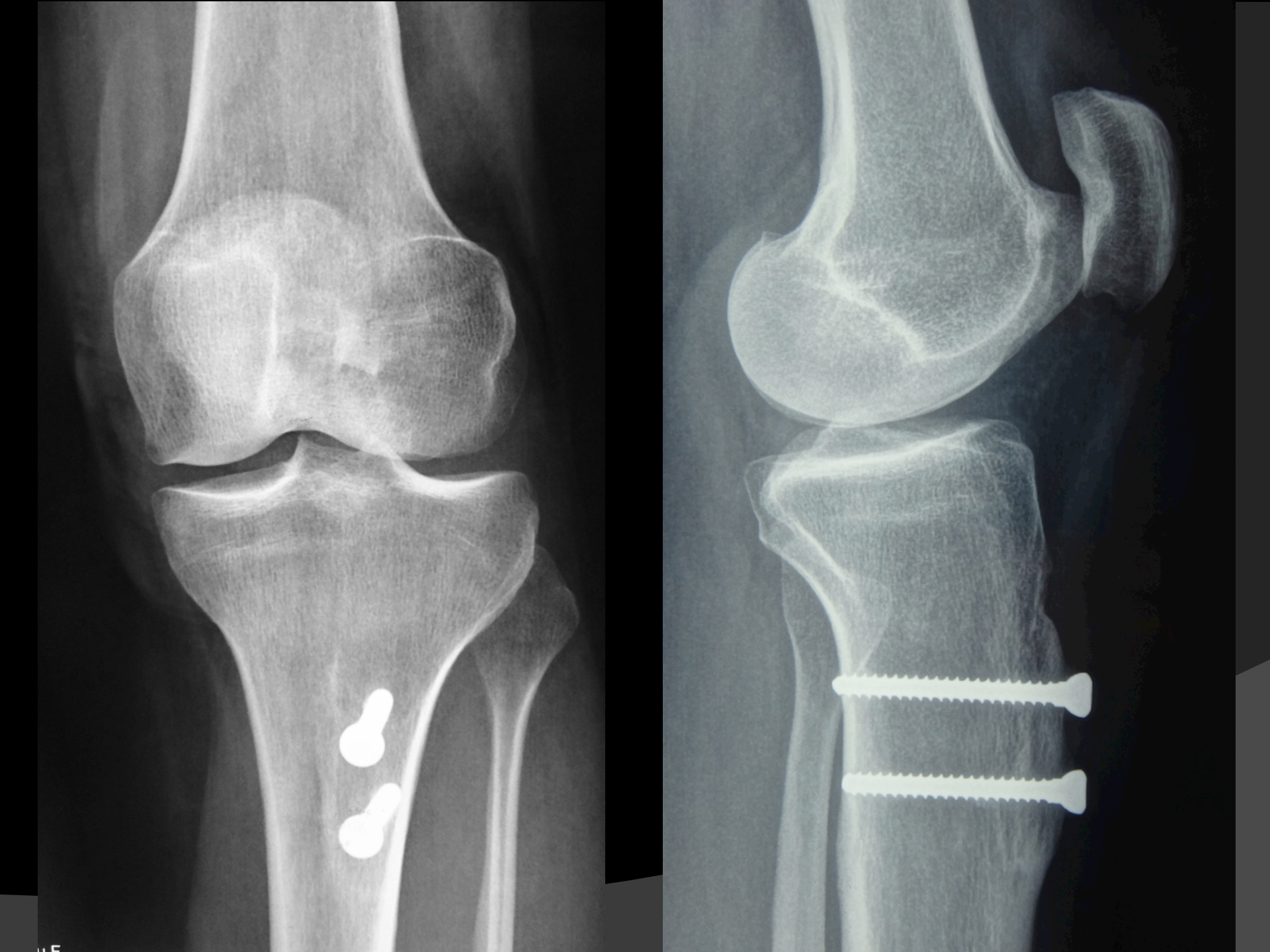
Steenack….

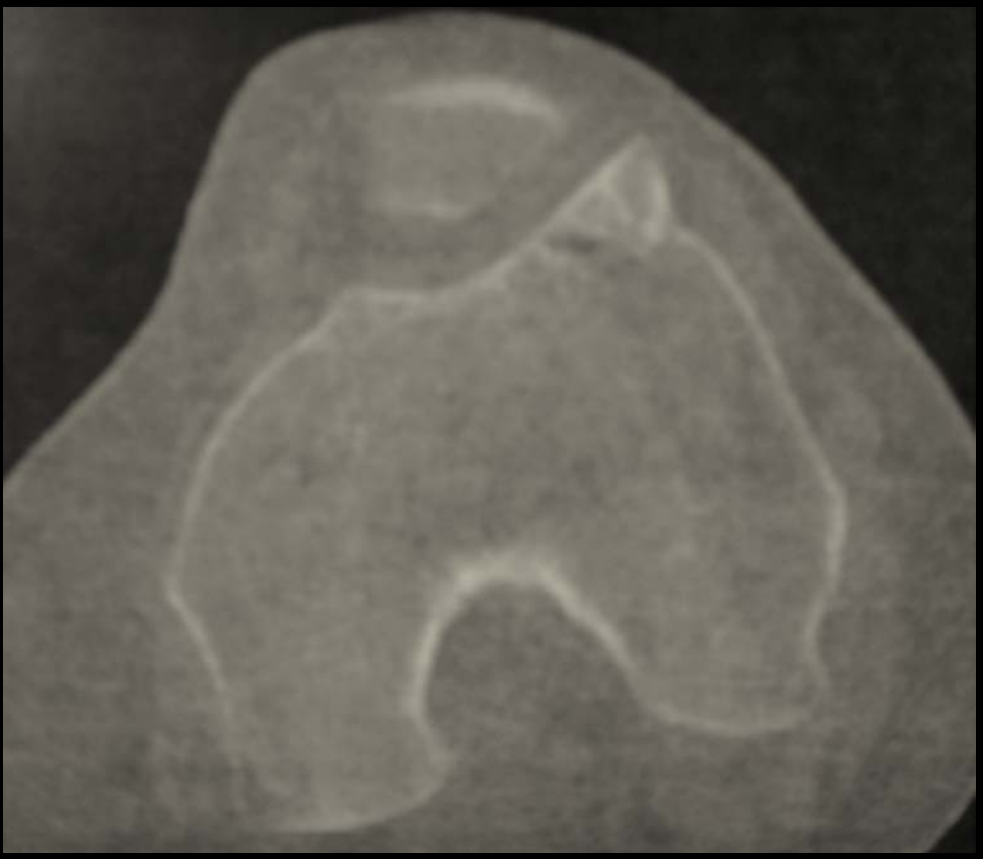


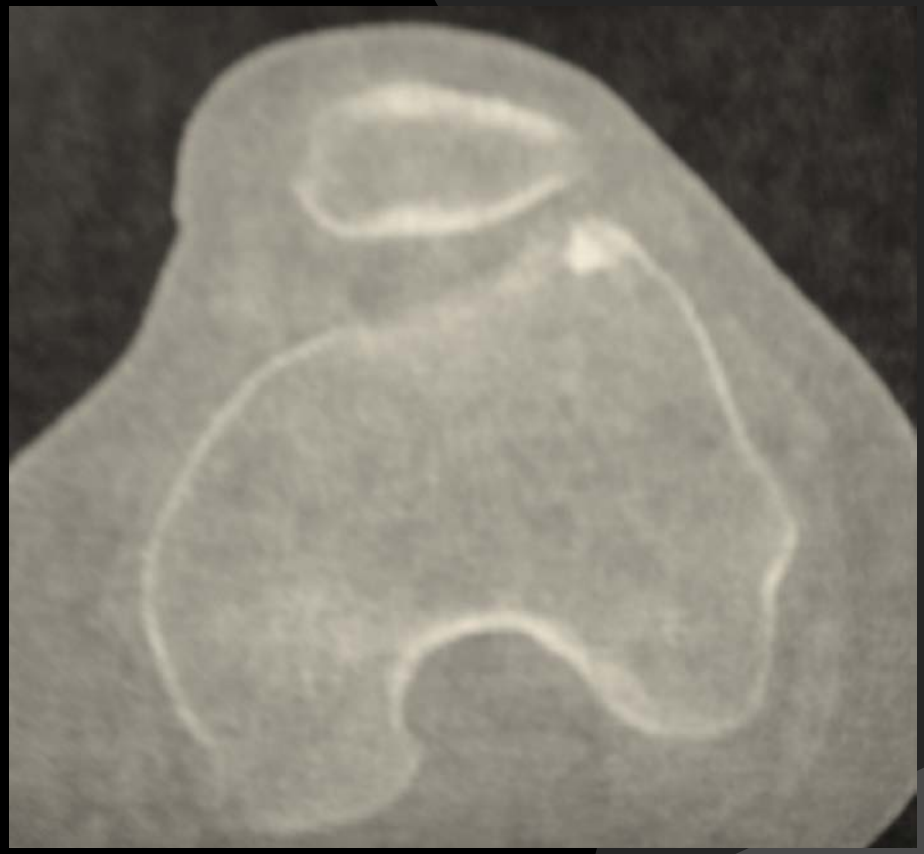
Del….. nancy

née le 16 Septembre 1969 (42 ans)

Albee + médialisation abaissement 10 ans auparavant pour luxation de rotule








TAGT G = 12 MM
1

1. Transfert proximal TTA
2. Latéralisation TTA
3. De-Albee
4. Reconstruction MPFL
5. De-Albee MPFL

Hôpitaux de Lyon

Université Claude Bernard Lyon 1

LYON GENOU CENTRE ALBERT TRILLAT

Merci de votre attention