



Pathologie rotulienne : place de l'arthroscopie

Axel Schmidt, Pr Sébastien Lustig, Pr Elvire Servien

Hôpital de la Croix Rousse

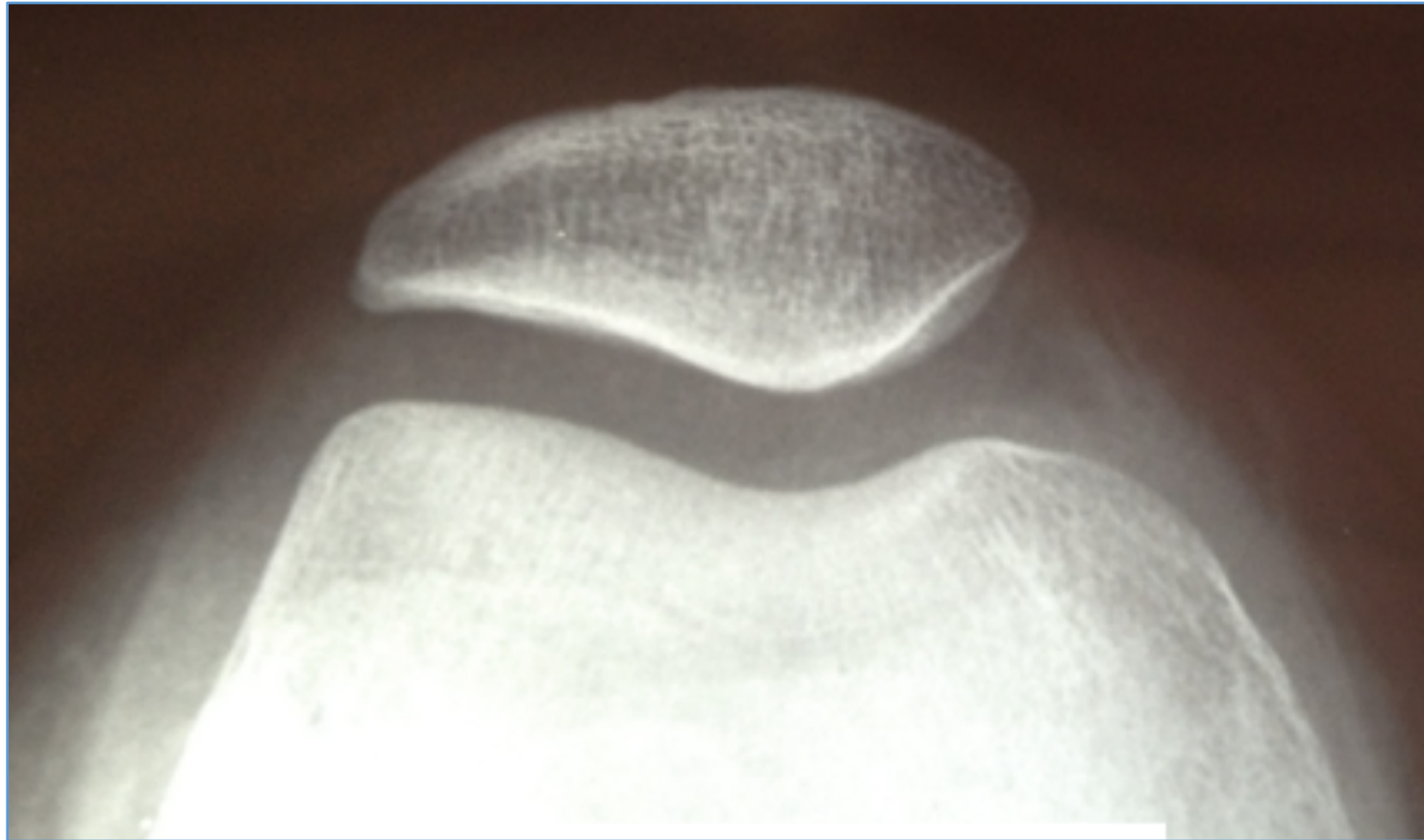
DIU Arthroscopie 2018-2019



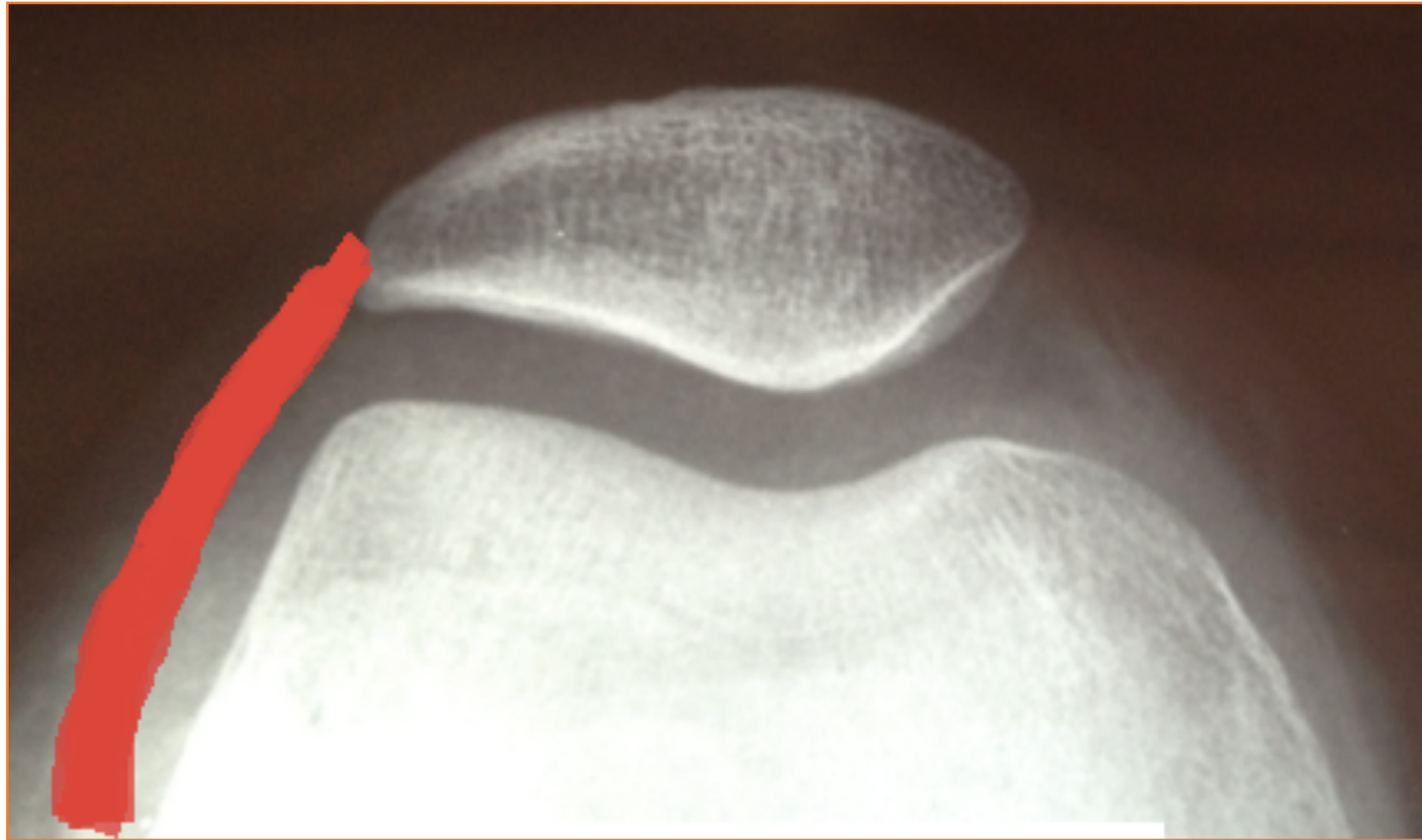
Hospices Civils de Lyon



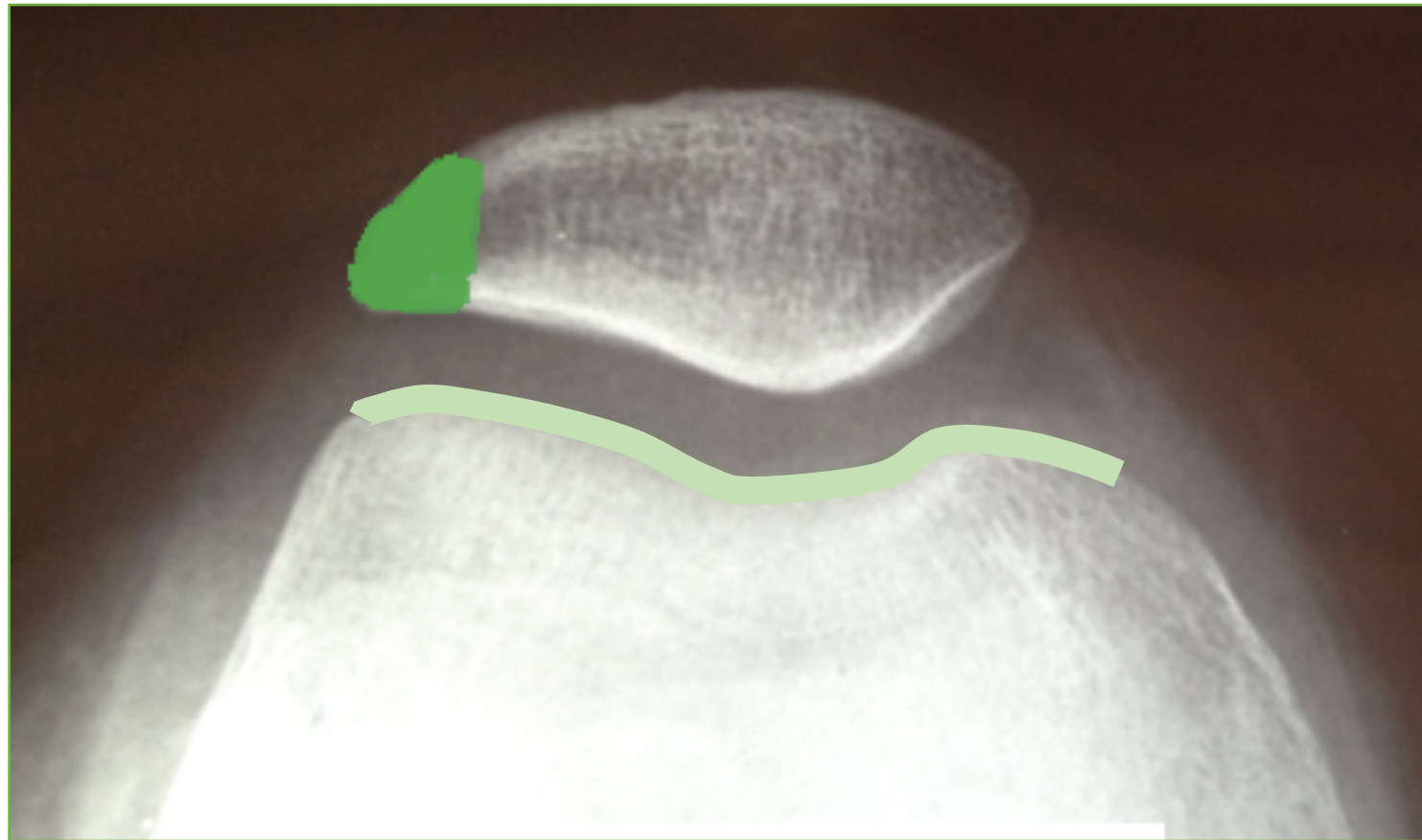
Patella et Arthroscopie



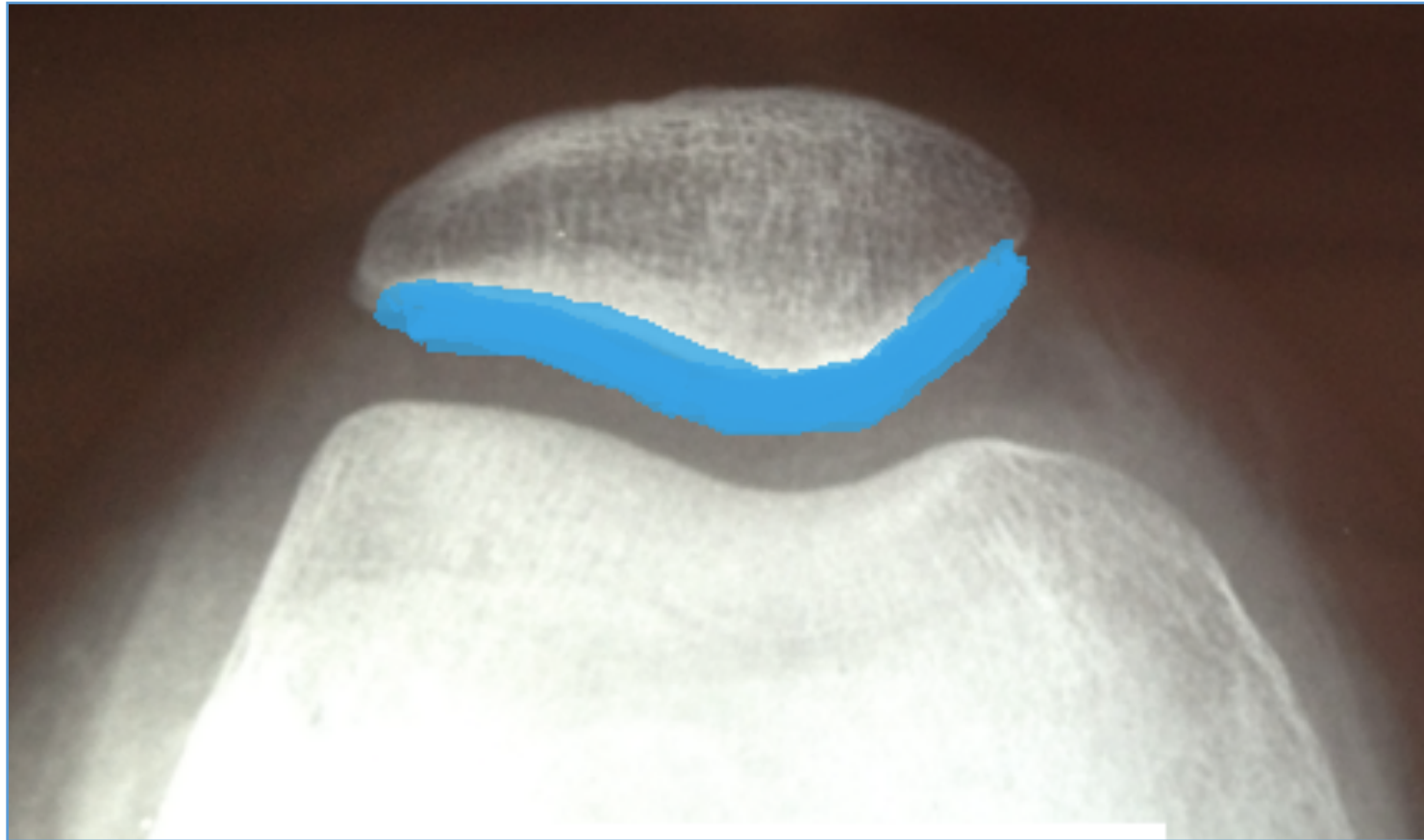
Patella et Arthroscopie



Patella et Arthroscopie



Patella et Arthroscopie



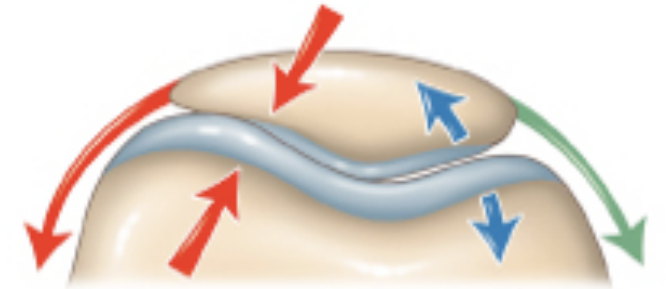
Aileron Patellaire Latéral

Aileron Patellaire Latéral

- Anatomie :



- Expansion fibreuse du muscle vaste externe
- Rétinaculum superficiel oblique
- Ligament épicondylo-patellaire
- Rétinaculum profond transverse
- Ligament patello-tibial
- Feuillet capsulo-synovial



- Rôle : stabilisateur latéral passif de la patella

- Tension augmente avec la flexion (max à 120°)



Section de l'Aileron Externe - Indications

- **Syndrome d'hyperpression patellaire latérale**
- **Instabilité fémoro-patellaire**
- **Arthrose fémoro-patellaire débutante**
- **Patella Bi-Partita**

Clin Orthop Relat Res. 1978 Jul-Aug;(134):158-67.

The patellar compression syndrome: surgical treatment by lateral retinacular release.

Larson RL, Cabaud HE, Slocum DB, James SL, Keenan T, Hutchinson T.

Arthroscopy. 2018 May;34(5):1550-1558. doi: 10.1016/j.arthro.2017.11.038. Epub 2018 Feb 15.

Clinical Outcome of Arthroscopic Lateral Retinacular Release for Symptomatic Bipartite Patella in Athletes.

Felli L¹, Formica M¹, Lovisollo S¹, Capello AG¹, Alessio-Mazzola M².

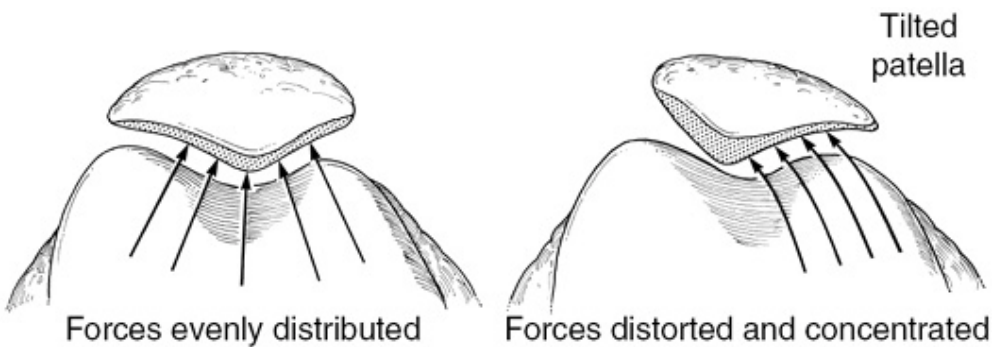
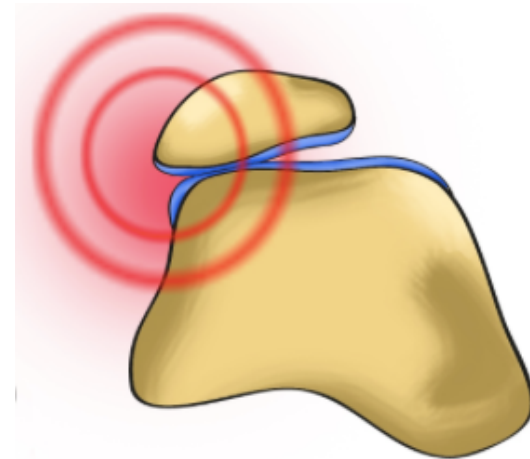
Knee. 2008 Dec;15(6):451-5. doi: 10.1016/j.knee.2008.06.003. Epub 2008 Jul 24.

Early results of arthroscopic lateral retinacular release in patellofemoral osteoarthritis.

Alemđarođlu KB¹, Cimen O, Aydođan NH, Atlihan D, Iltar S.

Section de l'Aileron Externe (SAE)

- Objectif :
 - Réduire les forces de compression et de latéralisation
- Ne rétablit pas l'alignement normal de l'appareil extenseur
- Associer à d'autres procédures supplémentaires



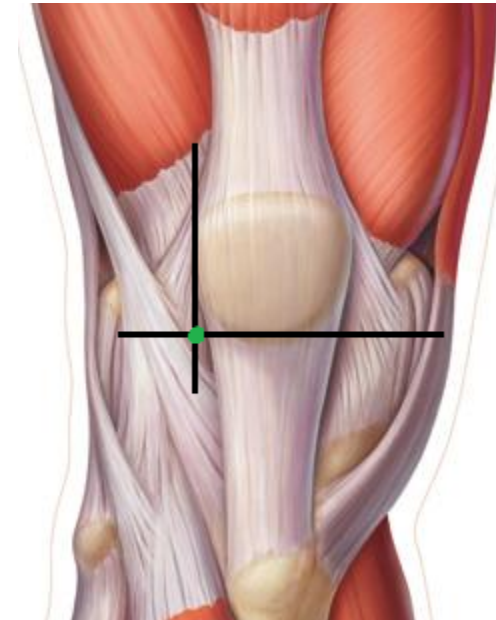
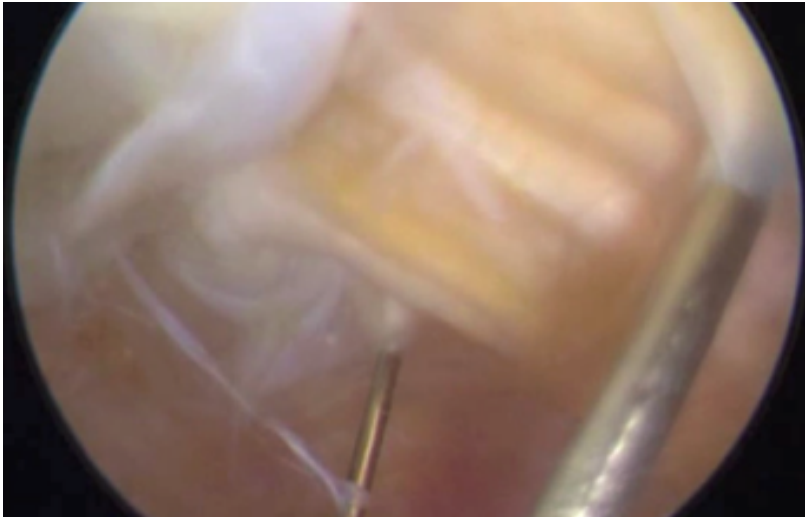
SAE : technique chirurgicale

- Optique standard (30°), genou en extension
- Système de Coblation
- Voies d'abord:
 - Antérolatérale (optique) & Antéromédiale
 - Supéro-latérale (instrumentale)
- Exploration :
 - Course rotulienne
 - Bascule rotulienne
 - Subluxation



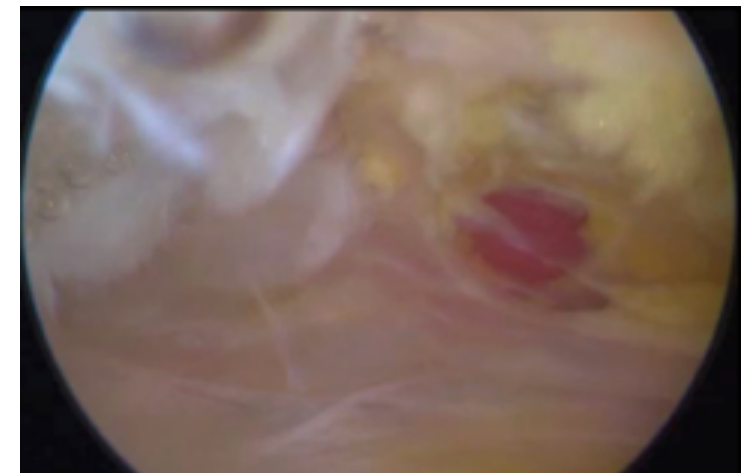
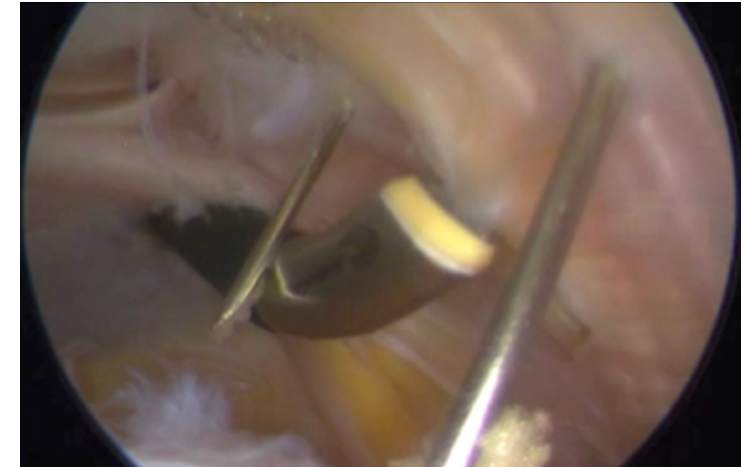
SAE : technique chirurgicale

- Identifier l'aile externe:
 - Limite supérieure : début des fibres musculaires du Vaste Externe
 - Limite inférieure : point de croisement entre la perpendiculaire passant par la pointe de la patella et la tangente au bord latéral de la patella



SAE : technique chirurgicale

- Préserver 1 cm en latéral de la rotule
 - Proximal -> distal
 - Feuillet par feuillet
- > Allongement de l'aile latérale +++
- Moins de douleur
 - Moins d'atrophie quadricipitale
 - Pas d'instabilité médiale résiduelle



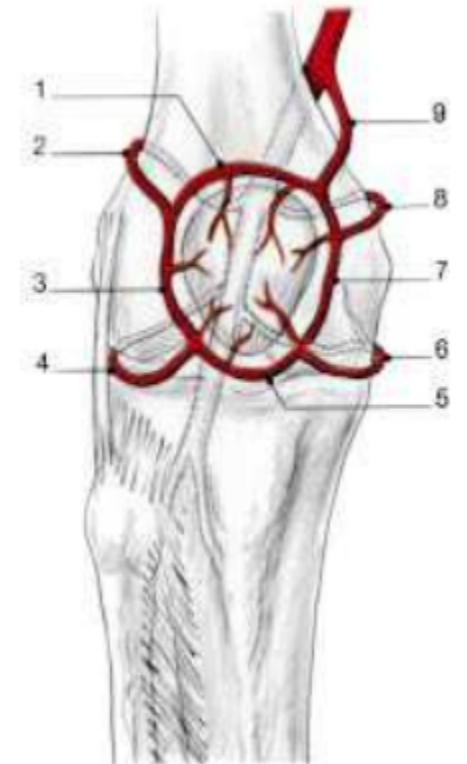
[Arthroscopy](#). 2012 Jun;28(6):788-97. doi: 10.1016/j.arthro.2011.11.004. Epub 2012 Feb 1.

Open lateral patellar retinacular lengthening versus open retinacular release in lateral patellar hypercompression syndrome: a prospective double-blinded comparative study on complications and outcome.

[Pagenstert G](#)¹, [Wolf N](#), [Bachmann M](#), [Gravius S](#), [Barq A](#), [Hintermann B](#), [Wirtz DC](#), [Valderrabano V](#), [Leumann AG](#).

SAE : technique chirurgicale

- Hémostase rigoureuse
- Au 1/3 moyen de la patella : artère géniculé externe se latéralise et croise le trajet de l'aileron externe
- Si procédures associées : SAE en 1^e (pas de consensus)



SAE : suites opératoires

- Flexion < 120° pendant 6 semaines
- Appui complet
- Contractions isométriques du quadriceps immédiatement
- Reprise activités sportives : 3 mois
- Consultation de contrôle : J45, M6



SAE - Complications

- Hémarthrose
- Faiblesse du muscle quadricipital
- Rupture du TQ
- Instabilité fémoro-patellaire médiale
- Brulures sous-cutanées



SAE - Résultats

[Sports Med Arthrosc Rev.](#) 2007 Jun;15(2):57-60.

The role of lateral retinacular release in the treatment of patellar instability.

[Lattermann C](#)¹, [Toth J](#), [Bach BR Jr](#).

[Knee Surg Sports Traumatol Arthrosc.](#) 2018 Nov 27. doi: 10.1007/s00167-018-5294-7. [Epub ahead of print]

Lateral retinacular release is not recommended in association to MPFL reconstruction in recurrent patellar dislocation.

[Malatray M](#)¹, [Magnussen R](#)², [Lustig S](#)^{3,4}, [Servien E](#)^{3,5}.

[Knee Surg Sports Traumatol Arthrosc.](#) 2007 May;15(5):547-54. Epub 2007 Jan 16.

Dynamic measurement of patellofemoral kinematics and contact pressure after lateral retinacular release: an in vitro study.

[Ostermeier S](#)¹, [Holst M](#), [Hurschler C](#), [Windhagen H](#), [Stukenborg-Colsman C](#).

[Rev Bras Ortop.](#) 2017 Jun 15;52(4):442-449. doi: 10.1016/j.rboe.2017.06.003. eCollection 2017 Jun-Jul.

Lateral patellar retinacular release: changes over the last ten years.

[Fonseca LPRMD](#)¹, [Kawatake EH](#)¹, [Pochini AC](#)².

SAE - Résultats

Sports Med Arthrosc Rev. 2007 Jun;15(2):57-60.

The role of lateral retinacular release in the treatment of patellar instability.

Lattermann C¹, Toth J, Bach BR Jr.

Knee Surg Sports Traumatol Arthrosc. 2018 Nov 27. doi: 10.1007/s00167-018-5294-7. [Epub ahead of print]

Lateral retinacular release is not recommended in association to MPFL reconstruction in recurrent patellar dislocation.

Malatray M¹, Magnussen R², Lustig S^{3,4}, Servien E^{3,5}.

Knee Surg Sports Traumatol Arthrosc. 2007 May;15(5):547-54. Epub 2007 Jan 16.

Dynamic measurement of patellofemoral kinematics and contact pressure after lateral retinacular release: an in vitro study.

Ostermeier S¹, Holst M, Hurschler C, Windhagen H, Stukenborg-Colsman C.

Rev Bras Ortop. 2017 Jun 15;52(4):442-449. doi: 10.1016/j.rboe.2017.06.003. eCollection 2017 Jun-Jul.

Lateral patellar retinacular release: changes over the last ten years.

Fonseca LPRMD¹, Kawatake EH¹, Pochini AC².

SAE - Résultats

[Sports Med Arthrosc Rev.](#) 2007 Jun;15(2):57-60.

The role of lateral retinacular release in the treatment of patellar instability.

[Lattermann C](#)¹, [Toth J](#), [Bach BR Jr](#).

[Knee Surg Sports Traumatol Arthrosc.](#) 2018 Nov 27. doi: 10.1007/s00167-018-5294-7. [Epub ahead of print]

Lateral retinacular release is not recommended in association to MPFL reconstruction in recurrent patellar dislocation.

[Malatray M](#)¹, [Magnussen R](#)², [Lustig S](#)^{3,4}, [Servien E](#)^{3,5}.

[Knee Surg Sports Traumatol Arthrosc.](#) 2007 May;15(5):547-54. Epub 2007 Jan 16.

Dynamic measurement of patellofemoral kinematics and contact pressure after lateral retinacular release: an in vitro study.

[Ostermeier S](#)¹, [Holst M](#), [Hurschler C](#), [Windhagen H](#), [Stukenborg-Colsman C](#).

[Rev Bras Ortop.](#) 2017 Jun 15;52(4):442-449. doi: 10.1016/j.rboe.2017.06.003. eCollection 2017 Jun-Jul.

Lateral patellar retinacular release: changes over the last ten years.

[Fonseca LPRMD](#)¹, [Kawatake EH](#)¹, [Pochini AC](#)².

SAE - Résultats

Sports Med Arthrosc Rev. 2007 Jun;15(2):57-60.

The role of lateral retinacular release in the treatment of patellar instability.

Lattermann C¹, Toth J, Bach BR Jr.

Knee Surg Sports Traumatol Arthrosc. 2018 Nov 27. doi: 10.1007/s00167-018-5294-7. [Epub ahead of print]

Lateral retinacular release is not recommended in association to MPFL reconstruction in recurrent patellar dislocation.

Malatray M¹, Magnussen R², Lustig S^{3,4}, Servien E^{3,5}.

Knee Surg Sports Traumatol Arthrosc. 2007 May;15(5):547-54. Epub 2007 Jan 16.

Dynamic measurement of patellofemoral kinematics and contact pressure after lateral retinacular release: an in vitro study.

Ostermeier S¹, Holst M, Hurschler C, Windhagen H, Stukenborg-Colsman C.

Rev Bras Ortop. 2017 Jun 15;52(4):442-449. doi: 10.1016/j.rboe.2017.06.003. eCollection 2017 Jun-Jul.

Lateral patellar retinacular release: changes over the last ten years.

Fonseca LPRMD¹, Kawatake EH¹, Pochini AC².

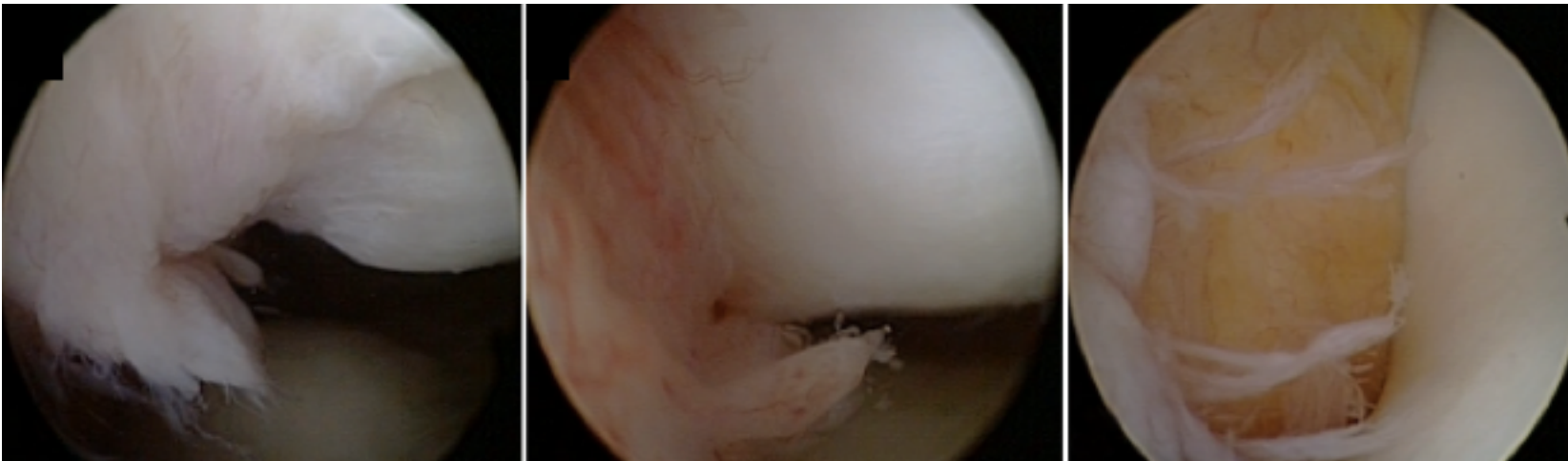
Tendinopathie Patellaire Chronique

Tendinopathie Patellaire Chronique

- Sportif haut niveau 14%
- Basket/volley
- Réfractaire au traitement conservateur > 6 mois
- Synovite pôle inférieure patella + hypertrophie Hoffa

Lian et al. AJSM 2005

Prevalence of Jumper's knee among elite athletes from different sport



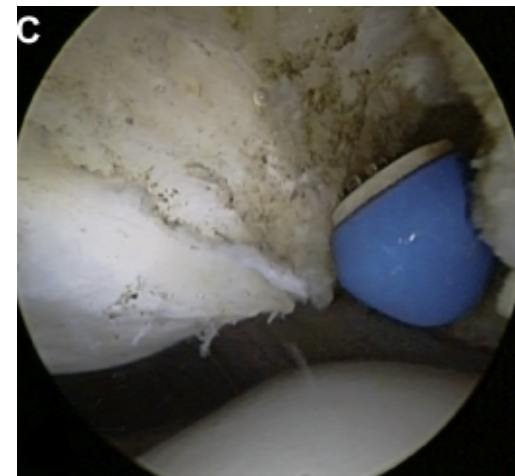
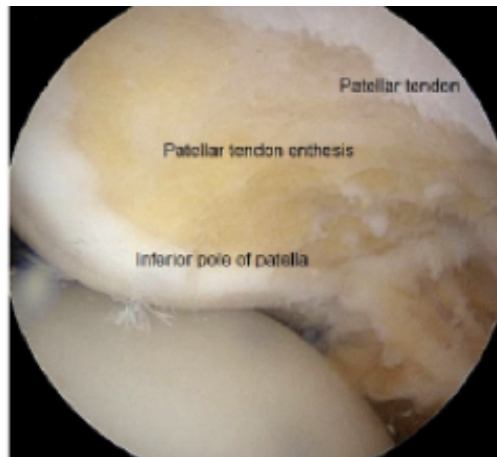
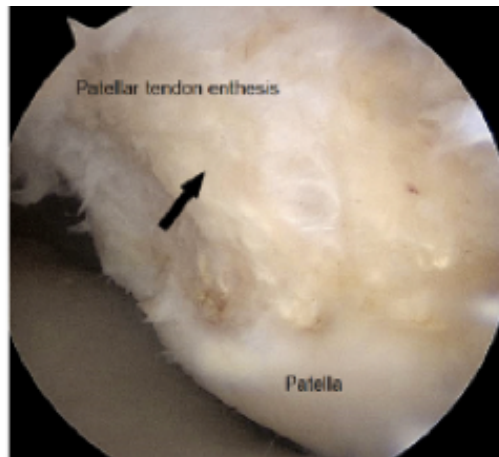
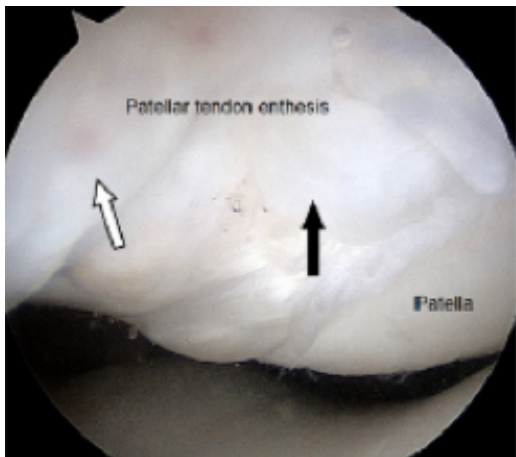
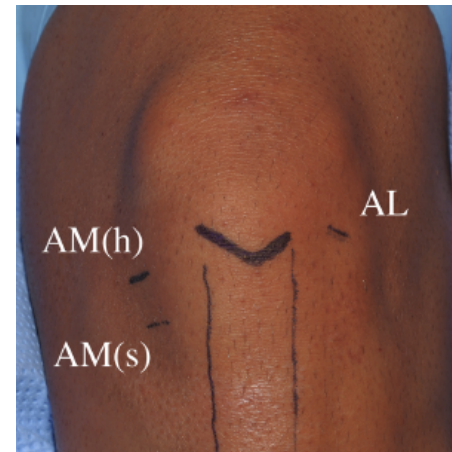
Coleman et al. AJSM 2000

Open and arthroscopic patellar tenotomy for chronic patellar tendinopathy. A retrospective outcome study



Tendinopathie Patellaire : techniques

- Synovectomie du pôle inférieur + insertion proximale du tendon
- Débridement du Hoffa
- Face profonde du ligament patellaire
- Décortication/Dénervation pôle inférieur de la patella

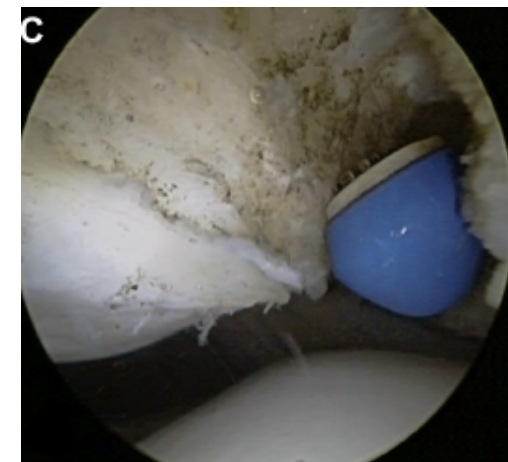
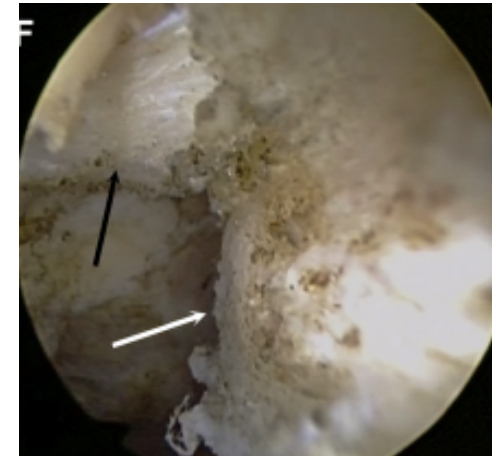
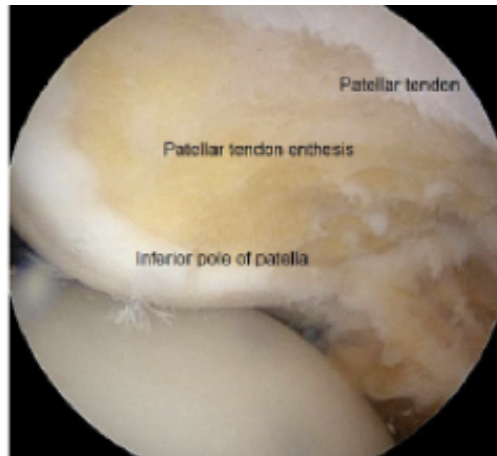
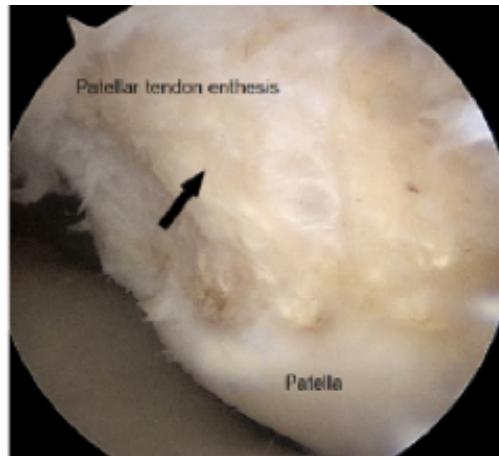
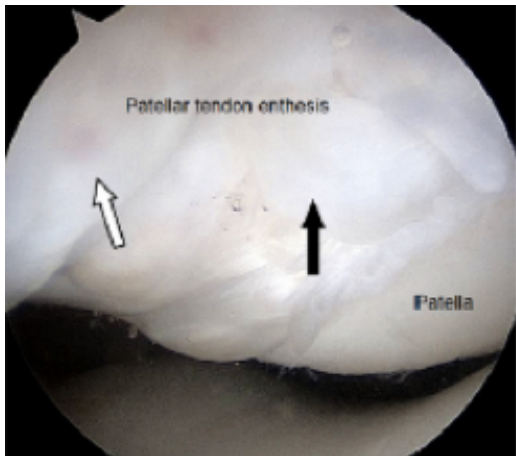


Maier et al. Arthroscopy 2013

Mid- and Long term efficacy of the arthroscopic patellar release for treatment of patellar tendinopathy

Tendinopathie Patellaire : techniques

- Synovectomie du pôle inférieur + insertion proximale du tendon
- Débridement du Hoffa
- Face profonde du ligament patellaire
- Décortication/Dénervation pôle inférieur de la patella

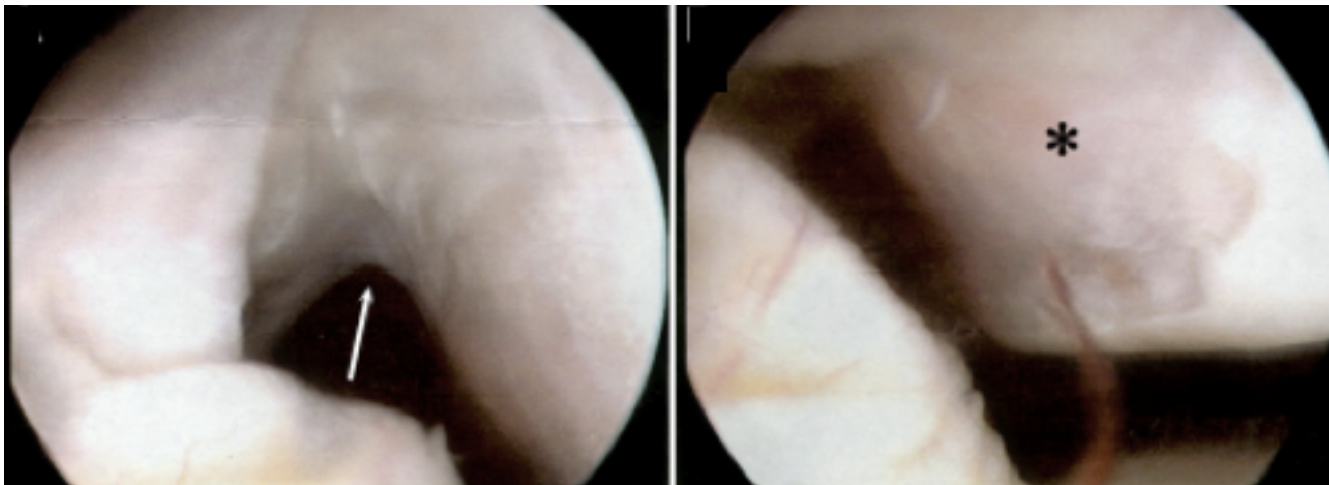


Maier et al. Arthroscopy 2013

Mid- and Long term efficacy of the arthroscopic patellar release for treatment of patellar tendinopathy

Tendinopathie Patellaire : résultats

- Bon résultats cliniques (douleur, fonction) à moyen et long terme
- Retour au sport à moyen terme (3 – 4.5 mois)
- Reprise sport niveau antérieur > 75%
- Récidive : 3 - 10%



7 ans après

Pascarella et al. AJSM 2011

Arthroscopic management of chronic patellar tendinopathy

Maier et al. Arthroscopy 2013

Mid- and Long term efficacy of the arthroscopic patellar release for treatment of patellar tendinopathy

Lee et al. Knee 2018

Refractory patellar tendinopathy treated by arthroscopic decortication of the inferior patellar pole in athletes: Mid-term outcomes.

Patellectomie Verticale Externe

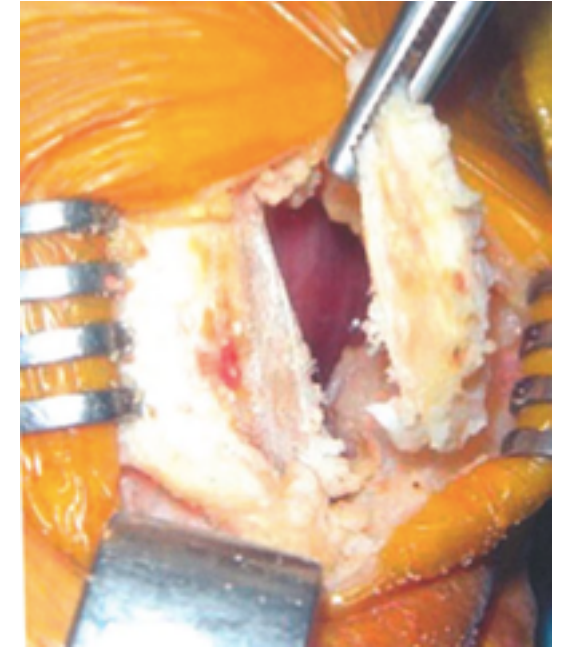
Patellectomie Verticale Externe

Objectifs:

- Exérèse verticale de la facette latérale
- Résection osseuse : 10 – 15 mm
- > Lever le conflit fémoro-patellaire externe
- > Améliorer le tracking patellaire

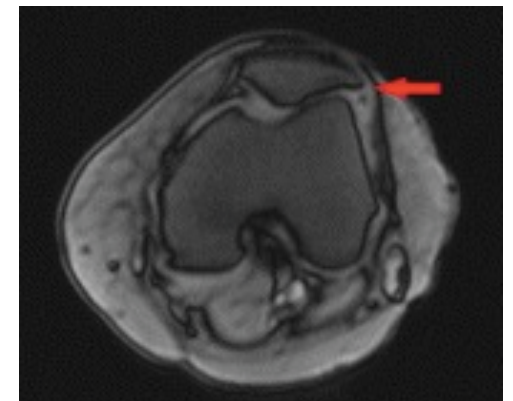
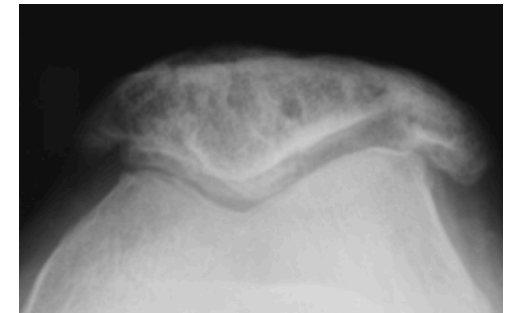
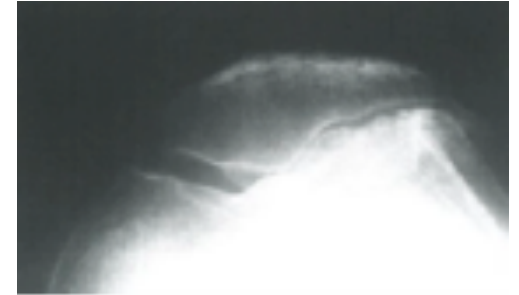
Patient idéal :

- Patient actif & jeune
- Echec du traitement médical
- Traitement non conservateur pas envisageable



PVE – Indications : Genou Natif

- Arthrose fémoro-patellaire externe isolée
- Conflit fémoro-patellaire
- Douleurs antérieures du genou



Clin Orthop Relat Res. 2005 Jul;(436):14-9.

The treatment of patellofemoral osteoarthritis with partial lateral facetectomy.

Yercan HS¹, Ait Si Selmi T, Neyret P.

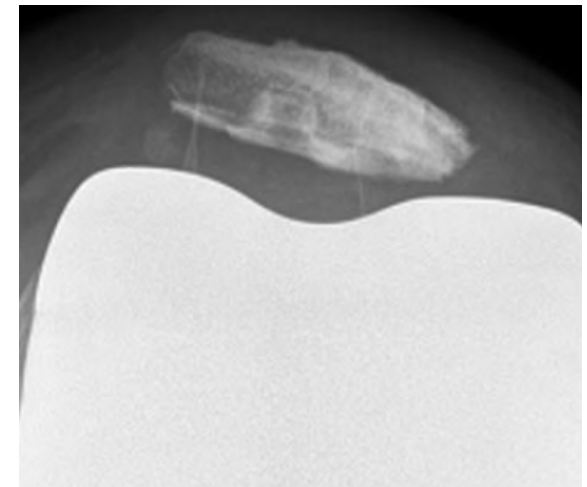
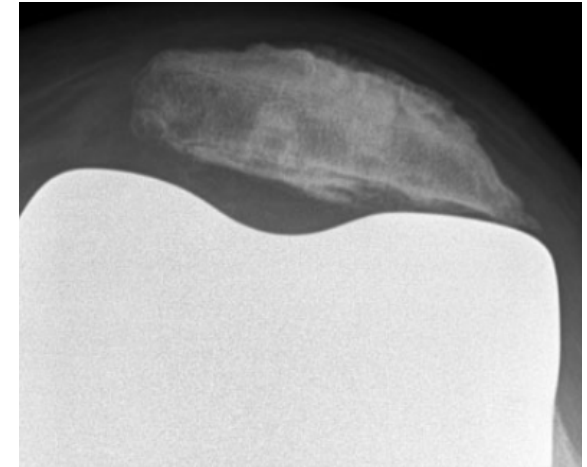
J Orthop Surg Res. 2017 Nov 14;12(1):173. doi: 10.1186/s13018-017-0676-y.

Treatment for lateral patellar impingement syndrome with arthroscopic lateral patelloplasty: a bidirectional cohort study.

Wu T¹, Tang S², Wang F³.

PVE – Indications : Genou Prothétique

- Conflit fémoro-patellaire sur patella resurfacée ou non
- Tilt patellaire
- AFP externe isolée sur patella non-resurfaçée



[J Knee Surg.](#) 2017 Feb;30(2):185-192. doi: 10.1055/s-0036-1584186. Epub 2016 May 20.

Clinical and Radiologic Outcomes of Partial Lateral Patellar Facetectomy in Total Knee Arthroplasty.

Kim CW¹, Lee CR¹, Seo SS², Gwak HC¹, Kim JH¹, Park JH¹.

[J Knee Surg.](#) 2011 Sep;24(3):181-4.

Lateral patellofemoral impingement: a cause of treatable pain after TKA.

Cercek R¹, Jacofsky D, Kieffer K, Larsen B, Jacofsky M.

[J Arthroplasty.](#) 2014 Nov;29(11):2156-62. doi: 10.1016/j.arth.2014.06.014. Epub 2014 Jun 28.

Lateral patellar facetectomy and medial reefing in patients with lateral facet syndrome after patellar-retaining total knee arthroplasty.

Pagenstert G¹, Seelhoff J², Henninger HB³, Wirtz DC⁴, Valderrabano V¹, Barg A¹.

PVE- Littérature

Knee. 2012 Aug;19(4):411-5. doi: 10.1016/j.knee.2011.04.005. Epub 2011 May 18.

Patellofemoral osteoarthritis treated by partial lateral facetectomy: results at long-term follow up.

Wetzels T¹, Bellemans J.

-> Taux de survie sans nouvelle opération (PTG):

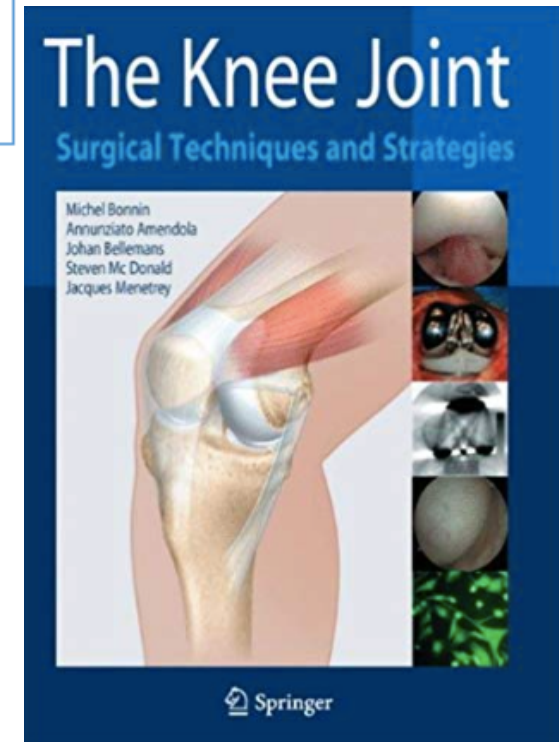
- 85% à 5 ans
- 67,2% à 10 ans
- 46,7% à 20 ans
- Bons résultats cliniques

J Bone Joint Surg Br. 1994 May;76(3):485-7.

Knee function after patellectomy. A 12- to 48-year follow-up.

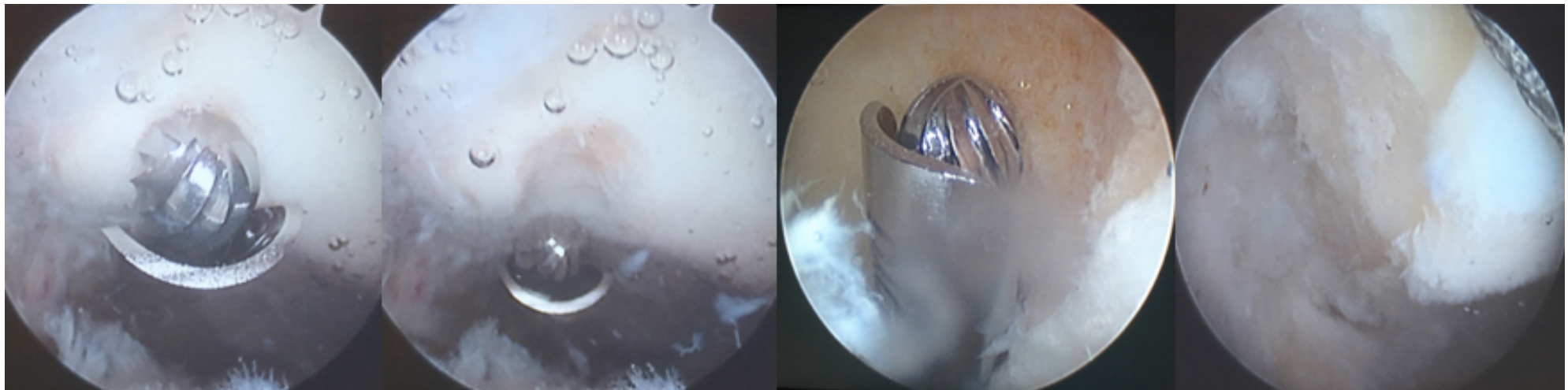
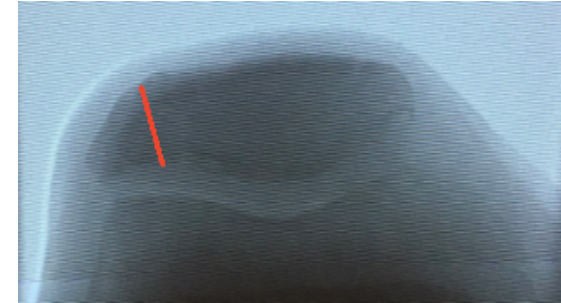
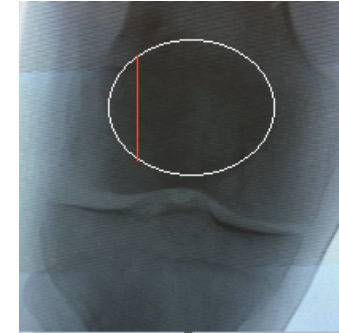
Lennox IA¹, Cobb AG, Knowles J, Bentley G.

- Recul 14 – 50 ans
- 76% de bon résultats
- Patients satisfaits



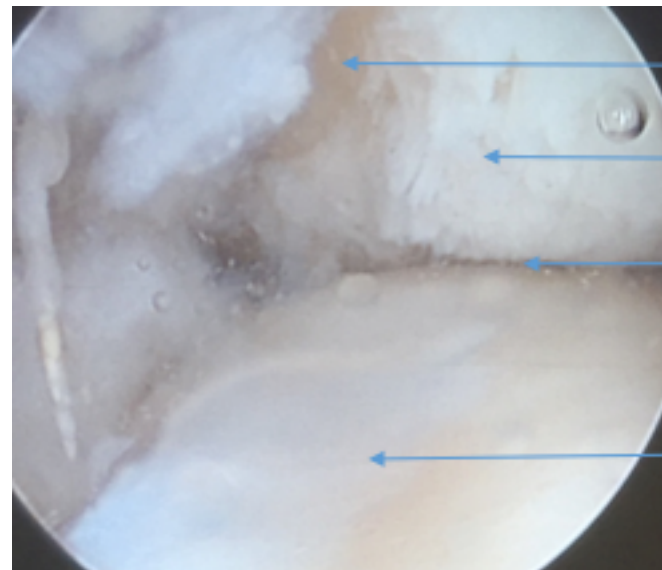
PVE Arthroscopique

- Etude cadavérique
- Amplificateur de brillance
- Genou en extension
- Voies Antérolatérale & Supérolatérale
- Fraise motorisée



PVE Arthroscopique

- Repères peropératoires **dynamiques** +++
 - Conflit fémoro-patellaire
 - Instabilité patellaire médiane
 - Course rotulienne
 - Engagement dans la trochlée



Os sous-chondral patellaire (zone fraisée)

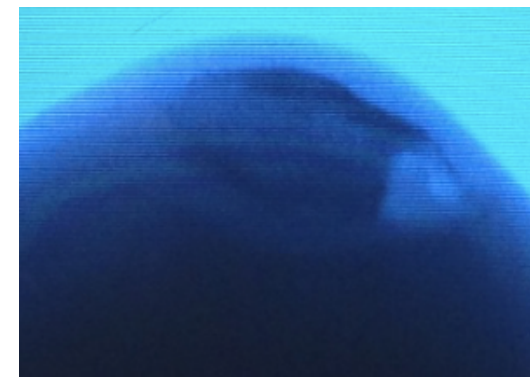
Surface articulaire patellaire

Interligne articulaire fémoro-patellaire

Surface articulaire trochléenne

PVE arthroscopique : Avantages/Difficultés

Avantages	Inconvénients/difficultés
Rapidité	Obésité
Courbe d'apprentissage	Résection corticale antérieure
Morbidité	Os dense/scléreux
Bilan intra-articulaire complet	Lésion du tissu sous-cutané
Réalisation de gestes associés	
Evaluation perop dynamique	
Risque infectieux (PTG)	



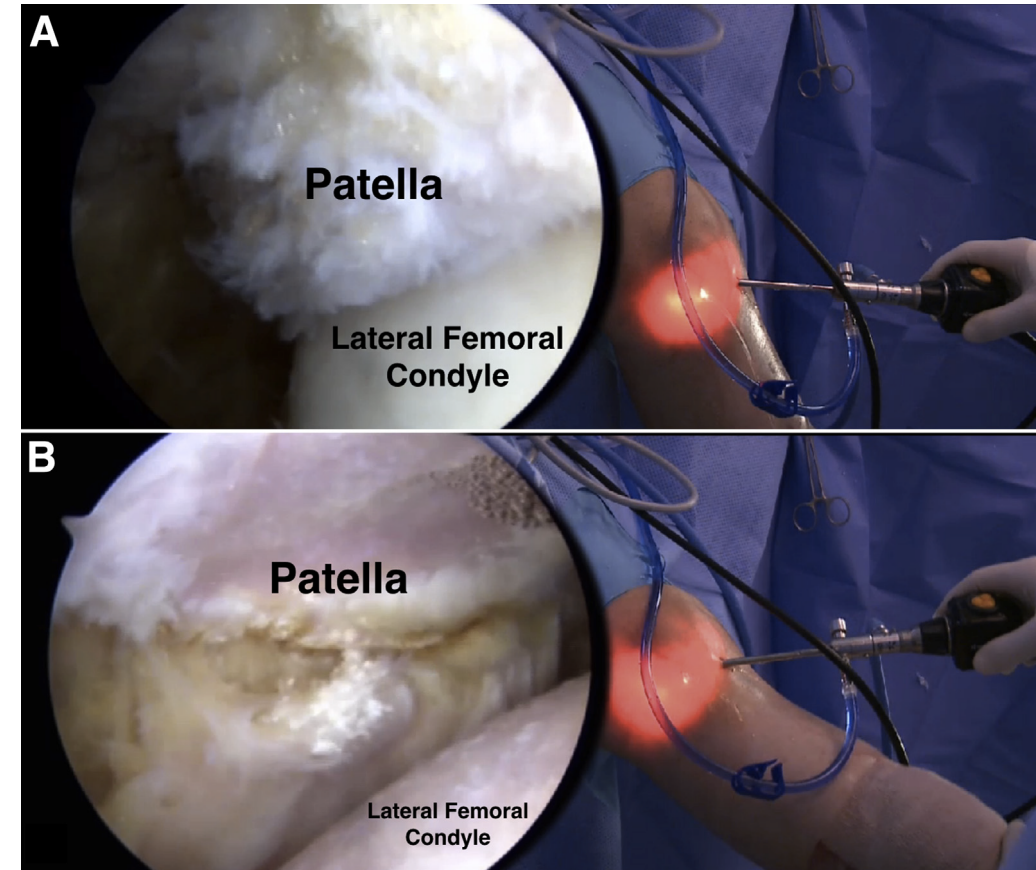
PVE Arthroscopique - littérature

Arthrosc Tech. 2017 Mar 20;6(2):e357-e362. doi: 10.1016/j.eats.2016.10.002. eCollection 2017 Apr.

Arthroscopic Patellar Lateral Facetectomy.

Ferrari MB¹, Sanchez G¹, Chahla J¹, Moatshe G¹, LaPrade RF^{1,2}.

- AFP isolée -> facettectomie latéral arthroscopique +++
- Evaluation dynamique visuelle
 - course rotulienne
 - Absence de conflit
- Moins de douleurs antérieures



Trochléoplastie Arthroscopique

Trochléoplastie Arthroscopique – Indications

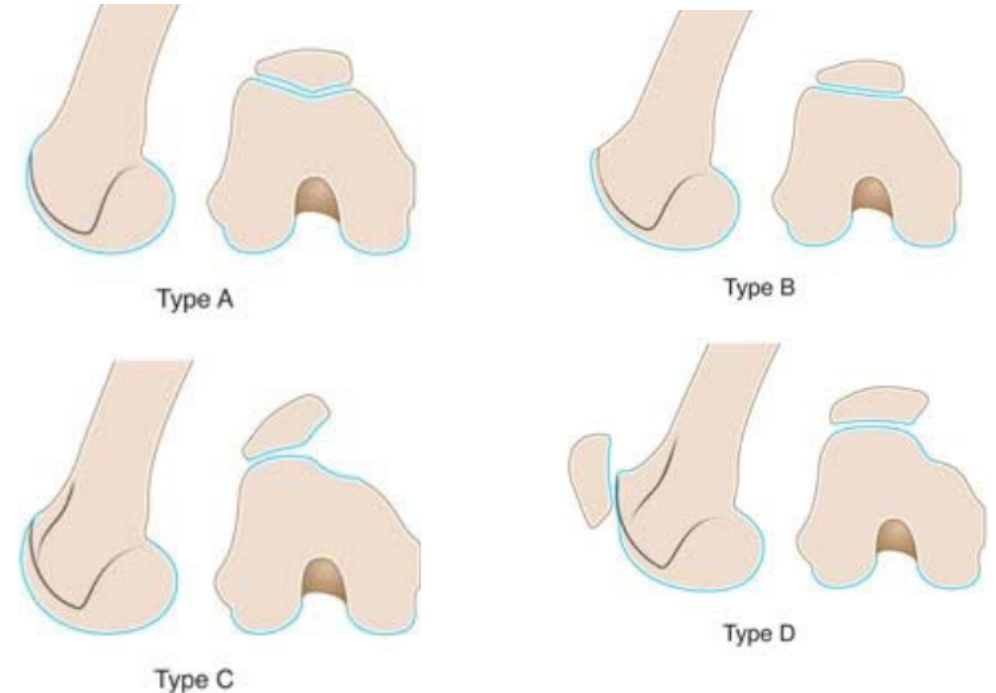
- Instabilité patellaire chronique
- Course rotulienne (J sign)
- Appréhension entre 0 - 30°
- Dysplasie de trochlée grade B/C/D
- Absence de lésion chondrale

Dejour et al. KSSTA 1994

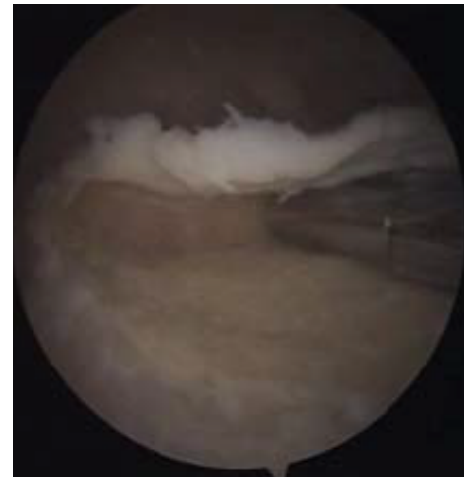
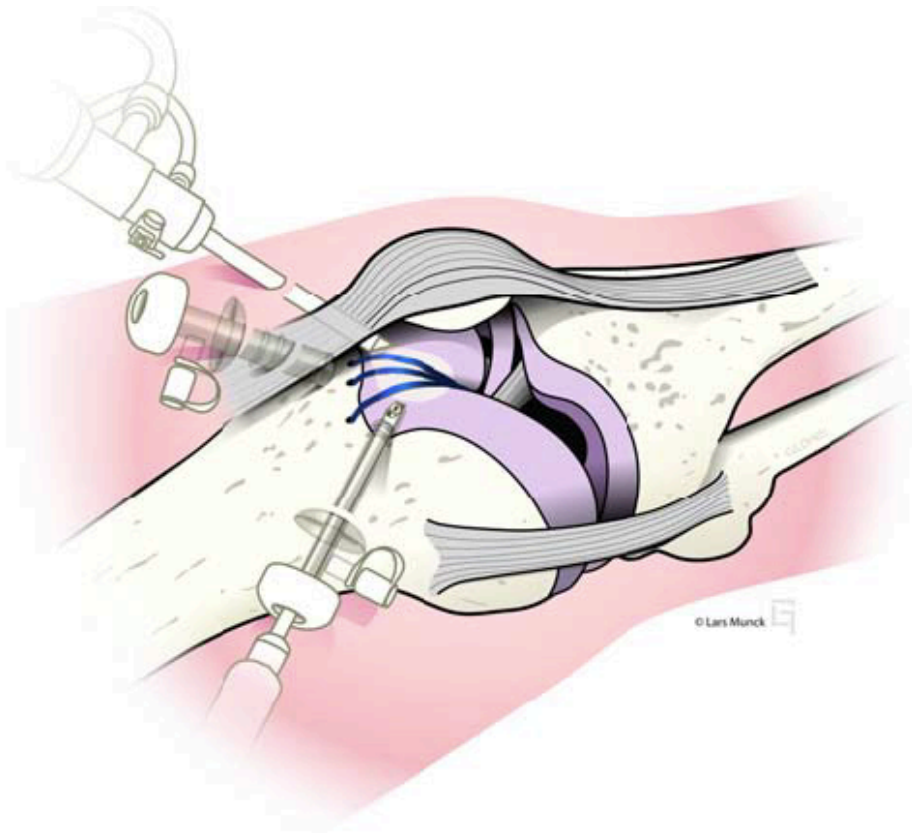
Factors of patellar instability : an anatomic radiographic study

Utting et al. JBJS 2008

A prospective evaluation of trochleoplasty for the treatment of patellofemoral dislocation and instability



Trochléoplastie Arthroscopique – Technique

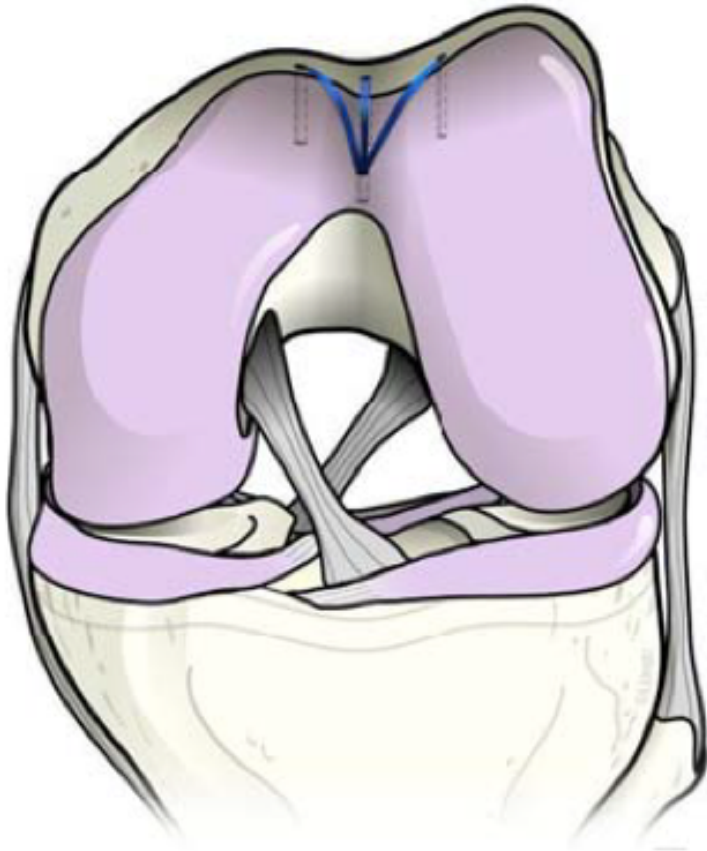


[Knee Surg Sports Traumatol Arthrosc.](#) 2010 Apr;18(4):480-5. doi: 10.1007/s00167-009-0935-5. Epub 2009 Oct 14.

The arthroscopic deepening trochleoplasty.

[Blønd L¹](#), [Schöttle PB.](#)

Trochléoplastie Arthroscopique – Technique



[Knee Surg Sports Traumatol Arthrosc.](#) 2010 Apr;18(4):480-5. doi: 10.1007/s00167-009-0935-5. Epub 2009 Oct 14.

The arthroscopic deepening trochleoplasty.

[Blønd L¹](#), [Schöttle PB](#).

Trochléoplastie Arthroscopique

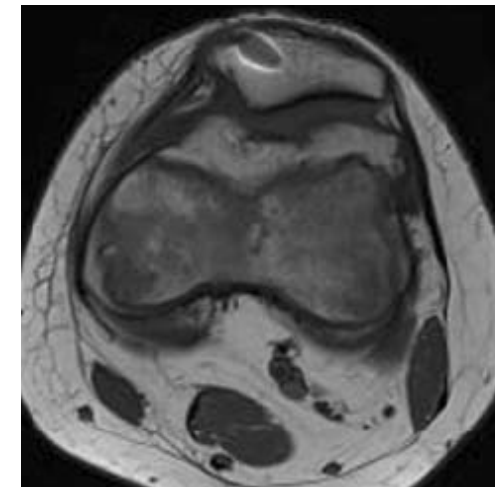
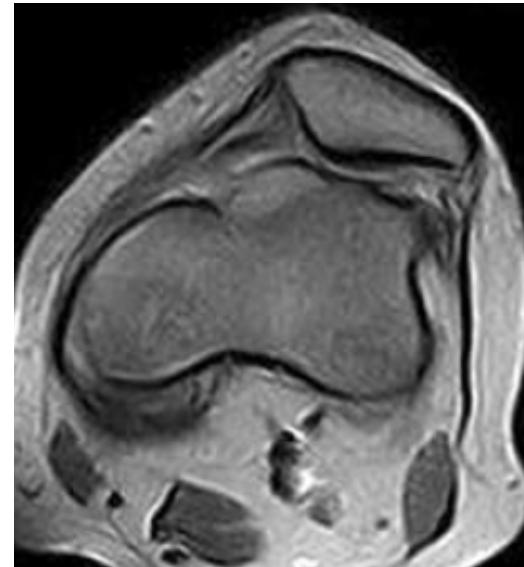
- Avantages:

- Moins de douleur
- Mobilisation précoce
- Moins de raideur
- Pas d'arthrotomie



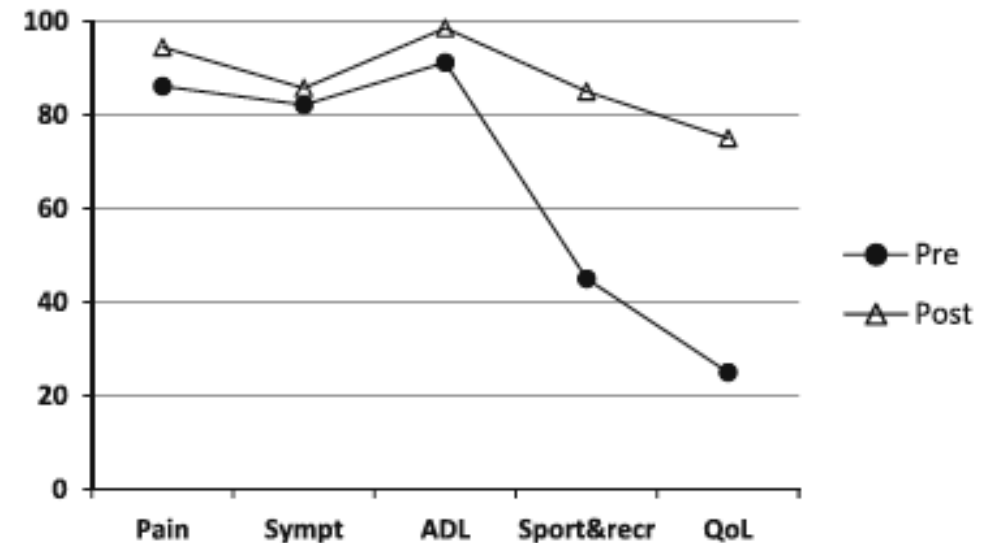
- Inconvénients:

- Difficulté technique
- Durée (>2h)
- Estimation de la correction trochléenne



Trochléoplastie Arthroscopique - littérature

- Pas de complications:
 - Luxation
 - Arthrofibrose
 - Nécrose cartilagineuse
- Amélioration des scores fonction/douleur
- Reconstruction MPFL systématiquement



Pre & Post comparison	Pain	Symptoms	ADL	Sports/Rec	QOL
Two-tailed p value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Knee Surg Sports Traumatol Arthrosc. 2014 Oct;22(10):2484-90. doi: 10.1007/s00167-013-2422-2. Epub 2013 Feb 1.

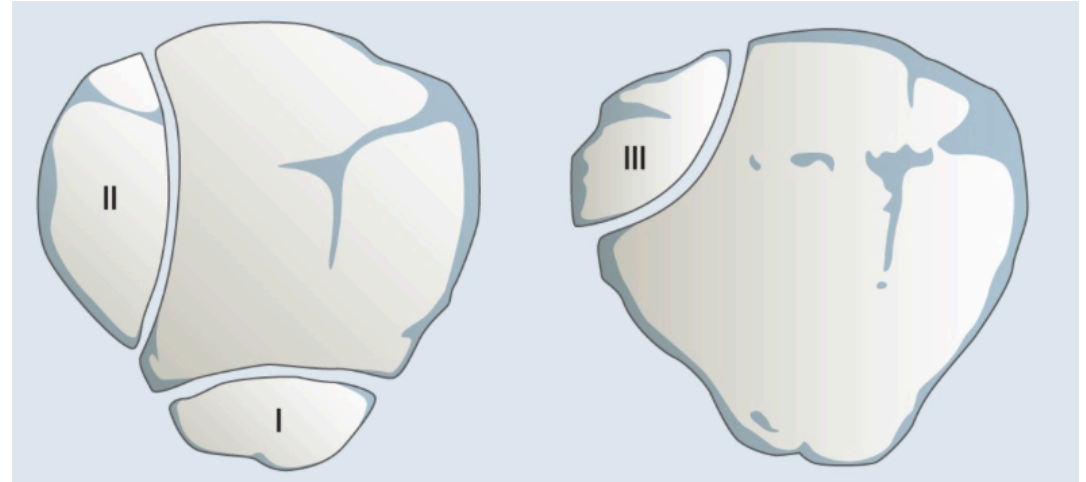
Combined arthroscopic deepening trochleoplasty and reconstruction of the medial patellofemoral ligament for patients with recurrent patella dislocation and trochlear dysplasia.

Blønd L¹, Haugegaard M.

Patella Bi-Partita

Patella Bipartita

- 1 – 2%
- Classification de Saupe
- Sportifs+++



- Douleurs fémoro-patellaires/inconfort antérieur
- Tractions répétées (app ext/Rétinaculum latéral) sur la fragment accessoire -> micromouvements

Patella Bipartita - littérature

- Résection arthroscopique chez sportifs
- Patella bipartita résistante/invalidante
- A 1 an :
 - Asymptomatique
 - Reprise sport

Arthroscopy. 2005 Aug;21(8):1006.

Arthroscopic excision of a painful bipartite patella fragment.

Azarbod P¹, Agar G, Patel V.

Knee Surg Sports Traumatol Arthrosc. 2011 Mar;19(3):398-9. doi: 10.1007/s00167-010-1229-7. Epub 2010 Aug 13.

Arthroscopic treatment of symptomatic bipartite patella.

Felli L¹, Fiore M, Bigliani L.

Orthopedics. 2008 Jul;31(7):717.

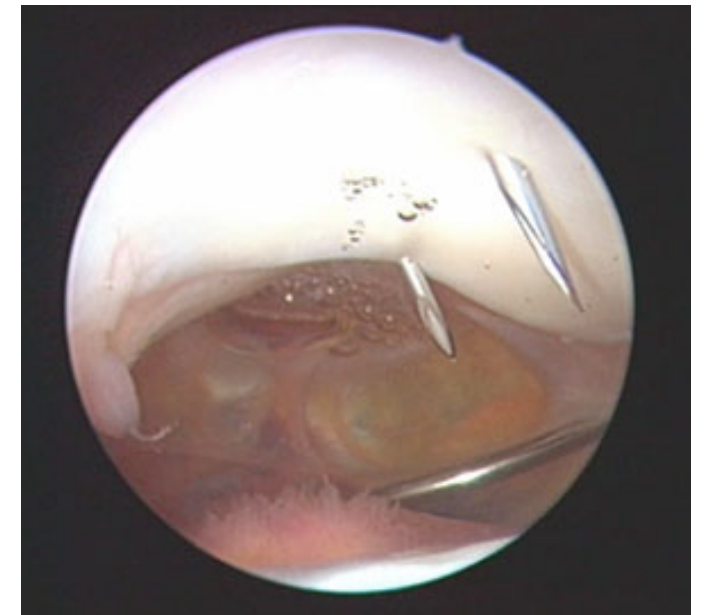
Arthroscopic removal of separated bipartite patella causing snapping knee syndrome.

Yoo JH¹, Kim EH, Ryu HK

Arthroscopy. 2018 May;34(5):1550-1558. doi: 10.1016/j.arthro.2017.11.038. Epub 2018 Feb 15.

Clinical Outcome of Arthroscopic Lateral Retinacular Release for Symptomatic Bipartite Patella in Athletes.

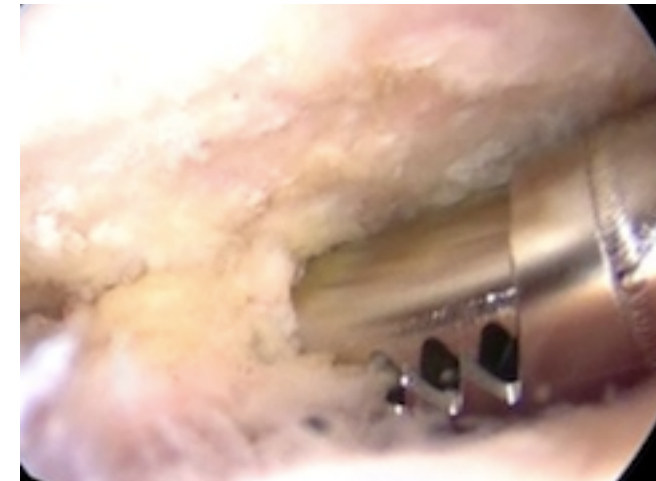
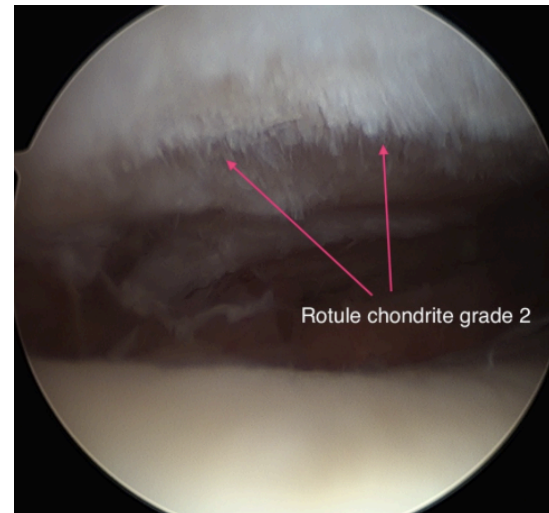
Felli L¹, Formica M¹, Lovisolio S¹, Capello AG¹, Alessio-Mazzola M².



Cartilage Patellaire

Chondroplastie

- Débridement : lésions fibrillaires, flaps cartilagineux
- Microperforation
- Mosaicplastie sous arthroscopie (???)



Ostéochondrite disséquante

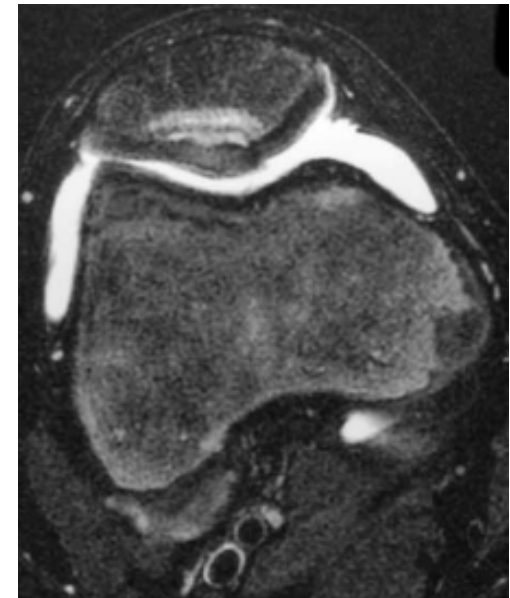
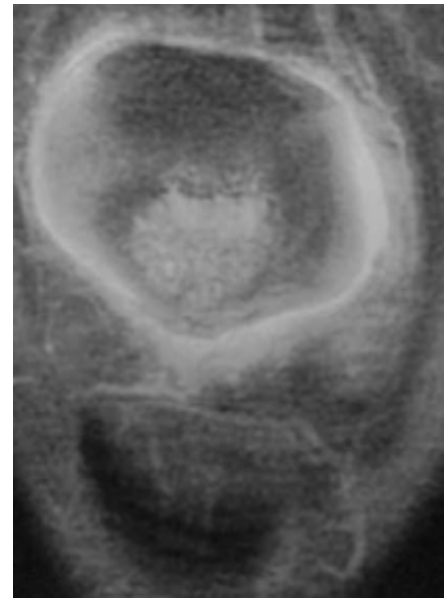
- Patella : 5 – 10% des OCD
- Indications:
 - Stabilité de la lésion (Arthro-TDM/IRM)
 - Chronicité
 - Os sous-chondral
 - Forme adulte vs juvénile

Kocher et al. AJSM 2006

Management of osteochondritis dissecans of the knee : current concepts review.

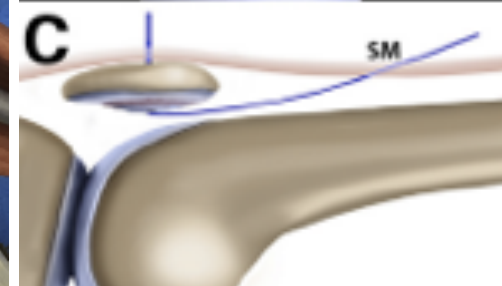
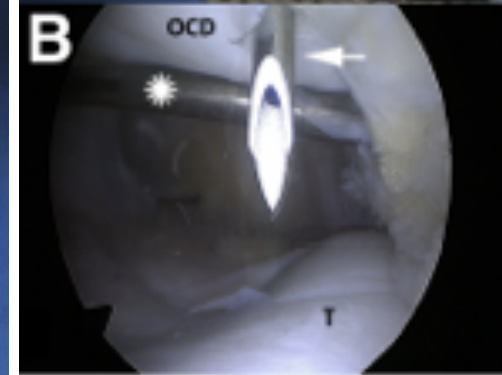
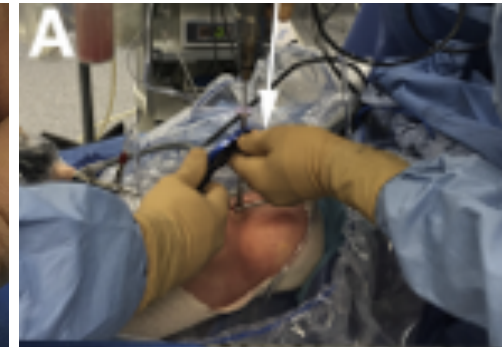
Sekiya et al. Arthroscopy 2003

Arthroscopically assisted retrograde fixation of patellar osteochondritis dissecans using fluoroscopic guidance



OCD : technique chirurgicale

- 4 voies d'abord
- Viseur LCP au centre du fragment d'OCD
- 1 tunnel central : Broche de 2.4
- Plusieurs tunnels périphériques



[Arthrosc Tech.](#) 2017 Jul 17;6(4):e1021-e1027. doi: 10.1016/j.eats.2017.03.017. eCollection 2017 Aug.

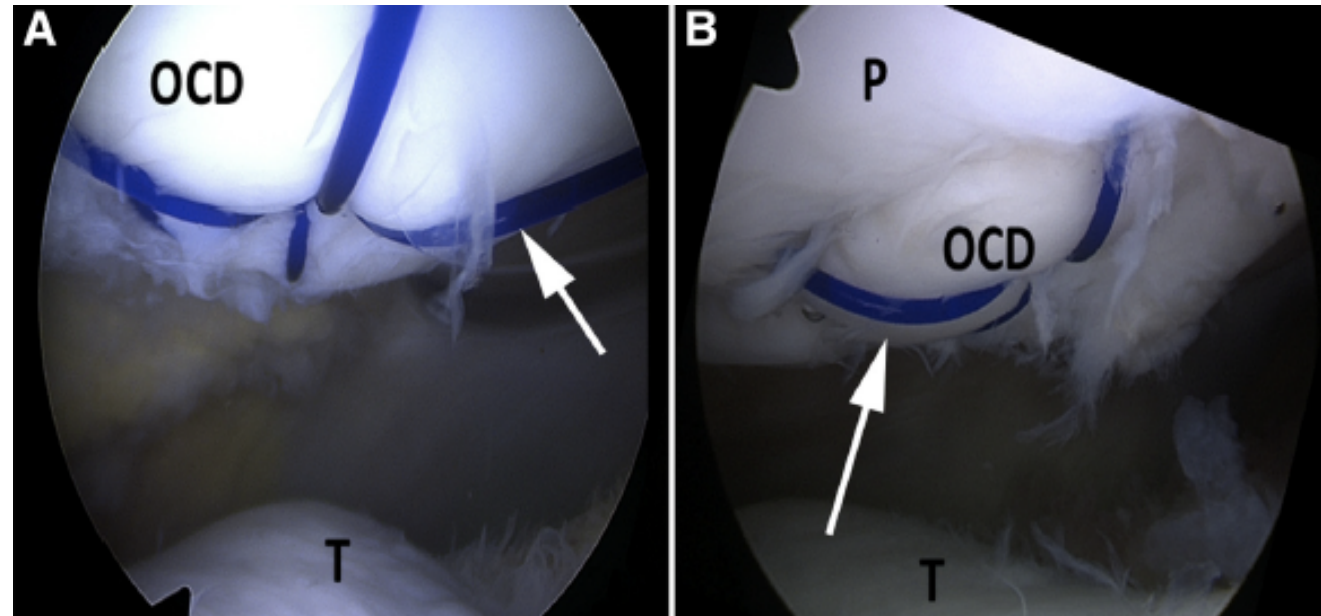
All-Arthroscopic Suture Fixation of Patellar Osteochondritis Dissecans.

Barth J¹, Brossard P¹, Boutsiadis A¹, Tardy N¹, Panisset JC¹, Seil R^{2,3}.

OCD : technique chirurgicale

- Ostéo-fixation type “Spider-Parachute- Type” au PDS 1
- Suture du Rétinaculum Patellaire
- Flexion max 90°

Avantages	Inconvénients
Contrôle visuel direct	Fragmentation/ Instabilité
Compression direct verticale	Avivement -
Suture résorbable	Gêne avec le nœuds (6 mois)
Arthrotomie -	Lésions trochlée iatrogènes (vis/agrafes)
Instabilité patellaire -	



Conclusion

- Nombreuses indications
- Techniquement difficile
- Morbidité moins importante
- Moins reproductible
- Manque d'études comparatives

Merci