

Patellar Tendon Tenodesis in Association with Tibial Tubercle Distalization for Patella Alta

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What Causes Patellar Instability?

- Numerous factors contribute to the development of patellar instability
 - Anatomy
 - Trochlear dysplasia
 - Position of the tibial tubercle (TT-TG)
 - Patellar tilt
 - Status of medial soft tissue restraints (MPFL)
 - **Patella Alta**
 - Trauma
 - Often in the absence of anatomic abnormalities

H Dejour et al, RCO, 1990

Desio et al, AJSM, 1998

Patella Alta

- Patella alta is a frequently ignored cause of patellar instability
 - Patella alta is present in:
 - 24% of patients with patellar instability
 - 3% of patients with stable patellae
 - Patella alta rarely occurs in isolation
 - frequently associated with trochlear dysplasia
 - Patients who suffer a dislocation with minimal trauma are more likely to have patella alta

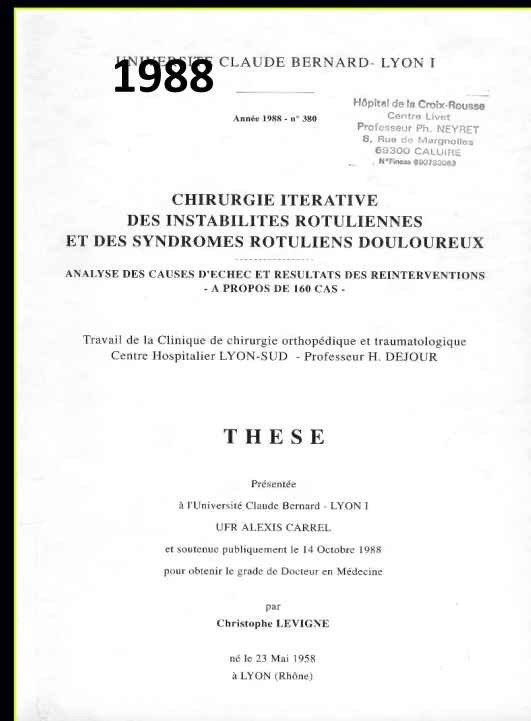
H Dejour et al, KSSTA, 2002

J Caton et al, RCO, 1990

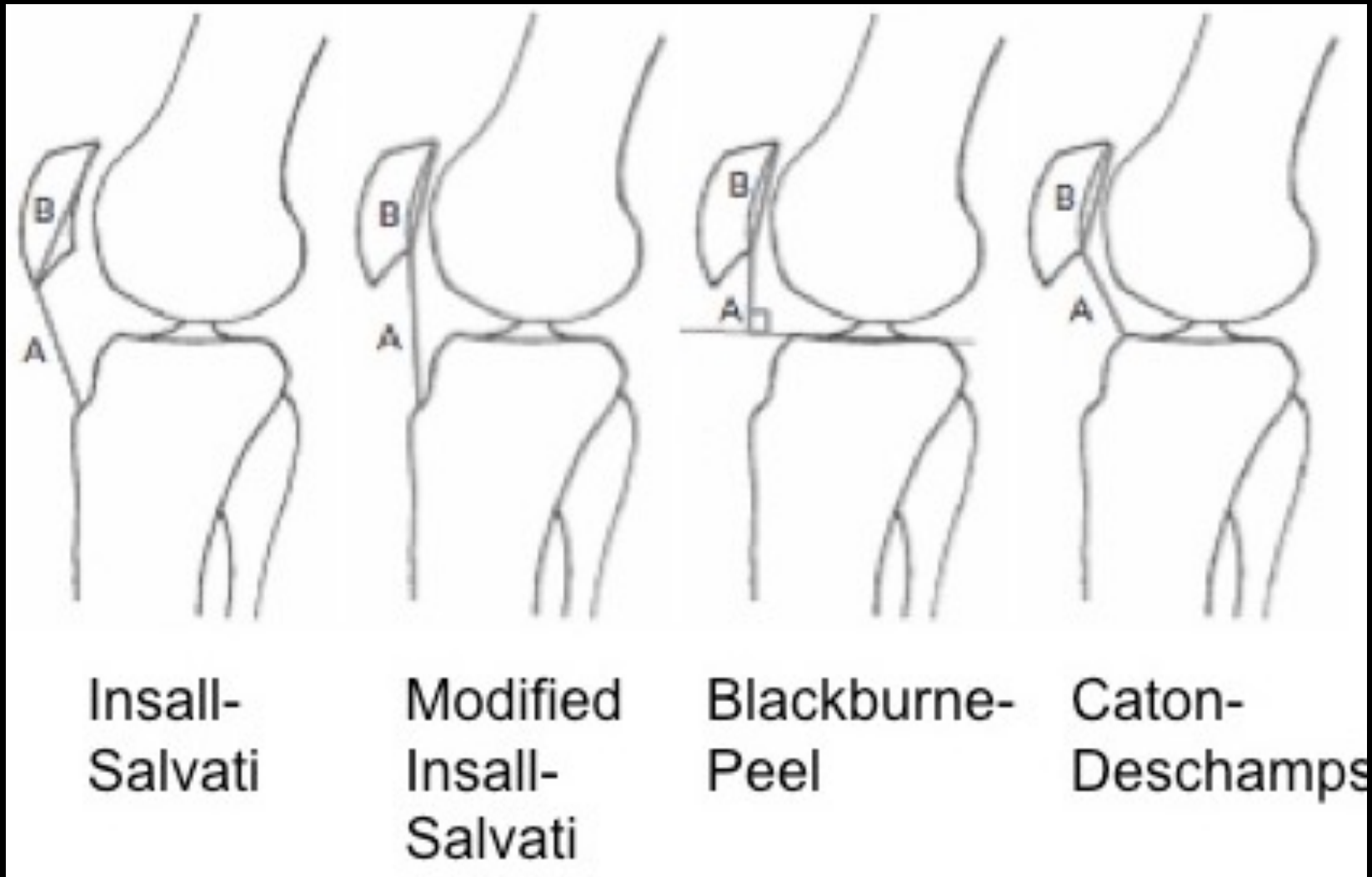
H Dejour et al, RCO 1990

Patella Alta

- Perhaps even more significant, up to 40% of cases of recurrent instability following surgery may be related to failure to address **patella alta**



How to Measure Patellar Height?



Caton & Deschamps Index



CATON J., DESCHAMPS G., CHAMBAT P. & al.:
Les Rotules Basses. A propos de 128 observations
Rev Chir Orthop 1982; 68: 317/325

Choice of Index



Caton-Deschamps = 1.4

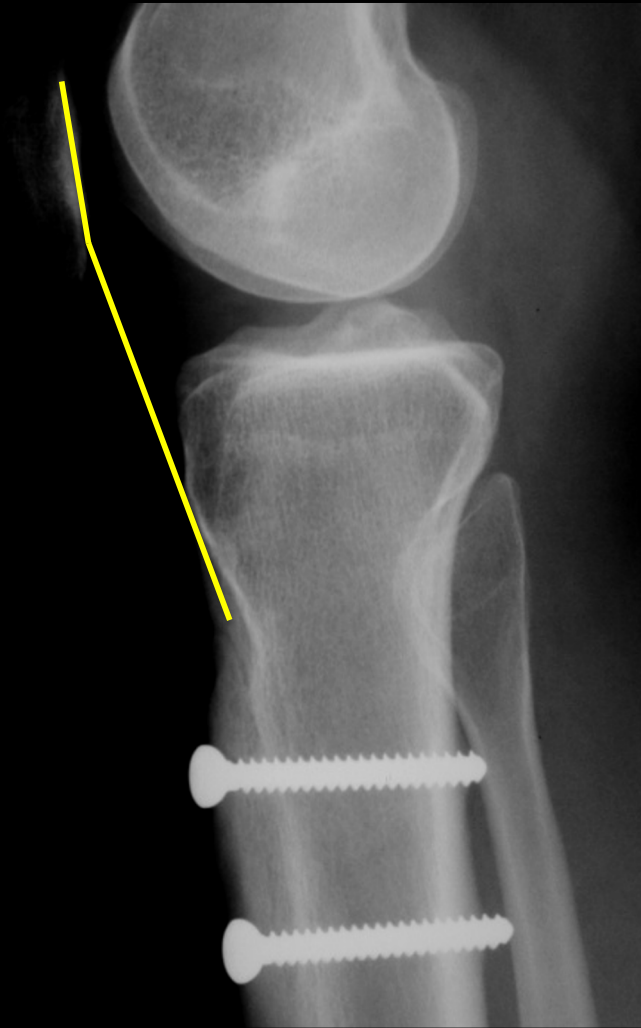


Caton-Deschamps = 1.0

Choice of Index



Caton-Deschamps = 1.4
Modified Insall-Salvati = 2.3



Caton-Deschamps = 1.0
Modified Insall-Salvati = 2.2

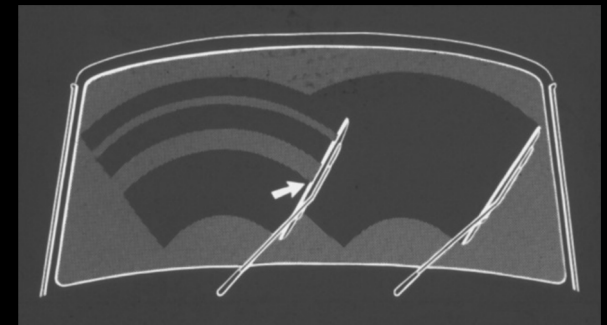


Pathoanatomy - Theory #1

- In patella alta, the patella does not engage the trochlea until higher flexion than normal
- This leads to less resistance of the patella to lateral translation
- Distalization of the patella should lead to earlier engagement of the trochlea and more resistance to lateral translation (dislocation)

Pathoanatomy - Theory #2

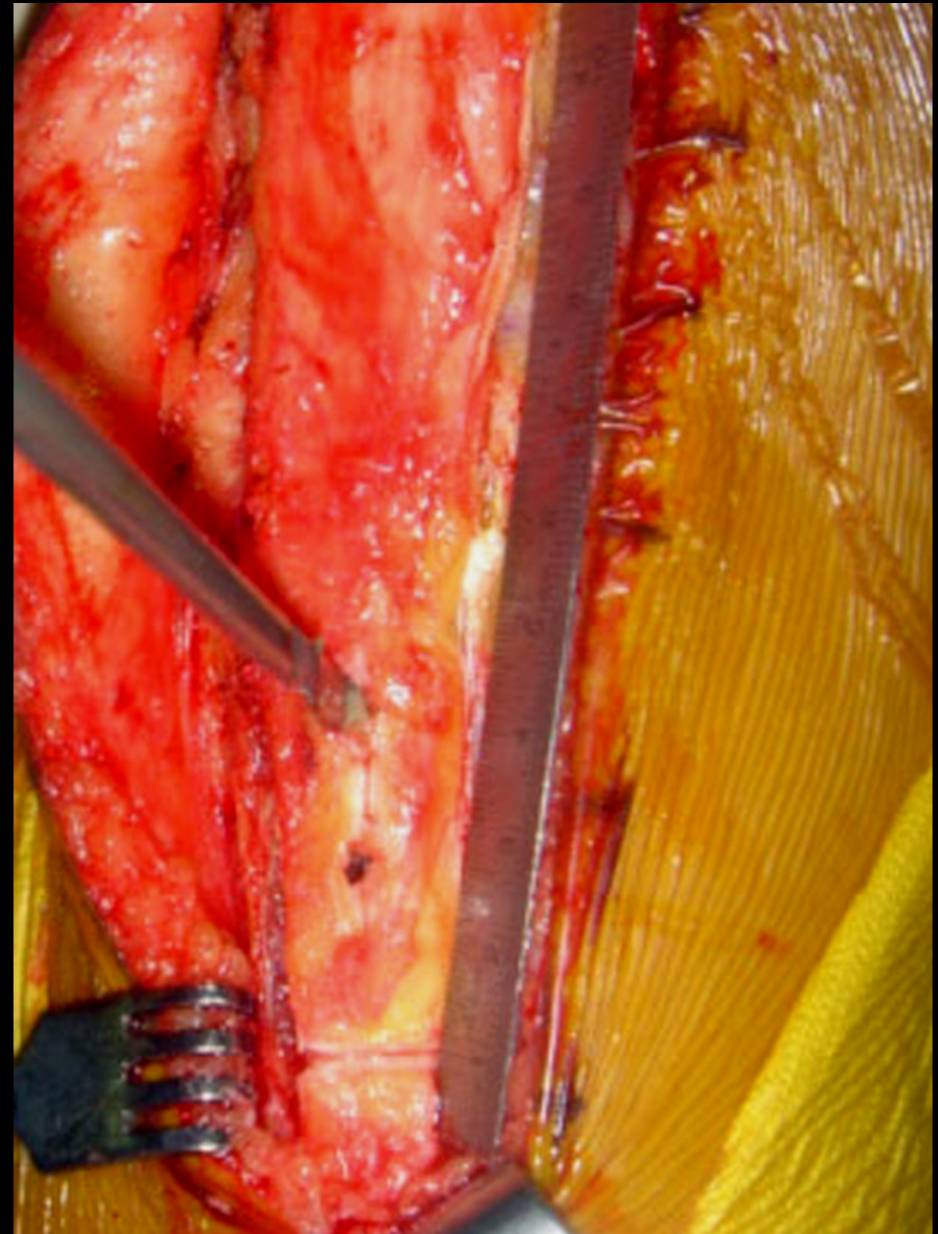
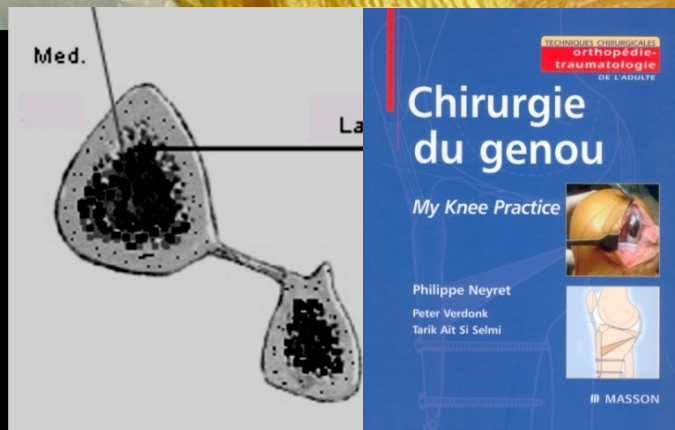
- In patella alta, the abnormally increased length of the patellar tendon itself is the culprit
- It is noted in cases of patella alta that the patellar tendon itself is frequently long rather than the tibial tubercle being too high



Operative Treatment Options

- Tibial tubercle osteotomy
 - Distalization
 - In patients with relatively normal TT-TG
 - Pure distalization of the tibial tubercle results also in some medialization of the patella (4mm average)
 - Medialization and distalization
 - May be needed in patients with significant patella alta and lateralized tibial tubercle (high TT-TG)

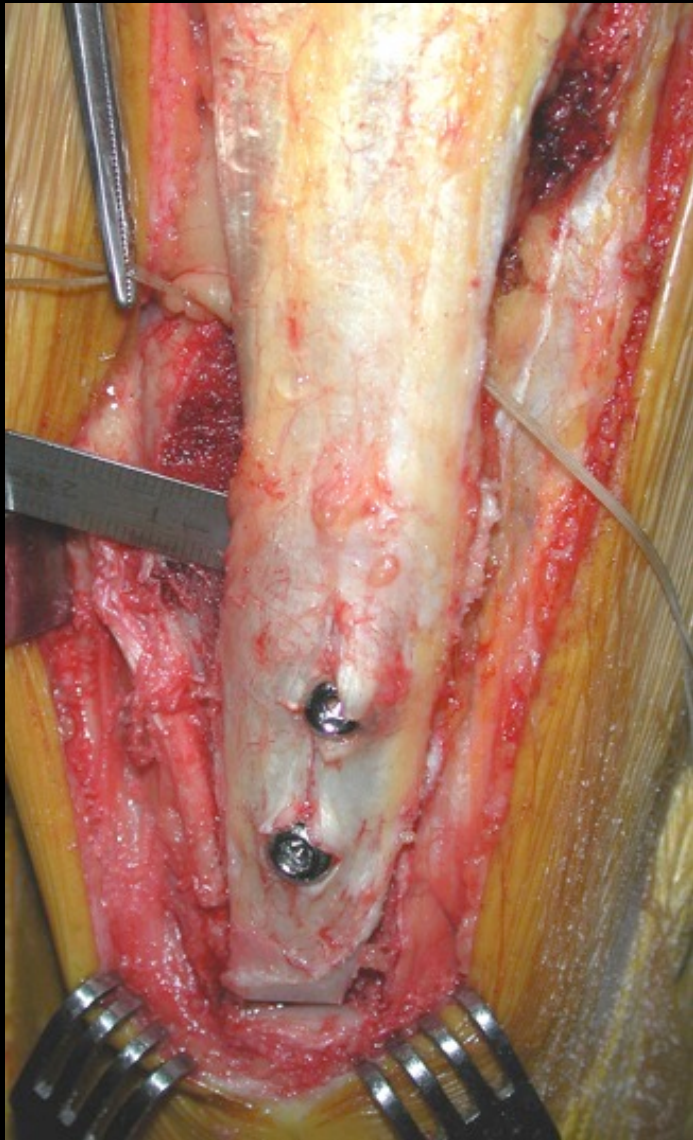
Technique



Technique



Technique

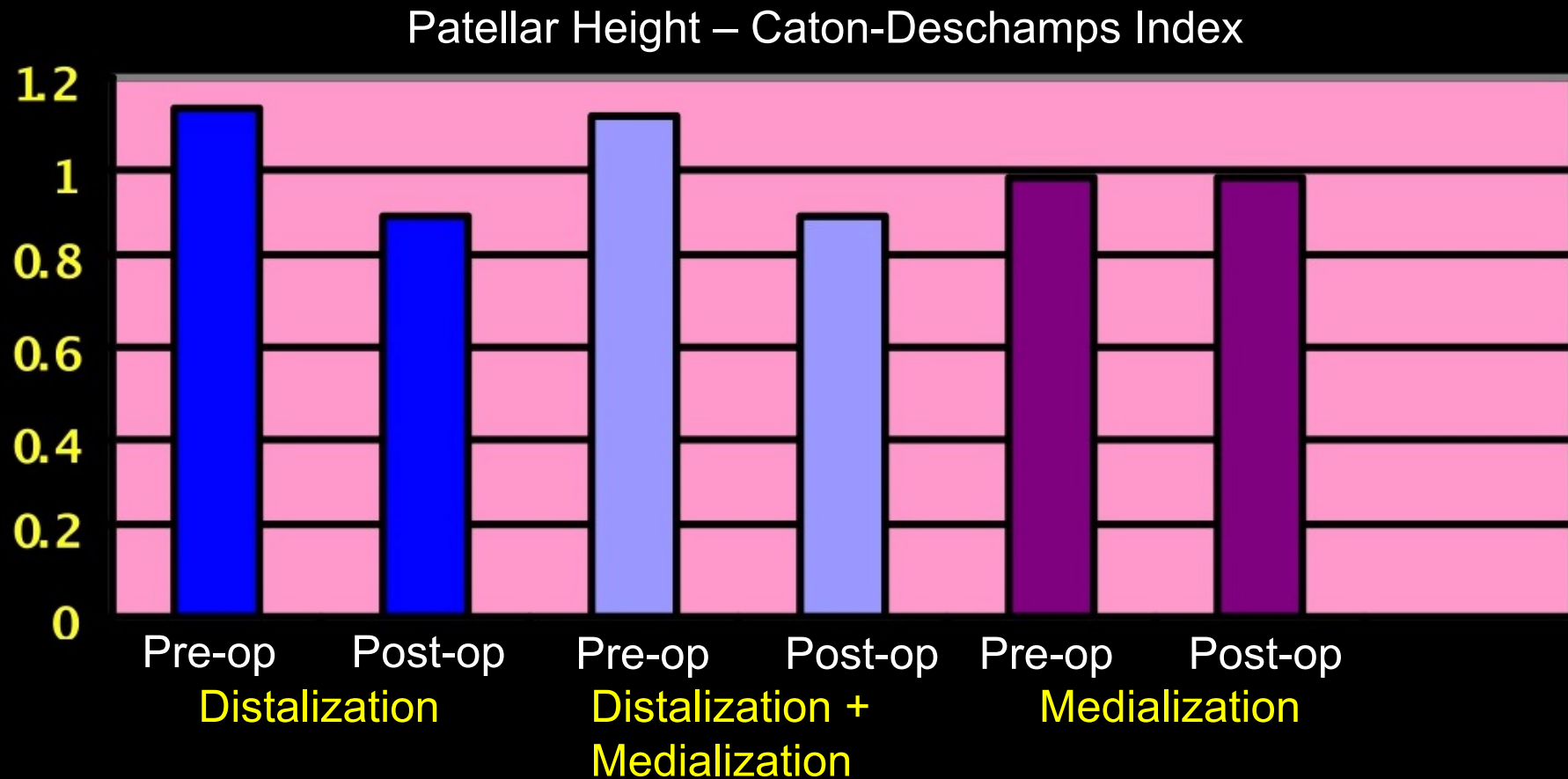


Operative Treatment Options

- Tibial tubercle osteotomy – Medialization?
 - Primarily indicated for patients with tibial tubercle lateralization
 - Some authors report that isolated medialization results in patellar tendon shortening as well – perhaps due to scar tissue formation
 - Data from Lyon Croix Rousse have not demonstrated shortening of the patellar tendon provided post-operative mobilization begins immediately

Operative Treatment Options

- Tibial tubercle osteotomy



Is tibial tubercle distalization enough?

- Addresses patella alta, but...
- No effect on patellar tendon length

Patellar Tendon Length

Study	Control	Episodic Patellar Dislocation
Escala et al	44.4 mm	51.8 mm
Neyret et al	46 mm	53 mm
Kujala et al	47 mm	51 mm
Maenpaa et al	55 mm	61 mm

Escala et al, KSSTA, 2006

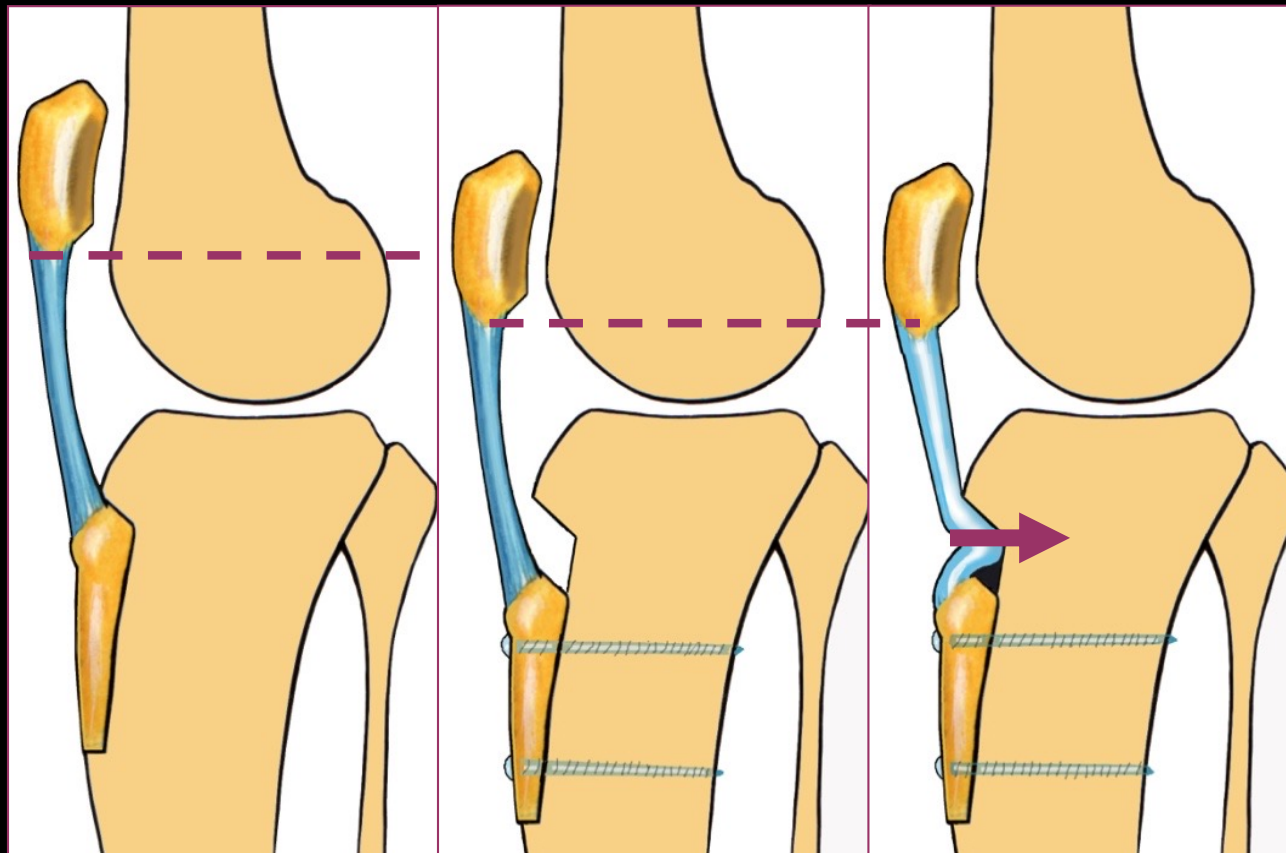
Neyret et al, Knee, 2002

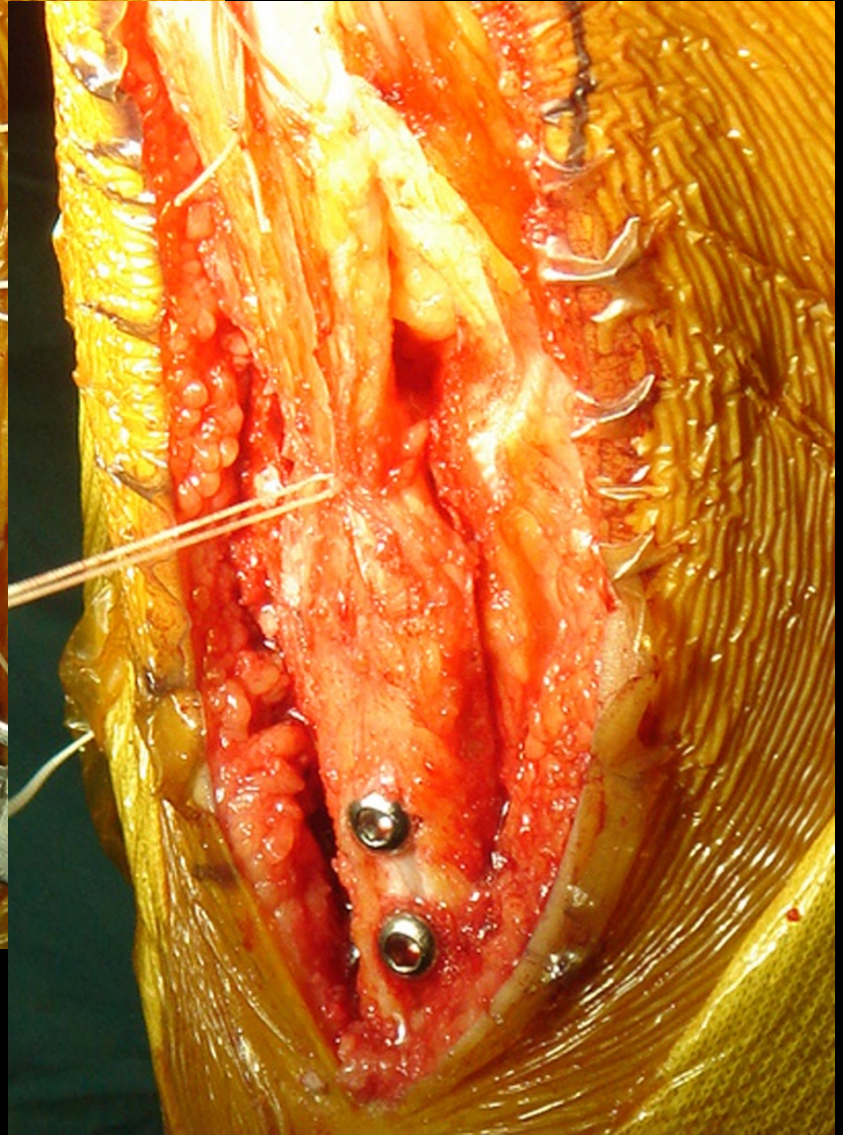
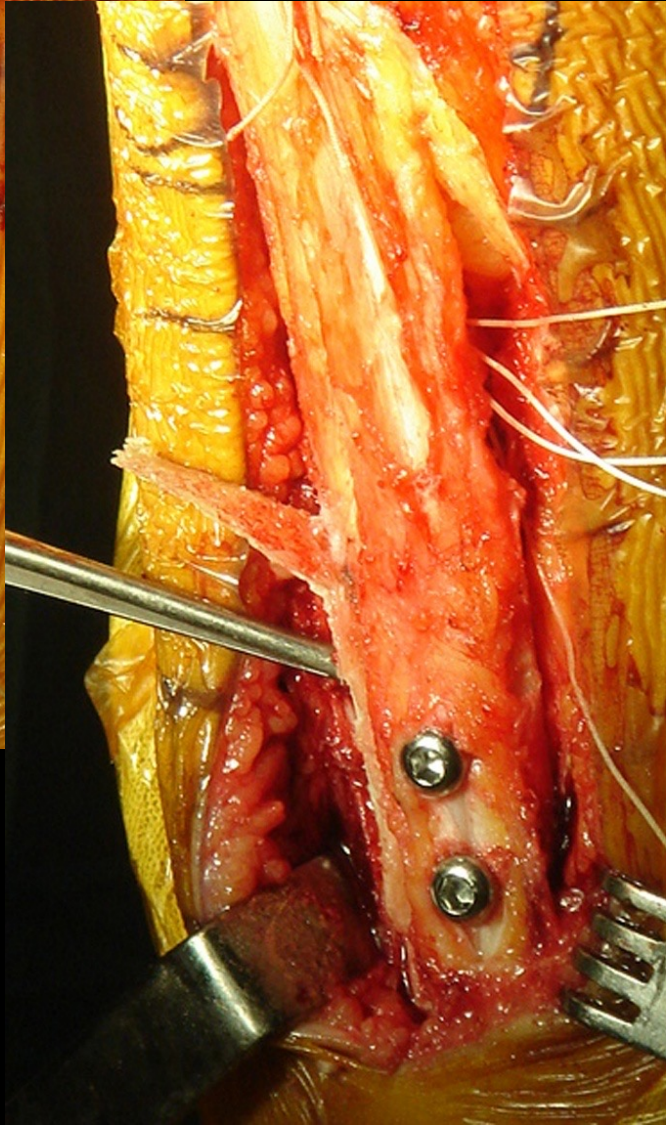
Kujala et al, JBJS-Br, 1989

Maenpaa et al, KSSTA, 1996

What about treating increased patellar tendon length??

- Consider the addition of a patellar tendon tenodesis to a tibial tubercle distalization





Results – Lyon Series

- Tibial tubercle osteotomy with patellar tendon tenodesis
- 27 knees, mean follow-up 9.6 years
- Results
 - Patellar Tendon Length: 56.3mm → 44.3mm
 - Caton-Deschamps Index: 1.22 → 0.95
 - Recurrent Patellar Dislocations: 0
 - Mean subjective IKDC score: 75.6

Results of Distalization without patellar tendon tenodesis

Study	Recurrent Dislocations	Subjective Results
Simmons et al, 1992	0/15	NR
Palmer et al, 2004	2/59	69% Satisfied
Caton and Dejour, 2010	Perfect Stability in 76.8%	
Marteau et al, 2011	0/14	4/14 – apprehension with jumping

Simmons et al, CORR, 1992

Palmer et al, CORR, 2004

Caton and Dejour, Int Orthop, 2010

Marteau et al, 2011

Comparative studies of tibial tubercle distalization with and without patellar tendon tenodesis?

- None
- Recommendation: Consider the addition of patellar tendon tenodesis in cases of patella alta with an **excessively long patellar tendon**
 - Cutoff - **52mm** has been suggested
 - Low risk

Conclusions

- Do not forget to assess patellar height when treating patients with patella alta
- Tibial tubercle distalization is a useful, effective technique for management of patella alta associated with patellar instability

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

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THANK YOU
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