



PATELLA ALTA and TKA

R. GAILLARD

D. WASCHER

S. LUSTIG

E. SERVIEN

Ph. NEYRET

Université Claude Bernard



Hospices Civils de Lyon



The authors of the next presentation have
identified potential conflicts of interest with
Tornier



LYON
GENOU



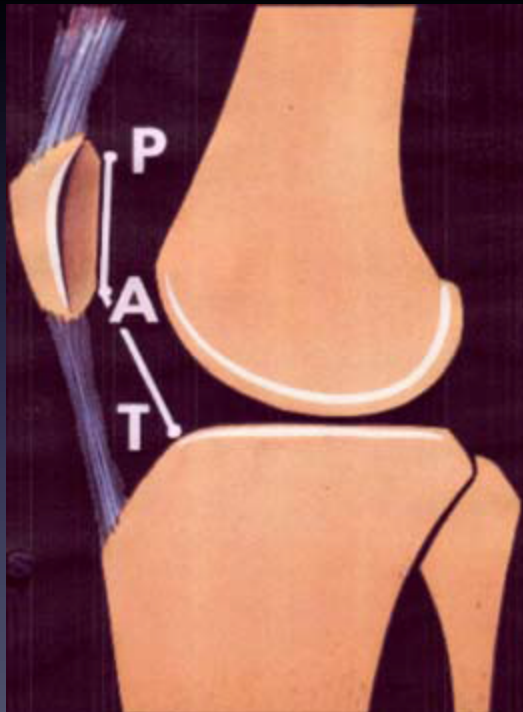
CENTRE
ALBERT
TRILLAT

UNIVERSITY TEACHING CENTER



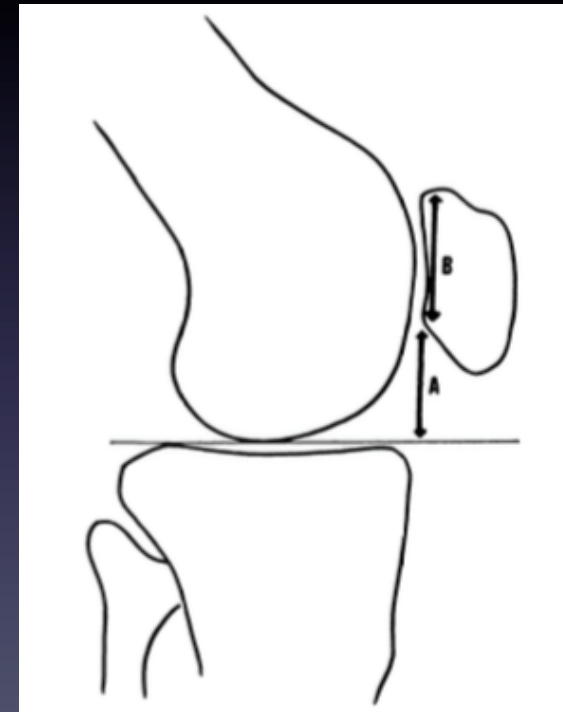
In Lyon, we use :

Caton-Deschamps index



$$AT/AP \geq 1.2$$

Blackburne-Peel index



$$A/B > 1.06$$

Origins of PATELLA ALTA

- Congenital +++ :

- **Femoro-patellar instability**

- *Patella alta in patellofemoral instability, Geenen et al.*

- *Patellar height and patellofemoral congruence, Møller et al.*

- **Acquired ?**

- **Closing wedge HTO +++**

PATELLA ALTA :

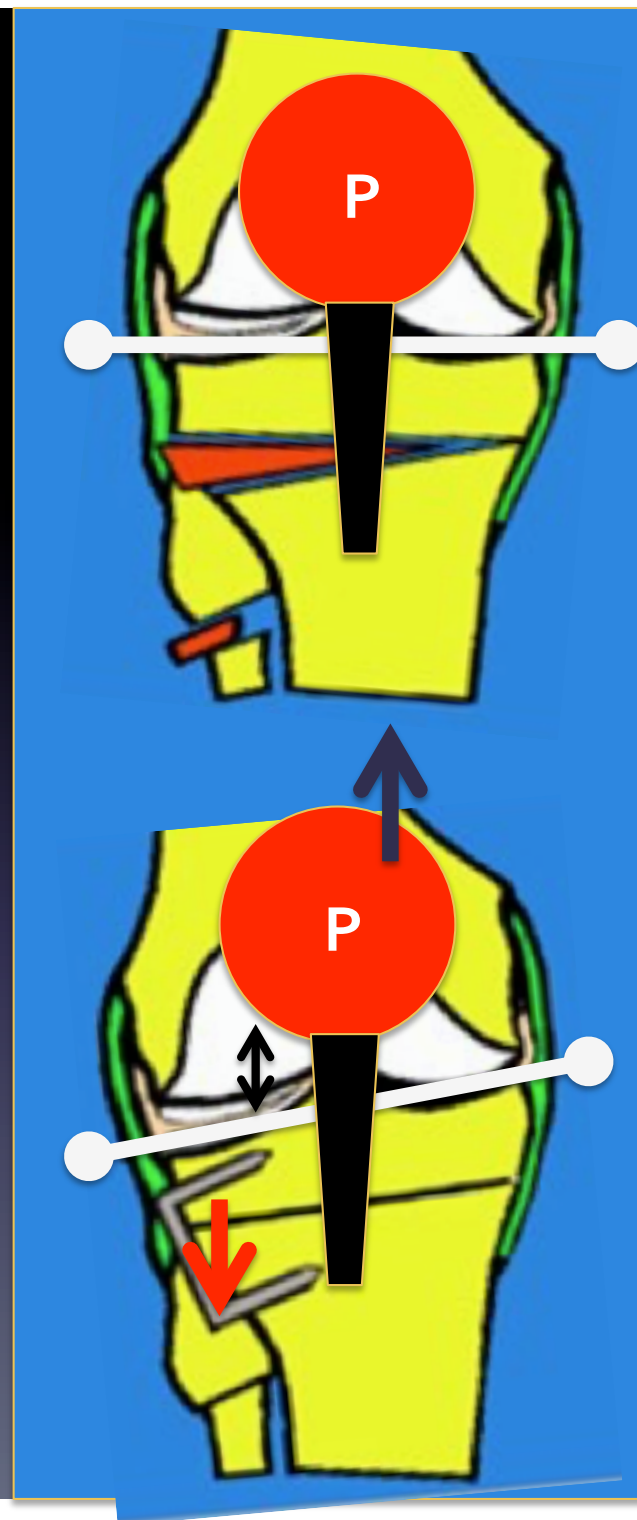
- 34 % of patients with instability
- 7 % of patients without instability

*J. Caton, e-mémoires de l'Académie
Nationale de Chirurgie, 2008*

Closing wedge HTO



- *Patellar height and posterior tibial slope after open- and closed-wedge HTO : a radiological study on 100 patients, El-Azab et al.*
- *Valgus HTO: closing, opening or combined? Patellar height as a determining factor, Portner*
- *Patellar height after HTO, Tigani et al.*



PATELLA ALTA and gonarthrosis

=> PF ARTHROSIS +++



- *Patella alta and gonarthrosis, Ahlbäck et al.*
- *Association between patella alta and the prevalence and worsening of structural features of patellofemoral joint osteoarthritis: the multicenter osteoarthritis study, Stefanik et al.*

PATELLA ALTA and TKA

- *Our experience / our series...*
- Computerized database of **4071 TKA +++**
 - Since 1987
 - Mean follow-up = 3.3 years

Material and methods

- **Retrospective** monocentric study (Centre Albert Trillat, Lyon)

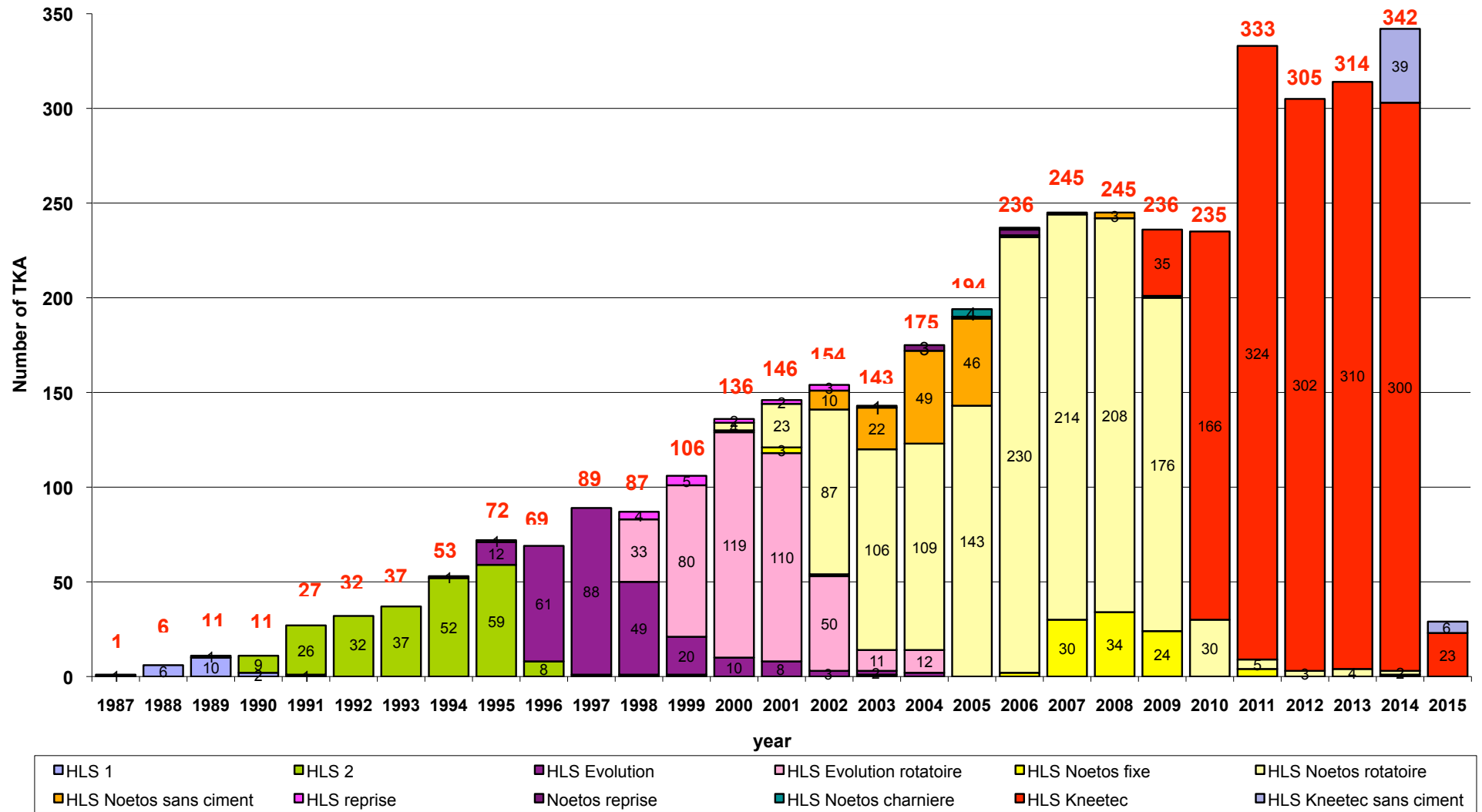


- **4071 implants** since november 1987 to september 2015
- HLS technique / cemented implants
- **Patellar resurfacing +++**



Primary TKA per year

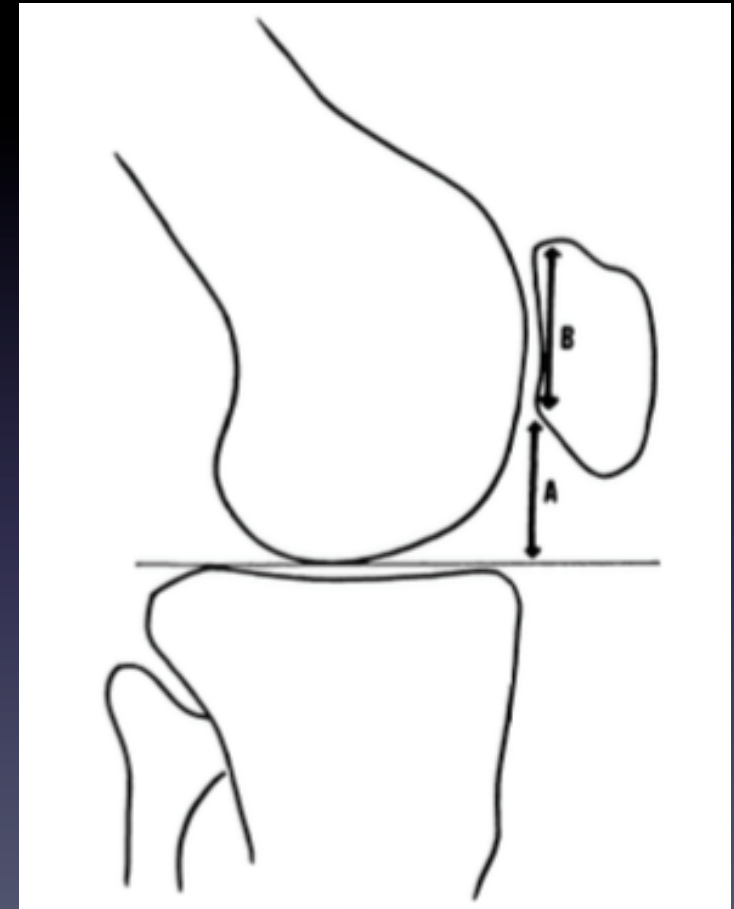
n= 4071



Patellar height measurement

- **Blackburne-Peel**
index +++

- *A new method of measuring patellar height, Blackburne et Peel, 1977*
- *Patellar height ratios. A comparison of four measurement methods, Berg et al.*
- *Reliability and interobserver variability in radiological patellar height ratios, Seil et al.*



$$BP = A/B$$

PATELLA BAJA

$BP < 0.54$



11 %

NORMAL



81 %

PATELLA ALTA

$BP > 1.06$



8 %

440 Patella Baja

4071 TKA

NORMAL PATELLA HEIGHT

Pre-op. BP index = 0.54-1.06

3301 patients

PATELLA ALTA

Pre-op. BP index > 1.06

330 patients

Pre-op. clinical (IKS score) and radiological evaluation
+
Surgical antecedents

Post-op. clinical (IKS score) and radiological evaluation
+
Complications

Control group

« Normal patella height »

Cases group

« Patella Alta »



Groups characteristics

	NORMAL (N=3301)		ALTA (N=330)		p
N	3301		330		
BP index	0.77		1.33		< 0.001
Sex					
Male	(N=2291)	69,4 %	(N=215)	65.2 %	
Female	(N=1010)	30.6 %	(N=115)	34.8 %	
Gonarthosis					
Medial	(N=2270)	76.1 %	(N=194)	66.9 %	
Lateral	(N=529)	17.7 %	(N=76)	26.2 %	
Both	(N=64)	2.1 %	(N=9)	3.1 %	< 0.001
FP	(N=122)	4.1 %	(N=11)	3.8 %	
No data	N=316		N=40		

- Patella Alta : valgus knee +++

Antecedents

	NORMAL (N=3301)	ALTA (N=330)
HTO for valgus (closing wedge)	(N=35) 1.1 %	(N=7) 2.1 %
HTO for varus (closing and opening wedge)	(N=196) 5.9 %	(N=20) 6.1 %
DFO for valgus	(N=11) 0.3 %	(N=2) 0.6 %
ATT transposition	(N=50) 1.5 %	(N=4) 1.2 %
Osteosynthesis	(N=58) 1.8 %	(N=10) 3 %
Arthrolysis	(N=6) 0.2 %	(N=1) 0.3 %

- Patella Alta risk factors :
 - Closing wedge HTO +++ (for valgus or varus)

Closing wedge HTO...

For varus knee



For valgus knee



Pre-op. Clinical Status

	NORMAL (N=3301)	ALTA (N=330)
Mean Flexum.	3.8 °	3.1 °
Max Flexion max.	117.1 °	119.1 °
IKS Knee	51.5	54.5
IKS function	58.5	60.7

- No differences +++

Post-op. Clinical Status

	NORMAL (N=3301)	ALTA (N=330)
Mean follow-up	3.3 years	3 years
Satisfaction		
Satisfied	(N=2067) 92.9 %	(N=204) 91.9 %
Unsatisfied	(N=158) 7.1 %	(N=18) 8.1 %
No data	N=1076	N=108
Mean flexion contracture	0.5 °	0.5 °
Active flexion deficit	4.2 °	3.6 °
Mean max. flexion	118.2 °	118.7 °
IKS score knee	88,3	88.1
IKS score fonction	77.9	80.4

- No differences +++
- Same satisfaction

Post-op. Radiological Status

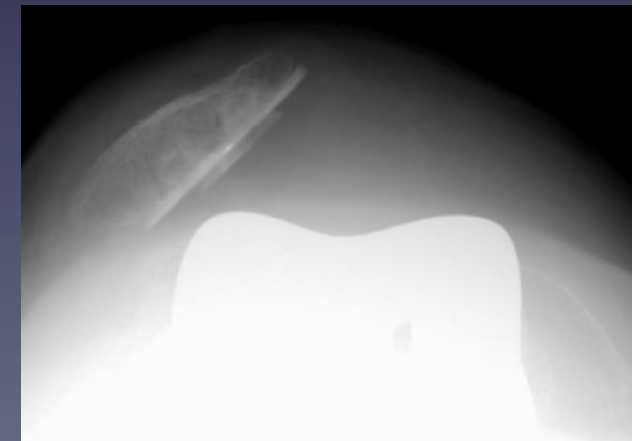
	NORMAL (N=3301)	ALTA (N=330)
HKA	178.9 °	178.8 °
BP index	0.64	0.67
Patellar implant		
<i>High</i>	(N=137) 6.6 %	(N=11) 5.3 %
<i>Centered</i>	(N=1923) 92.9 %	(N=198) 94.7 %
<i>Low</i>	(N=10) 0.5 %	(N=0) 0 %
No data	N=1231	N=121
Patella luxation		
Lateral	(N=127) 6.1 %	(N=16) 7.7 %
Centered	(N=1956) 93.8 %	(N=192) 92.3 %
Medial	(N=3) 0.1 %	(N=0) 0 %
No data	N=1215	N=122

- No differences +++

Complications

	NORMAL (N=3301)	ALTA (N=330)
Stiffness	(n=48) 1.5 %	(n=4) 0.6 %
Laxity	(n=7) 0.2 %	(n=3) 0.9 %
Clunk syndrome	(n=18) 0.6 %	(n=2) 0.6 %
Ext. mechanism rupture	(n=4) 0.1 %	(n=0) 0 %
Patellar implant loosening	(n=2) 0.06 %	(n=0) 0 %
Patella luxation	(n=4) 0.1 %	(n=0) 0 %
Patella subluxation	(n=2) 0.06 %	(n=1) 0.3 %

- Patella Alta :
 - One subluxation so ???
 - Less stiffness +++



Normalization patella height after TKA

PATELLA ALTA GROUP

Before TKA : **BP index = 1.33**



After TKA : **BP index = 0.67**

$p < 0.001$

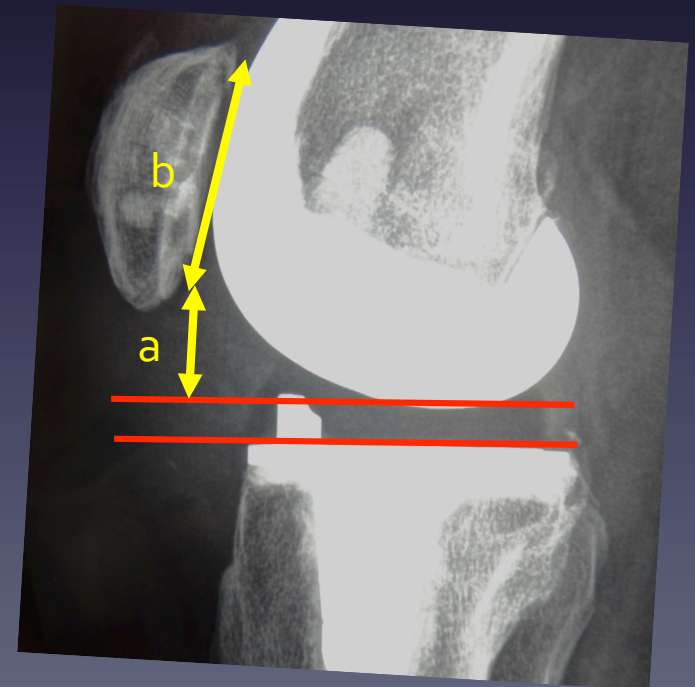
- **TKA decreasing patella height :**

- *Decrease of the length of patellar tendon :*

- *The length of the patellar tendon after unicompartmental and total knee replacement, Weale et al.*

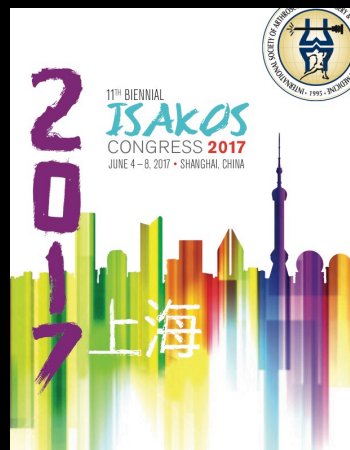
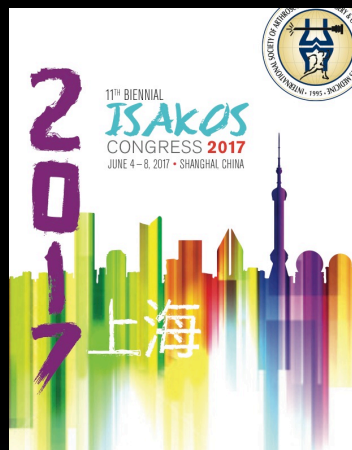
- *Pseudo-Patella Baja :*

- *Pseudo-patella baja after total knee arthroplasty, Kazemi et al.*
- *Bad restauration of the joint space*



CONCLUSION

- Patella alta :
 - **Congenital origin +++** (femoro-patellar instability)
 - No more PF arthrosis
- Patella alta and TKA :
 - **Equal satisfaction +++** and IKS score than TKA with normal patella height
 - **Normalization of patella height +++**
 - Less stiffness



Thank You



ACADÉMIE MÉDICALE DE FOOTBALL DE LYON



