

Optimizing flexion in TKA: Sizing of components

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Flexion in TKA

1. Bony contour
2. Joint line level
3. Ligament balancing
4. Ligament tensioning
5. Patellar height
6. Patellar thickness

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- Design
- Quality of bone cuts
- Reliability of instrumentation
- Sizing

Undersizing

Knee flexion increases with posterior offset

Bellemans, JBJS Br 2002

Under-sizing in TKAs'

Under-sizing in TKAs'

Oversizing: pain & stiffness

Mahoney JBJS 2010. Overhang >3mm

Method of the study

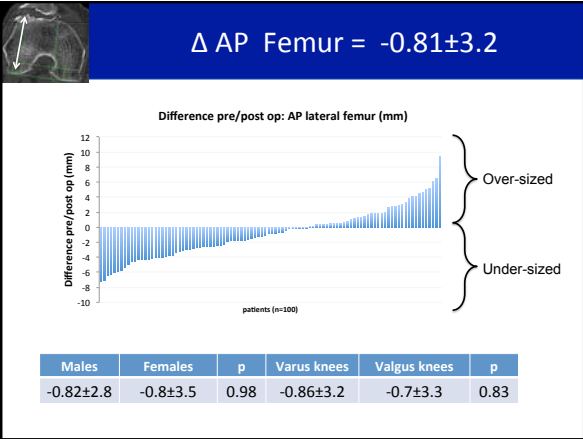
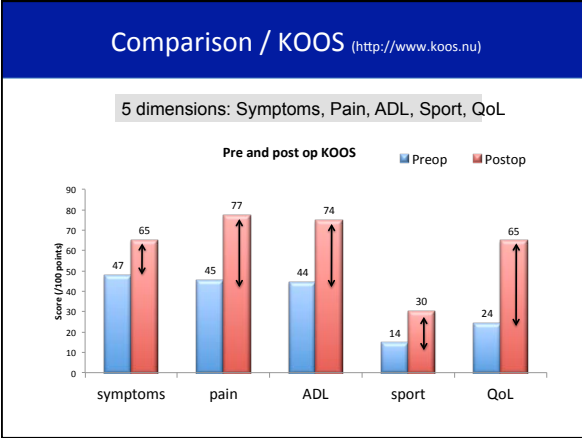
- ✓ 100 TKA: January-June 2008 (MB)
- ✓ Exclusion: previous surgery, stage IV,
- ✓ Single implant: Noetos Fixed bearing Tornier SA
- ✓ Preop CT-scan
- ✓ KOOS: preop and at 1 year post op

M Bonnin and Al. AAOS 2011

ML & AP dimensions (Femur and Tibia)

Dimensions on preop CT-scan / implanted component

Measurement with OsiriX software: <http://www.osirix-viewer.com/Downloads.html>



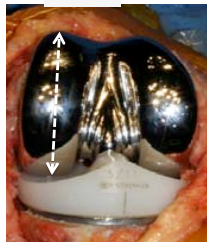
Improvement of KOOS (Diff post op – preop)

	Under-sized (<1mm)	Over-sized (>1mm)	P-value
GLOBAL	34.2±15	22.8±14	0.002

Improvement of KOOS (Diff post op – preop)


	Under-sized (<1mm)	Over-sized (>1mm)	P-value
GLOBAL	34.2±15	22.8±14	0.002
Symptoms	19.9	13.9	0.01
PAIN	35.8±20	23.9±16	0.01
ADL	36.6	20.4	0.001
QoL	44.5	33.0	0.038

Δ Pain score: Threshold= +1mm



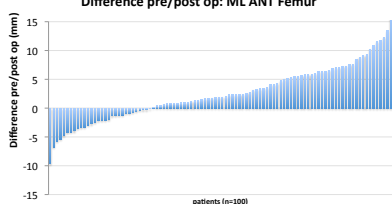
Variation pre/post op	
Δ dimension	Δ Pain score
> 1mm	23.9±16
<1mm	35.1±20

P-value	
Bilateral T test	0.010
Unilateral T test	0.005
Wilcoxon bilateral	0.022
Wilcoxon unilateral	0.011



Δ ML ANT Femur = +2.5±4.7mm

Difference pre/post op: ML ANT Femur



Males	Females	p	Varus knees	Valgus knees	p
1.6±5.3	3.02±4.2	0.14	2.26±4.7	3.0±4.7	0.46

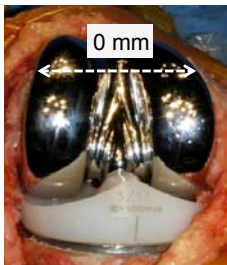
Improvement of KOOS (Diff post op - preop)

	Under-sized (<1mm)	Over-sized (>1mm)	P-value
GLOBAL score	37.3±19	29±15	0.04

Improvement of KOOS (Diff post op - preop)

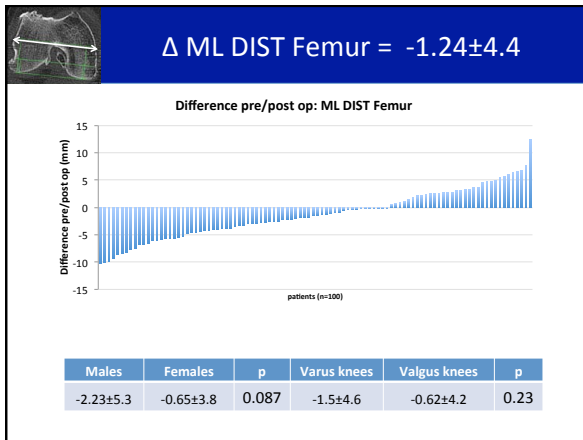
	Under-sized (<1mm)	Over-sized (>1mm)	P-value
GLOBAL score	37.3±19	29±15	0.04
Symptoms	24.5	17.7	0.1
PAIN	38.7±21	30.3±18	0.03
ADL	37.5	28.3	0.05
QoL	48.5	41.3	0.1

Δ Pain score: Threshold= 0 mm



Variation pre/post op	
Δ dimension	Δ Pain score
> 0mm	29.7±18
<0mm	39.2±20

P-value	
Bilateral T test	0.08
Unilateral T test	0.04
Wilcoxon bilateral	0.063
Wilcoxon unilateral	0.031

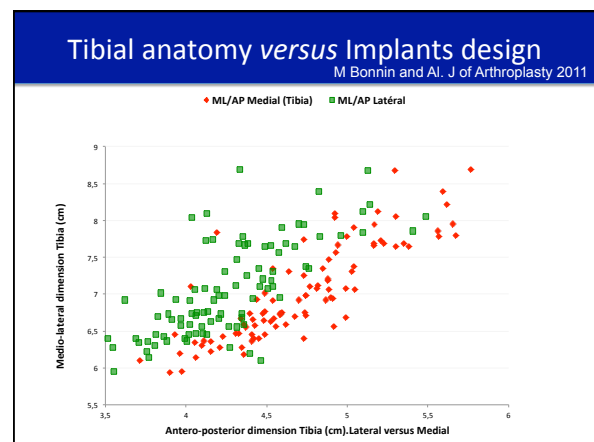
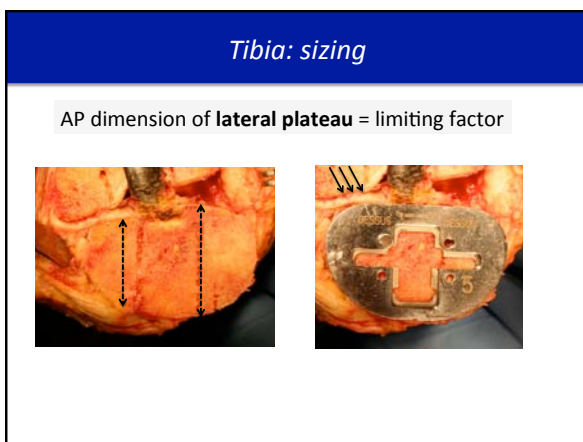
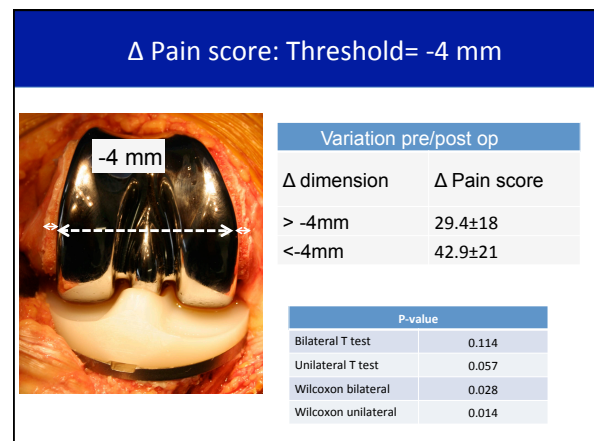


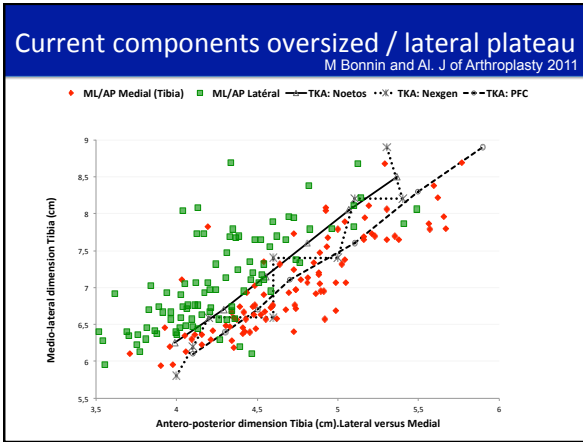
Improvement of KOOS (Diff post op - preop)

	Under-sized (<1mm)	Over-sized (>1mm)	P-value
GLOBAL	32.7±16	26.6±16	0.031

Improvement of KOOS (Diff post op - preop)

	Under-sized (<1mm)	Over-sized (>1mm)	P-value
GLOBAL	32.7±16	26.6±16	0.031
Symptoms	19.6	15.4	0.2
PAIN	33.7±20	29±19	0.18
ADL	32.7	28.0	0.15
QoL	44.6	33.7	0.04





Δ Pain score: Threshold = +4mm

Variation pre/post op	
Δ dimension	Δ Pain score
> 4mm	27.4±18
<4mm	35.2±19

P-value	
Bilateral T test	0.070
Unilateral T test	0.035
Wilcoxon bilateral	0.043
Wilcoxon unilateral	0.023

Δ Pain score: Threshold = +2.5 mm

Variation pre/post op	
Δ dimension	Δ Pain score
> 2.5mm	26.7±19.9
< 2.5mm	34.8±18

P-value	
Bilateral T test	0.089
Unilateral T test	0.044
Wilcoxon bilateral	0.086
Wilcoxon unilateral	0.043

Conclusion

- 1- Primary TKA: careful bony adaptation
- 2- painful or stiff TKA: think oversizing

- Comparative CT-scan
- Analyse the CT by yourself

