

TKR after tibial tuberosity surgery, PF arthritis lateral subluxation of the patella

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Potential difficulties before TKR

- Axis
- Slope
- Stiffness
- Patella baja
- Ligaments...
- Bone
- Skin
- **Previous surgery**



- Problem for Surgical exposure?
- Eversion/lateralisation of the patella
- Positionning of the implants

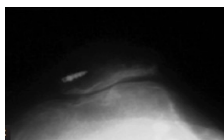
PREOP PLANNING

SURGICAL TECHNIQUES
Step by step procedure



PREOP PLANNING

- Main problems after ATT osteotomy:
- Patellar tracking TTTG angle
- Tibial rotation
- Patellar height



SURGICAL EXPOSURE

- Risk for patella avulsion during TKR= 0.5%
- Reconstruction
- Poor results
- Flexion
- Extensor lag

The Journal of Arthroplasty Vol. 17 No. 1 2002

Patella Inversion Method for Exposure in Revision Total Knee Arthroplasty

Thomas K. Fehring, MD, Susan Odum, MD, MA, William L. Griffin, MD, J. Bohannon Mason, MD

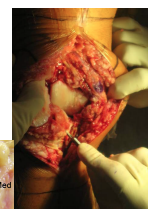
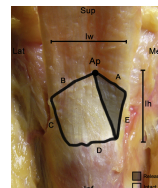
Surgical approach

- Different options
- Lateral approach
- Medial with patellar tendon release
- ATT osteotomy



Medial approach PT release

- Effect of medial release of the PT
- Dervin J Arthroplasty 2014 Epub
- Increase 30% exposure of the lateral side
- Loss of 20% ultimate strength
- Risk OK
- Reasonable limit



Medial approach quad release

- Tarabichi S J Arthroplasty 2010
- Complete resection of the suprapatellar adhesions
- Gain of motion

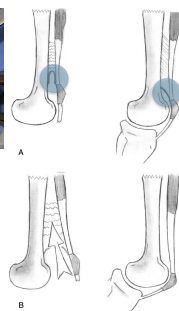
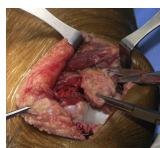
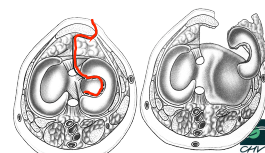
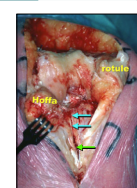
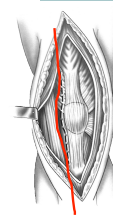


Table 1. Shown are the measured prerelease ROM (under anesthesia) and the average immediate postrelease improvement

Prerelease ROM (range) (°)	85 (n=2)	90 (n=2)	95 (n=9)	100 (n=4)	105 (n=14)	≥110 (n=11)
Post-release improvement (average, in degrees)	55	40	38	39	32.5	26

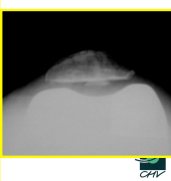
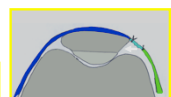
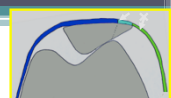
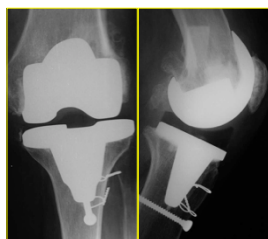
Lateral approach

- Koblisch 1991
- Lateral patellar tendon release
- Limited
- With or without ATT osteotomy



Lateral approach

- Better placement of the femoral and patellar component (rotation)



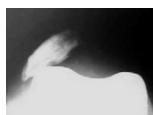
ATT (RE-)osteotomy

- Clinical case: ATT osteotomy for patellar instability
- Epiphysiodesis
- Inverted tibial slope
- Patella baja
- No patellar tilt
- TKR, ATT



Internal Tibial Rotation

- Patellar Maltracking



-16mm

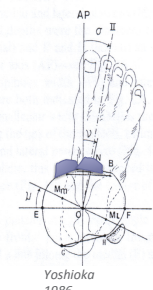
- Problem: definition of the right axis of the tibia
- Definition when the TTGT angle has been modified



Tibia Landmarks ?

- Do not directly correspond to the flexion axis
- Large variability of the morphology

Incavo: CORR 1994, Westrich: JoA 1995 Cheng: Clin Biomec. 1999 Uehara: CORR 2002 Uehara: JoA 2002 Kwak: The Knee 2007, Bonnin: J Arthroplasty 2011



Yoshioka
1986

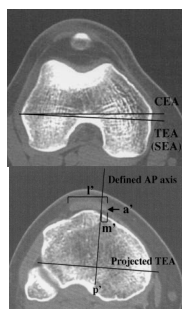


Femur Landmark : projection of the trans epicondylar axis

Logical

- Approximation of the knee flexion axis (*Agaki CORR 2004-2005, Uehara CORR 2003, Matsui 2005, Aglietti CORR 2008*)

But : how to achieve ? Is there a relationship between TEA and intra operative tibia landmark?



Femur Landmark : Self Adjustment Technique

Background

- If the femoral component is well rotated
- Self adjustment technique should spontaneously position the tibial component parallel to the femoral component and then the trans epicondylar axis
- It is a dependent technique

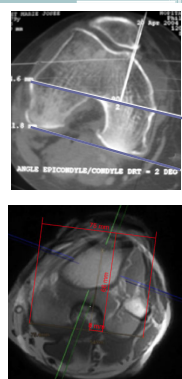
Bindelglass Orthop 2001, Lee Int Orthop 2008



Femur Landmark : Self Adjustment Technique

- 1st step : rotation of the femoral component :
 - Pre op Ctscan or MRI, assess TTGT distance
 - Rotation adapted to the Posterior condylar angle (*Galaud RCO 2008, Michaut RCO 2008*)

- 2nd step : self adjustment
 - Several movements of flexion-extension allow a spontaneous positioning of the tibial tray. (*Lee Int Orthop 2008*)



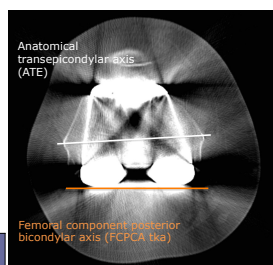
Femur Landmark : Self Adjustment Technique

- Does it work ?
 - 50 TKA varus deformity / medial parapatellar approach: 7.8° (1;17.5)
 - 44 TKA valgus deformity/ lateral parapatellar approach: 8.7° (2;7)
 - 7 cases with ATT surgery
 - NexGen LPS Flex with symmetrical component tibial (Zimmer)
 - Navigation system Navitrack (Zimmer) for femoral component rotation : goal: PCA -3°/+ 2°

Berhouet, Beaufils, Pujol OTSR 2010



1 Femoral Positioning

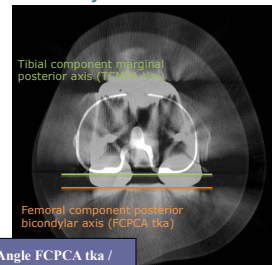


Goal : $-3^{\circ} \pm 2^{\circ}$

	PCA tka
Varus knees	$-3.1^{\circ} (+/- 1.9)$
Valgus knees	$-4.7^{\circ} (+/- 2.9)$



2 Self Adjustment measurement



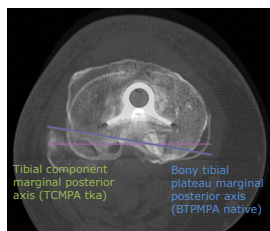
Goal : $0^{\circ} \pm 2^{\circ}$

Superposing femoral and tibial slides Dicom Toolbox v1.2

	Angle FCPCA tka / TCMPA tka
Varus knees	$0.75^{\circ} (+/- 4.4)$
Valgus knees	$0.9^{\circ} (+/- 4.5)$



3 Tibial implant vs Bony Tibia

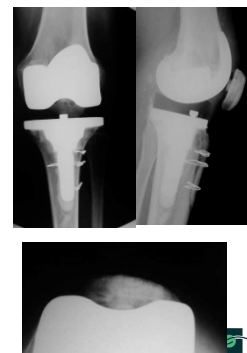


Varus knees	$6.1^{\circ} (+/- 5.8)$
Valgus knees	$12.5^{\circ} (+/- 8.6)$



1/ Self adjustment allows parallel alignment between femoral component and tibial component

2/ Self adjustment allows a proper alignment of the tibial component, regarding the transepicondylar axis providing a reliable femoral reference with pre operative evaluation of individual femoral rotation for each knee (pre-operative CT-scan)



Conclusion:

- TKR after ATTT
- Assess patellar height
- Exposure
- Manage potential patellar instability
- Avoid tibia malrotation (internal)
- ATT reosteotomy

