



AMP

PROPHECY

PROPHECY™: THE TOULOUSE EXPERIENCE

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A 3D medical illustration of a human knee joint, rendered in a translucent blue color. The femur and tibia are visible, along with a total knee replacement prosthesis. The joint is shown in a flexed position. The background is a light blue gradient with faint grid lines and a large, semi-transparent "AMP" watermark.

Envision the Results.™

PROPHECY™ Pre-Operative Navigation Guides

PROPHECY™ pre-operative navigation is a state-of-the-art technology utilizing pre-operative CT or MRI scans to create custom total knee alignment guides through high-resolution rapid prototyping.

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THE TOULOUSE EXPERIENCE

➤ PRELIMINARY RESULTS

- **SEPT 2010- FEB 2011**
- **PER OP RESULTS**
 - **Cut thickness**
 - **Size concordance**
- **ALIGNMENT**

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THE TOULOUSE EXPERIENCE

- **PATIENTS: 27**

- **INDICATIONS**

- **AGE**

- **DEFORMITY**

- **THA**

idem **COMPUTER ASSISTED SURGERY**

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THE TOULOUSE EXPERIENCE

- PLANIFICATION
– WEBSITE

PROPHETRY™ Pre-Operative Navigation – Teamce... Home Refresh Print

State:

Zip:

Sales Person:

Alignment Preferences:

Insert Type:	<input type="text" value="Medial-Pivot"/>	Cement Use:	<input type="text" value="Press Fit"/>
Femur - Varus - Valgus/Flexion:	<input type="text" value="Mechanical Axis - 0 degree"/>	Tibia - Varus - Valgus/Flexion:	<input type="text" value="Mechanical Axis - 0 degree"/>
Femur - Rotation:	<input type="text" value="3 degree external to posterior condyles
Epicondyles (lateral peak to medial sulcus)"/>	Tibia - Rotation:	<input type="text" value="Medial tubercle"/>
Femur - Distal Medial Resection:	<input type="text" value="9 mm"/>	Tibia - Slope:	<input type="text" value="3 degree"/>
Femur - AP Position:	<input type="text" value="11 mm"/>	Tibia Resection:	<input type="text" value="10 mm from highest side"/>
Align and Cut Femoral Guide:	<input type="text" value="9 mm"/>	Align and Cut Tibial Guide:	<input type="text" value="10 mm from lateral side"/>
	<input type="text" value="Yes"/>		<input type="text" value="2 mm from lowest side"/>
			<input type="text" value="2 mm from medial side"/>

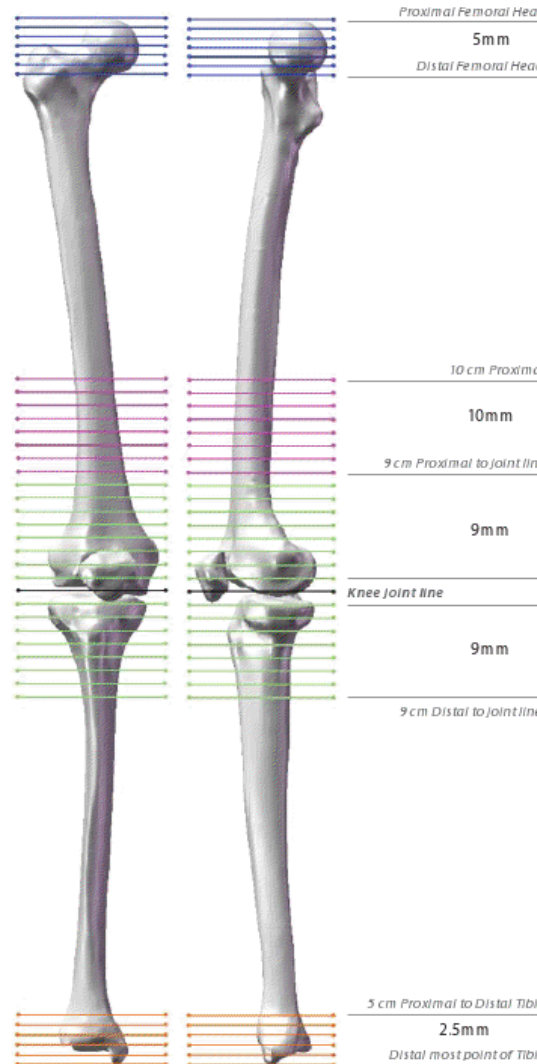
Username/Password:

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THE TOULOUSE EXPERIENCE

NOTE: All scan locations (hip, femur, knee and ankle) are necessary.

- **PLANIFICATION**
– **CT SCAN**



SCAN LOCATIONS: HIP

- o Anatomic landmarks: Femoral head
- o Slice increment: 5 mm
- o Scan boundaries: 6 slices from proximal to distal femoral head

SCAN LOCATIONS: FEMUR

- o Anatomic landmarks: none
- o Slice increment: 10 mm
- o Scan boundaries:
 - Start at the border of the knee scan (9 cm proximal to joint line)
 - End 10 cm proximal of start location

SCAN LOCATIONS: KNEE

- o Anatomic landmarks: Patella and tibial tubercle
- o Slice increment: 1.25 mm
- o Scan boundaries: 9 cm proximal and 9 cm distal of joint line

SCAN LOCATIONS: ANKLE

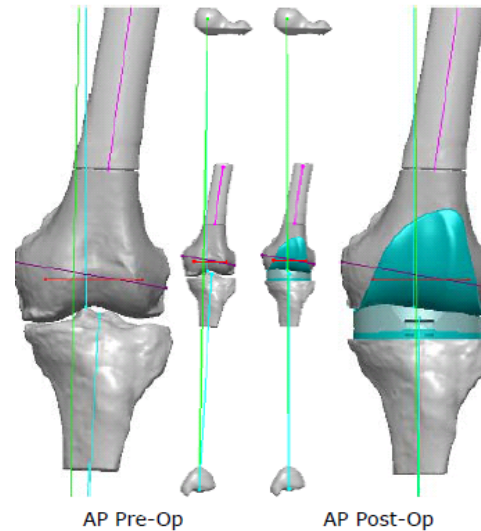
- o Anatomic landmarks: Distal tibia
- o Slice increment: 2.5 mm
- o Scan boundaries:
 - Start 5 cm above distal tibia
 - End at distal most tibial point

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THE TOULOUSE EXPERIENCE

- **PLANIFICATION**
— **REPORT**

Size 5 Left ADVANCE® Standard, Size 5 Base
10mm Medial-Pivot Insert



Varus-Valgus Angle
(measured from the femoral
anatomic axis)

Pre-op: 4.9° valgus

Post-op: 8.1° valgus

Mech. axis to Anatomic axis
angle (in coronal plane): 8.1°

Hip-Ankle Line

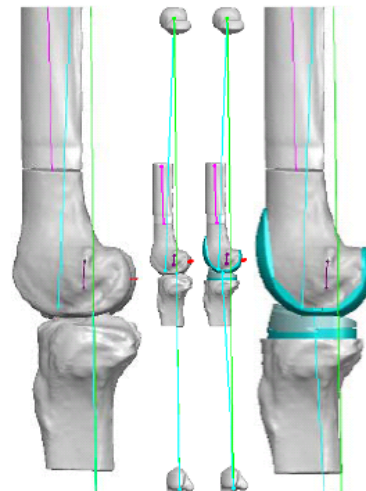
Pre-op: 833.0 mm

Post-op: 834.9 mm

—	Fem. Anat. Axis
—	Fem. Mech. Axis
—	TEA
—	Hip/Ankle Line

AP Pre-Op

AP Post-Op



Sagittal Mech Axis Angle
(femoral anatomic axis to
tibial anatomic axis)

Pre-op: 0.7° extension

Post-op: 1.4° flexion

Distal Cuts

Medial: 9.0 mm

Lateral: 6.6 mm

Posterior Cuts

Medial: 11.3 mm

Lateral: 8.2 mm

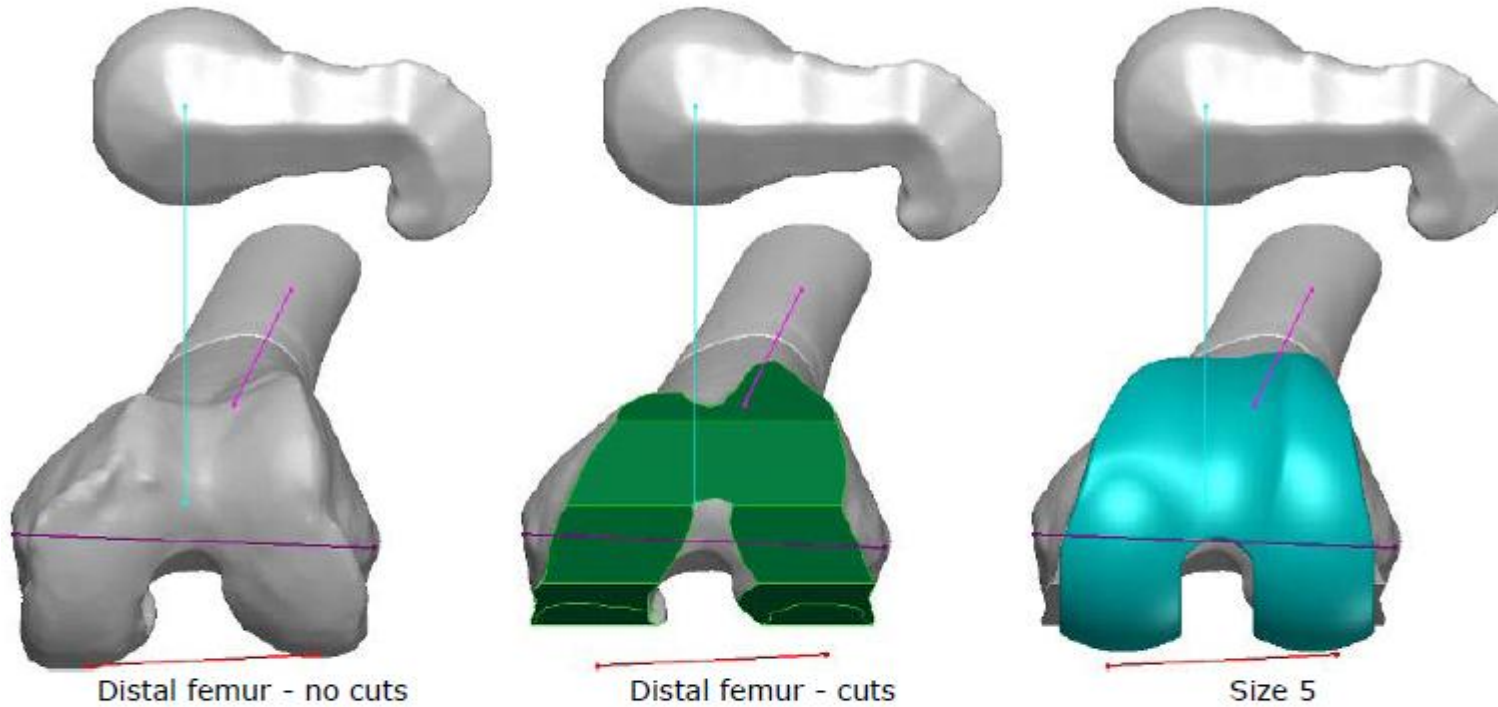
Mech. axis to Anatomic axis
angle (in sagittal plane): 3.6°

—	Fem. Anat. Axis
—	Fem. Mech. Axis
—	TEA
—	Hip/Ankle Line

Lat. Pre-Op

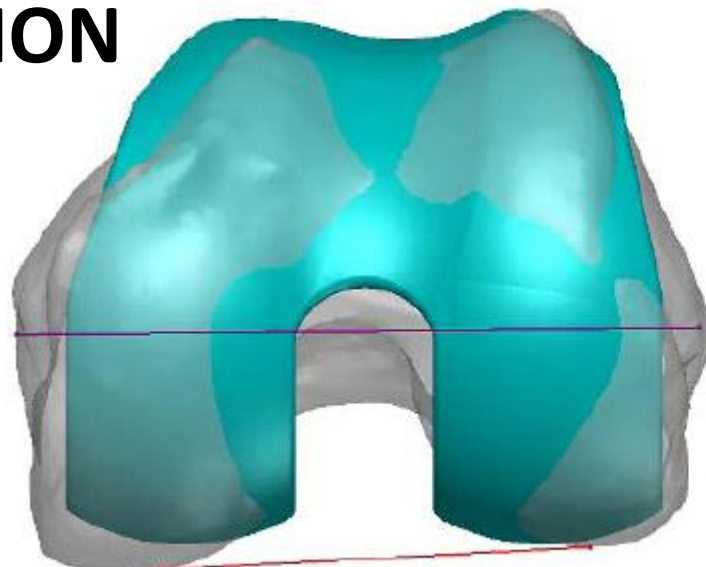
Lat. Post-Op

Size 5L Standard



• PLANIFICATION

– REPORT



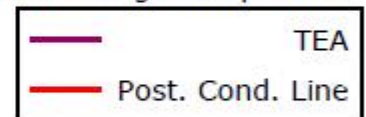
Medial

Lateral

TEA is 2.5° external from the posterior condyles

No stuffing of the patella

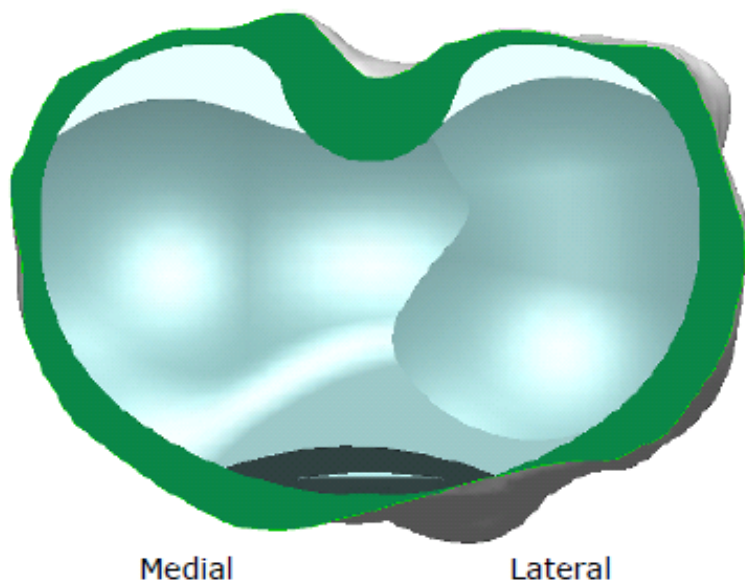
Similar trochlear groove profiles



• PLANIFICATION

– REPORT

Size 5, Medial-Pivot



- Tibial Cut 3.0° posterior slope
- Resection side:
7 mm from highest side
- Insert AP orientation:
Medial tubercle
- Medial resection: 3.1 mm
- Lateral resection: 7.0 mm

Femoral Alignment Method

- Distal cut is referenced to Mechanical Axis - 0 degree
- Femoral rotation set by the 3 degree external to posterior condyles
- Distal resection level set to 9 mm
- AP component position set by Anterior flange placed to prevent notch/overhang
- Femoral component flexed 2° from the mechanical axis in order to obtain optimal posterior resections
- Size 5 ADVANCE® Femur

• PLANIFICATION

– REPORT

Tibial Alignment Method

- Proximal cut 3° posterior slope to anatomic axis
- Component rotation set by Medial tubercle
- Resection level from 7 mm from highest side
- ADVANCE® Tibia Base Size 5
- Size 5 Left 10 Medial Pivot Insert

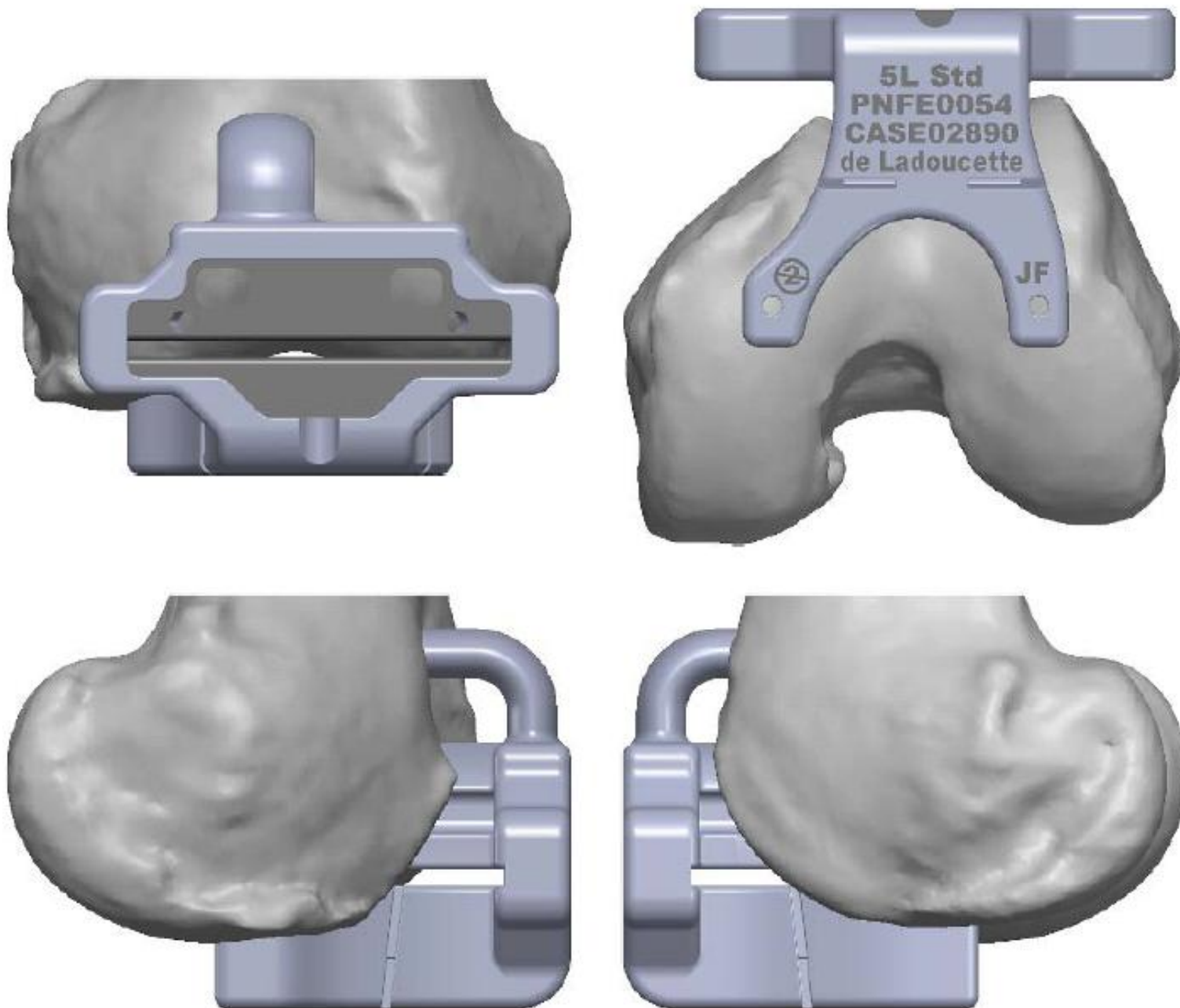
Prophecy™ Engineer Comments

The tibial resection was set to 7 mm from the highest side to provide a complete resection while sparing bone stock and maintaining the pre-operative to post-operative limb length.

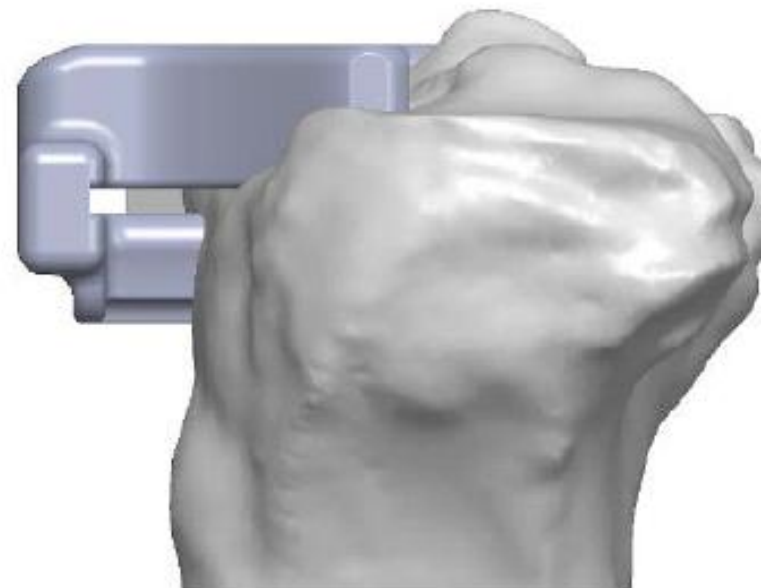
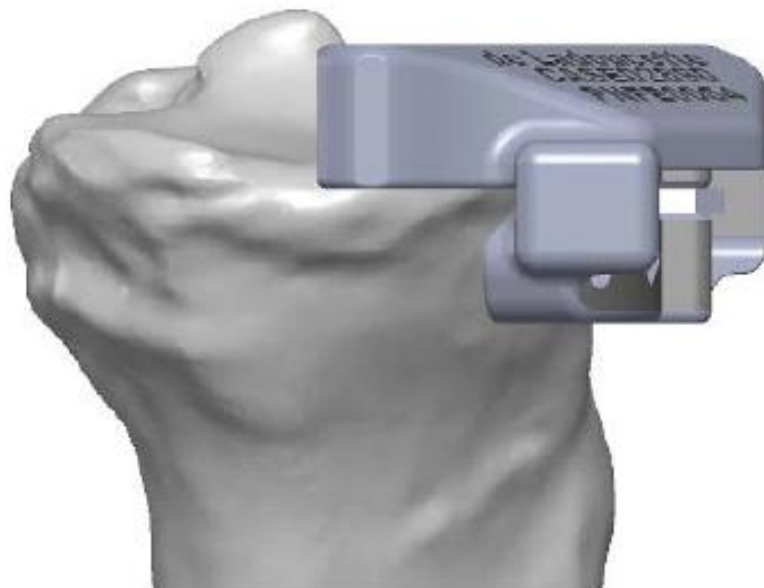
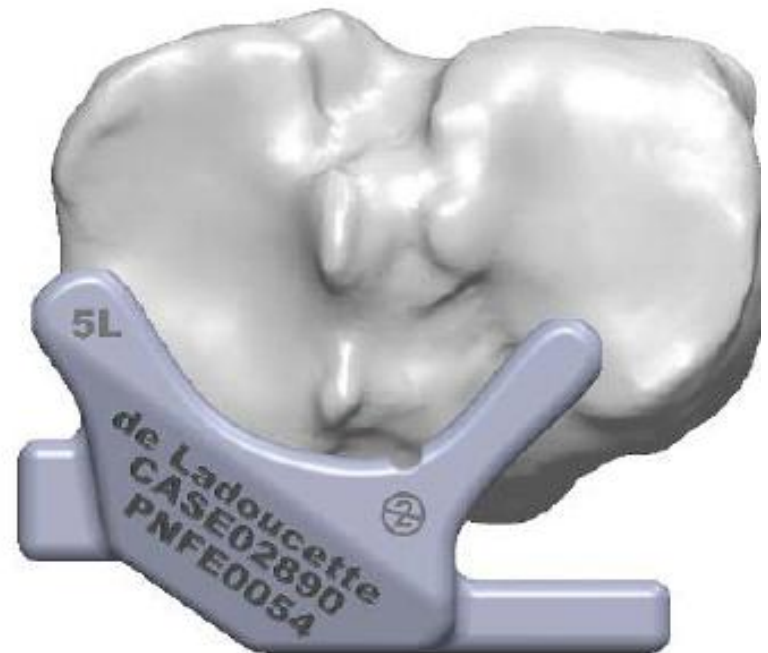
Recommended Implants

- Femoral component: KFTCPC5L
- Tibial base: KTSCFM50
- Insert: KIMP510L
- Part Number: PNFE0054
- Order Kit: K100KT80 and K100KT5L
- Order kit K100KT65 for press-fit tibial implants

Femoral Guide Placement

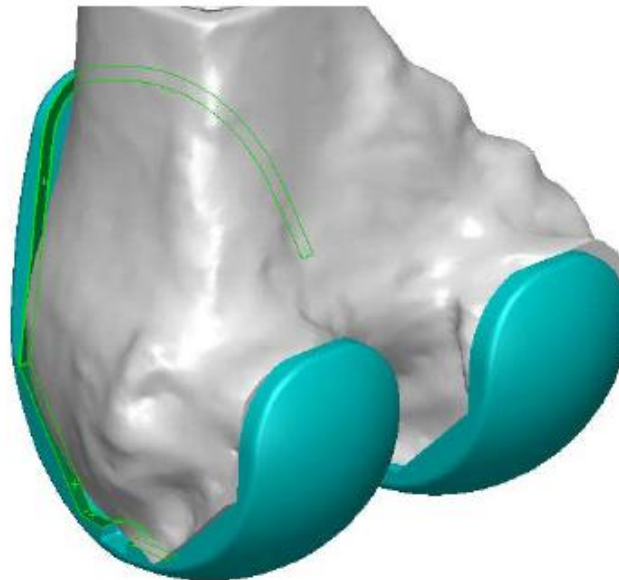
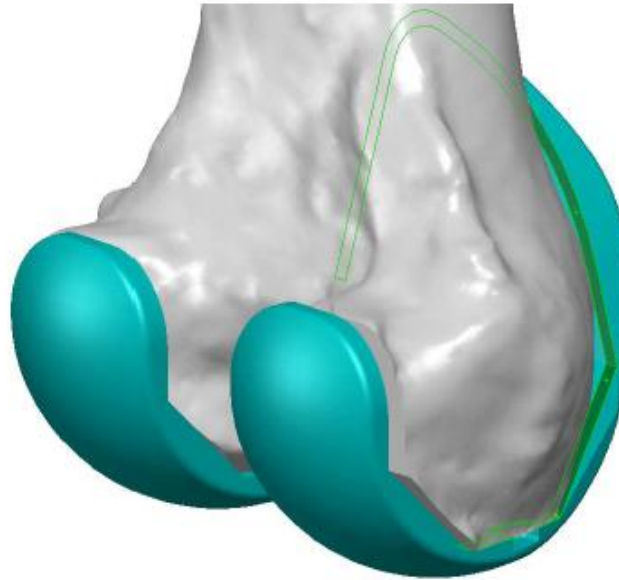


Tibial Guide Placement



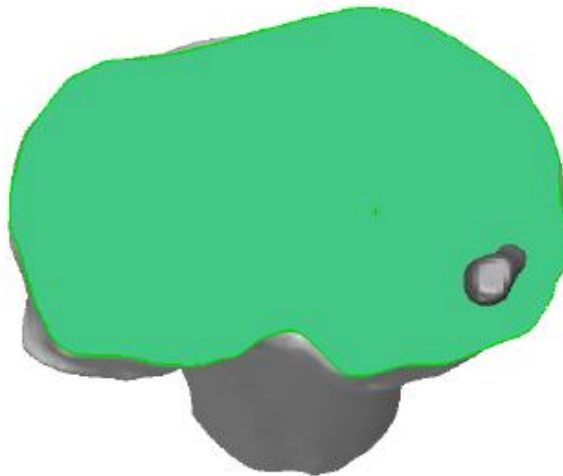
Femoral implant

Size 5 Standard implant with 2° of flexion from the mechanical axis presents overhang at the lateral and medial sections, as shown below.



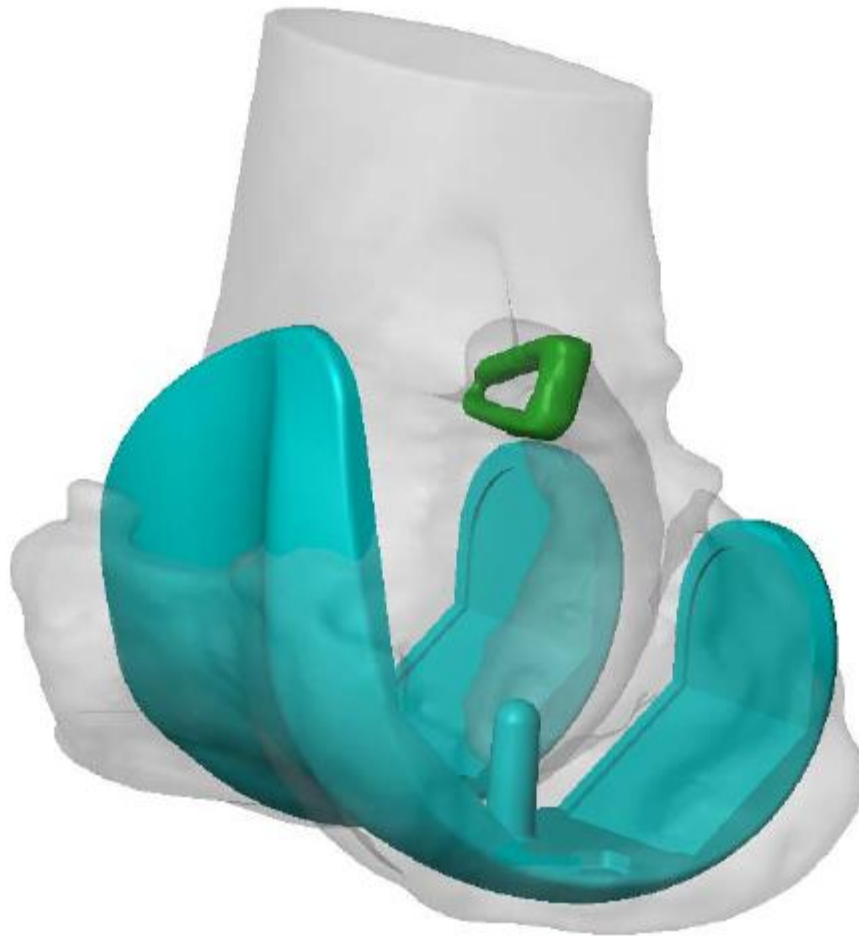
Cavity at the Tibia

The tibia presents a cavity in the posterior medial side. The cavity interferes with the tibia resec



Hardware at Femur

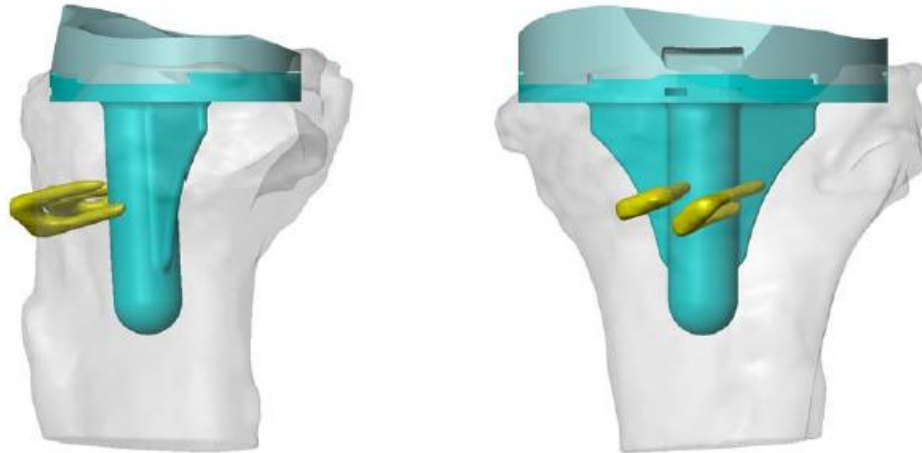
The patient has metal hardware. The hardware is not interfering with the femoral implant.



Oblique view of femoral implant and metal hardware

Hardware at Tibia

The patient has metal hardware that interferes with the tibia implant.



Sagittal and Coronal views of hardware interfering with tibia implant



Oblique view of tibia implant and metal hardware

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- **PRE OP DEFORMITY**
 - **24 Varus (prophecy planification)/ 27**
 - **16 Varus (X- ray)/ 19**

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- **ALIGNMENT**

- **PROPHECY PLANIFICATION:**

- Valgus $1,6 \pm 4^\circ$ (anatomical axis)**

- Varus $4 \pm 4^\circ$ (mechanical axis)**

- **X- RAY GONIOMETRY:**

- Varus $5 \pm 6^\circ$ (mechanical axis)**

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- **SIZE CONCORDANCE**
 - **FEMUR:**
 - 2 upsized (standard vs stature) / 24
 - **TIBIA**
 - 2 downsized (standard vs plus) / 24
 - 1 upsized (plus vs standard) /24

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- **DIFFERENCE= PLANNED – DONE**
 - **DISTAL FEMUR**
 - **MEDIAL : 1,1 ± 1,3 (≠)**
 - **LATERAL : 0,3 ± 1,3 (=)**

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DISTAL CONDYLES

	PLANNED	DONE	
MEDIAL	9 ± 0,5	8 ± 1	<i>S</i>
LATERAL	7 ± 1	6 ± 2	<i>NS</i>

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THE TOULOUSE EXPERIENCE

- **DIFFERENCE= PLANNED – DONE**
 - **POSTERIOR FEMUR**
 - **MEDIAL : $1,2 \pm 2$ (\neq)**
 - **LATERAL : $1,9 \pm 2$ ($=$)**

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THE TOULOUSE EXPERIENCE

POSTERIOR CONDYLES

	PLANNED	DONE	
MEDIAL	11 ± 1	10 ± 2	<i>S</i>
LATERAL	9 ± 1	8 ± 2	<i>NS</i>

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THE TOULOUSE EXPERIENCE

- **DIFFERENCE= PLANNED – DONE**

–TIBIA

- **MEDIAL : - 1 ± 2 (=)**
- **LATERAL : - 2 ± 1 (≠)**

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TIBIAL PLATEAU

	PLANNED	DONE	
MEDIAL	4 ± 1	4 ± 2	NS
LATERAL	7 ± 1	9 ± 2	S

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DIFFERENCE	< -2	-2 < < 2	> 2
MED DIST COND	0	13	3
LAT DIST COND	0	16	1
MED POST COND	1	13	4
LAT POST COND	0	11	6
MED TIB PLAT	1	13	2
LAT TIB PLAT	7	8	1

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- **POLYETHYLENE**

- **4 PE increased 2 mm**

- Lateral Tib Plat - 4 mm

- Medial Post Cond 3 mm

- Medial Dist Cond 4 mm, Medial Tib Plat – 5 mm

- Medial Post Cond 5 mm , Tib Plat – 4 mm (+ 2)

- **1 PE increased 4 mm**

- Lateral Tib Plat – 3 mm, Medial Tibial Plat -2,5 mm

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- **CONCLUSION 1**
CT- SCAN > X- RAY

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- **CONCLUSION 1 CT- SCAN > X- RAY**

- **CONCLUSION 2**
COMPONENT SIZES APPROPRIATE

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THE TOULOUSE EXPERIENCE

- **CONCLUSION 1: CT- SCAN > X- RAY**
- **CONCLUSION 2: COMPONENT SIZES APPROPRIATE**

- **CONCLUSION 3**
CUT DONE ± CUT PLANNED

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THE TOULOUSE EXPERIENCE

- **CONCLUSION 1: CT- SCAN > X- RAY**
- **CONCLUSION 2: COMPONENT SIZES APPROPRIATE**
- **CONCLUSION 3: CUT DONE ± CUT PLANNED**

- **CONCLUSION 4**
NO CORRELATION PE THICKNESS/ CUT

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THE TOULOUSE EXPERIENCE

- CONCLUSION 1: CT- SCAN > X- RAY
- CONCLUSION 2: COMPONENT SIZES APPROPRIATE
- CONCLUSION 3: CUT DONE ± CUT PLANNED
- CONCLUSION 4: NO CORRELATION PE THICKNESS/ CUT

- CONCLUSION 5
CARTILAGE THICKNESS

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THE TOULOUSE EXPERIENCE

- CONCLUSION 1: CT- SCAN > X- RAY
- CONCLUSION 2: COMPONENT SIZES APPROPRIATE
- CONCLUSION 3: CUT DONE ± CUT PLANNED
- CONCLUSION 4: NO CORRELATION PE THICKNESS
- CONCLUSION 5: CARTILAGE THICKNESS

—CONCLUSION 6
LAXITY



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THE TOULOUSE EXPERIENCE

- **CONCLUSION 1: CT- SCAN > X- RAY**
- **CONCLUSION 2: COMPONENT SIZES APPROPRIATE**
- **CONCLUSION 3: CUT DONE ± CUT PLANNED**
- **CONCLUSION 4: NO CORRELATION PE THICKNESS/ CUT**
- **CONCLUSION 5: CARTILAGE THICKNESS**
- **CONCLUSION 6: LAXITY**

- **CONCLUSION 7**

STUDIES COMPLETED

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