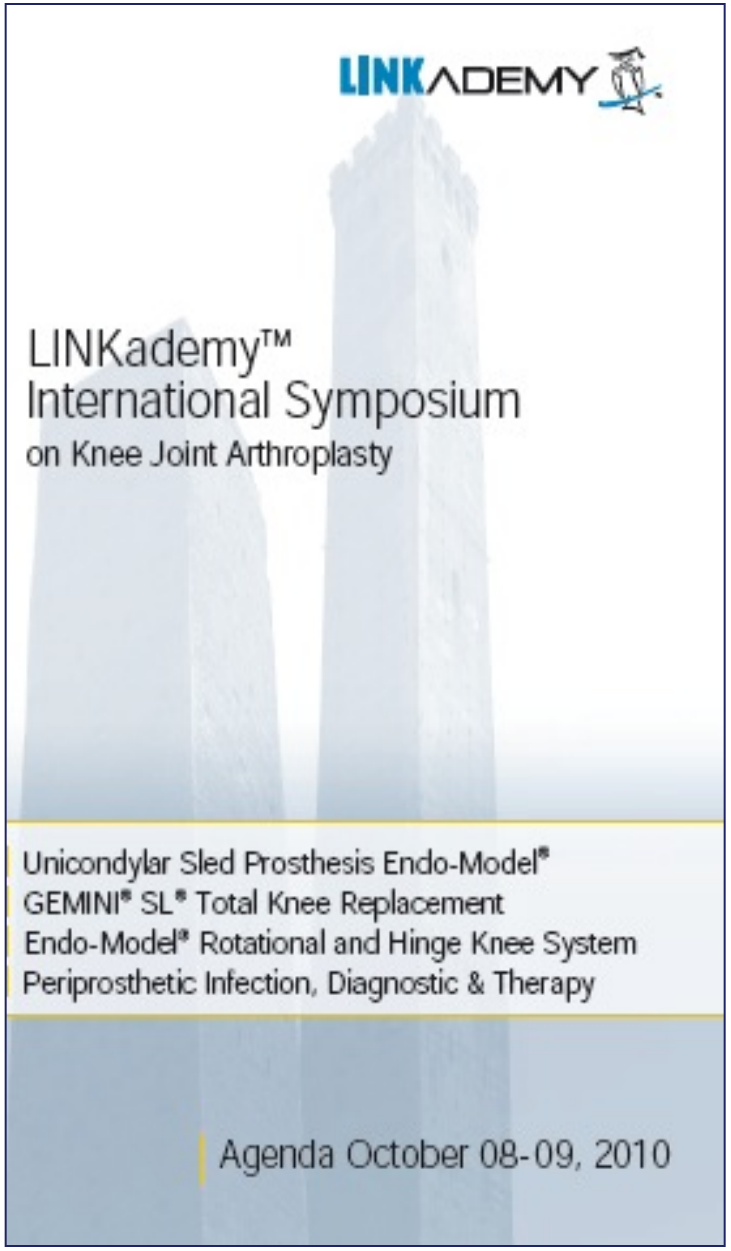


Minimally Invasive Technique in TKA
Clinical Experience and Results

E. Sabetta,
S. Dall'Aglio, C. Ferraù

Arcispedale Santa Maria Nuova
Reggio Emilia - ITALY
S.C. Ortopedia e Traumatologia
Direttore: Ettore Sabetta

SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Azienda Ospedaliera di Reggio Emilia

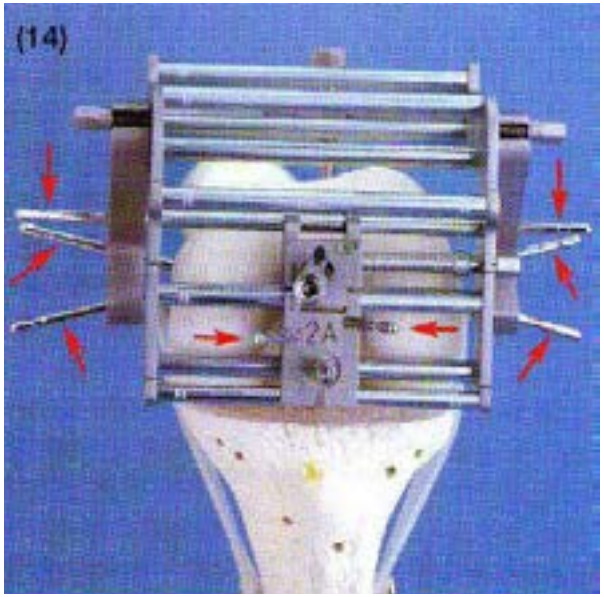
Gemini experience since 2004

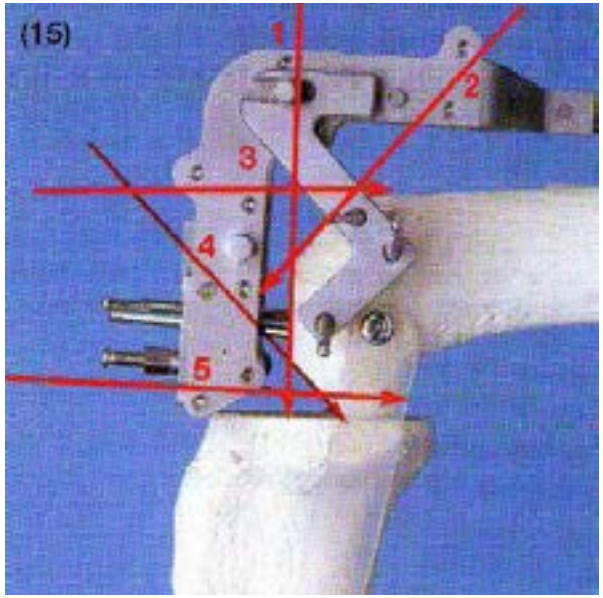
n° 348 implants

Rotating Platform

- Compensates minimal component rotation mistakes
- Reduces stresses at the interface bone/prosthesis
- Improves patellar tracking
- Increases polyethylene congruence
  - Increases stability
  - Reduces polyethylene wear

Ancillary Instrumentation

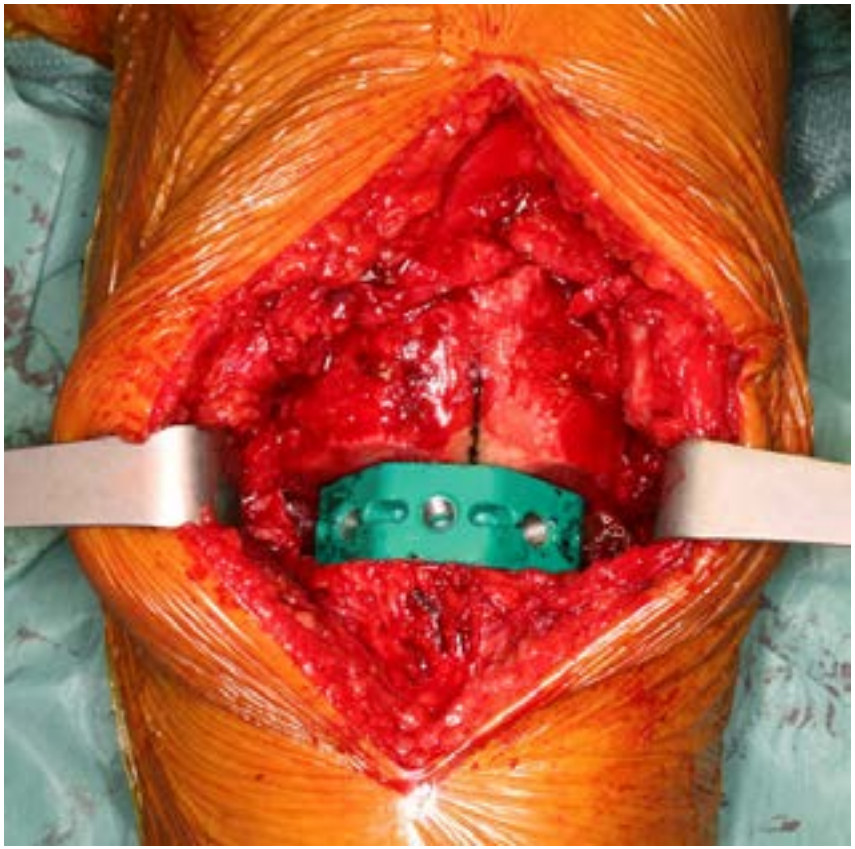




- Bulky ➔ widespread surgical approach required
- Jigs far-off bone ➔ potentially inaccurate cuts (saw bending)

2006: “LIGHT” Instrumentation

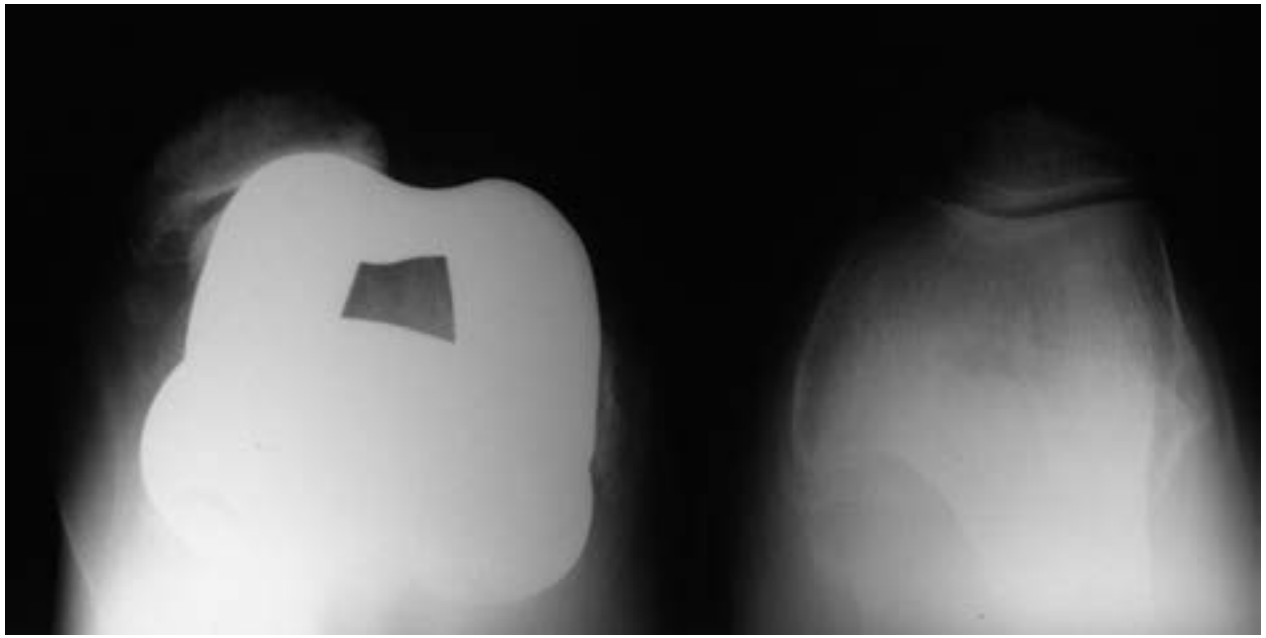
- Extension balancing and polyethylene thickness assessment after proximal tibia and distal femur cuts



Malrotation in TKA

- One of main causes of painful TKA
- One of the more frequent causes of TKA replacement

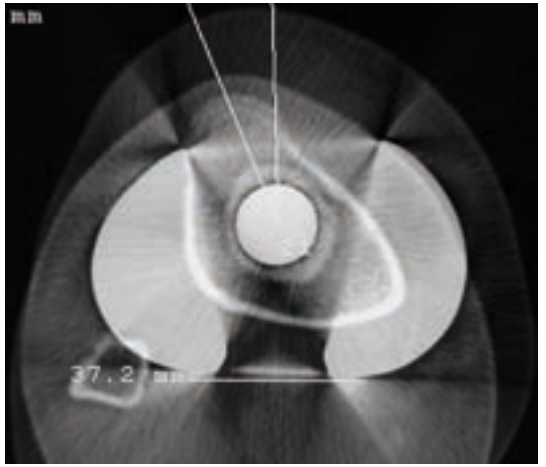
Clayton et al. 1982
Insall et al. 1986
Berger et al. 1998
Jerosch et al. 2002
Kienapfel et al. 2003
Hoffman et al. 2003



Malrotation in TKA

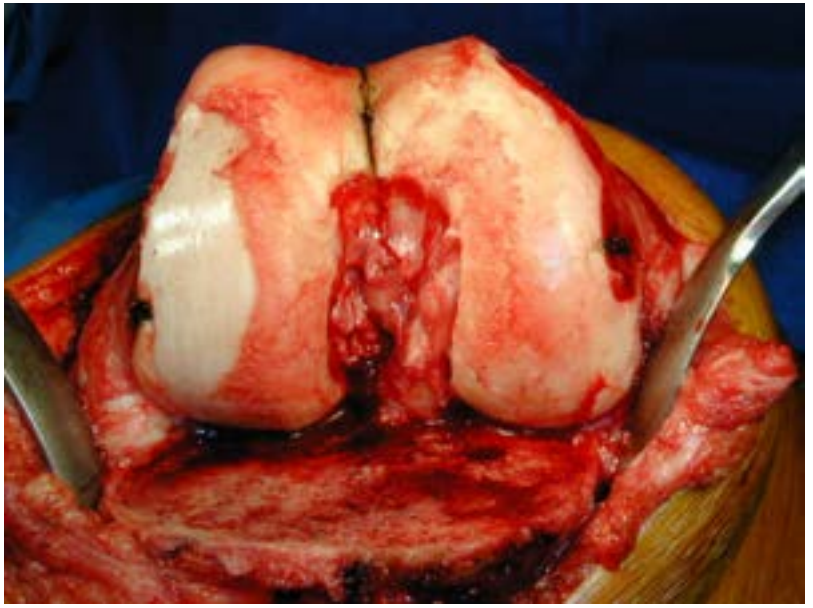
The rotating platform can decrease but doesn't avoid component rotation mistakes and contact pressures

Cheng et al. 2003



“LIGHT” Instrumentation: Femoral Rotational Alignment

- Ligament balancing check in flexion before carrying out the final cuts.

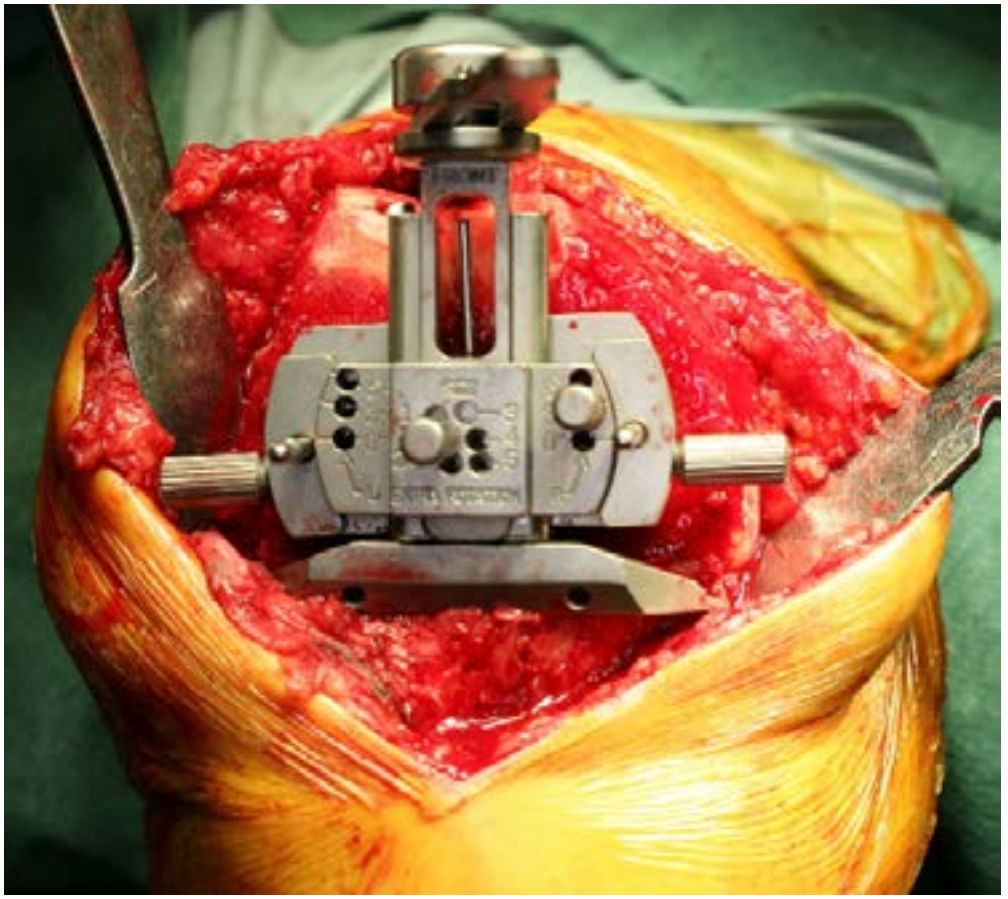


“LIGHT” Instrumentation: Femoral Rotational Alignment

•The jig allows the choice of the external rotation according to prearranged (0°-3°-5°) or varying (Whiteside, ECA) angles.

•The stick checks the alignment with Whiteside axis.

•The handles check the alignment with ECA axis.

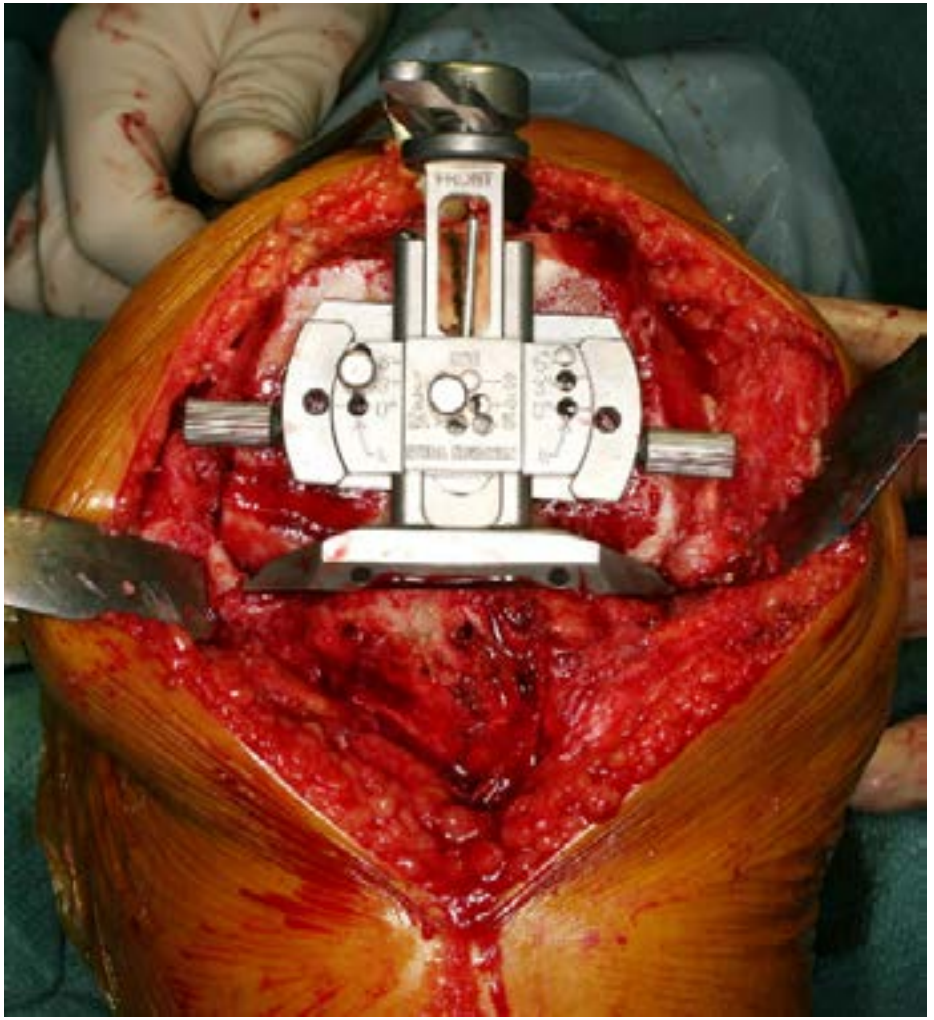


“LIGHT” Instrumentation: Femoral Rotational Alignment

In this case we set 3° of extra-rotation on the PCA; but there is not agreement with Whiteside axis

?

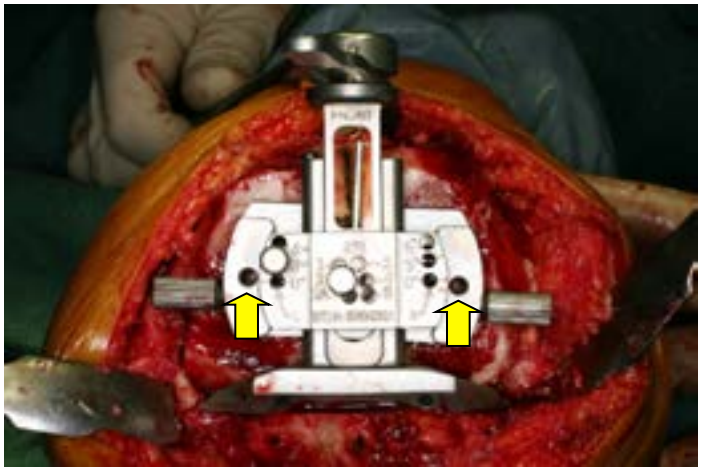
- Error in drawing the Whiteside or ECA
- Degenerated or dysplasic posterior condyles

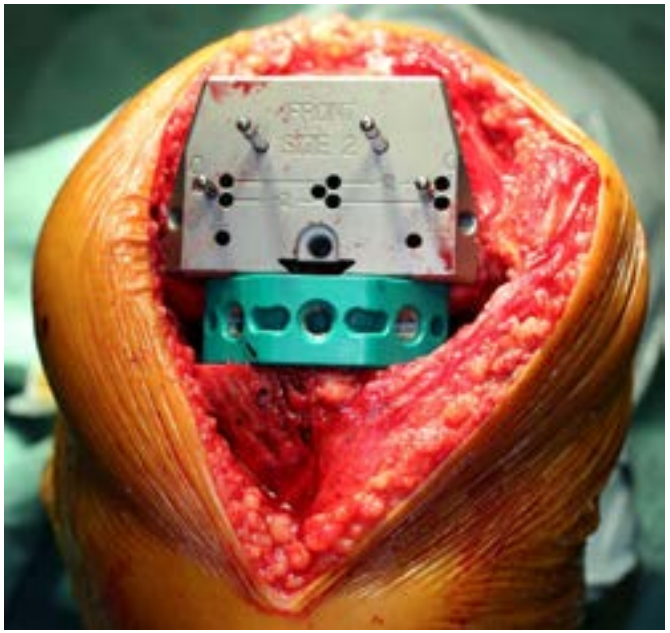


“LIGHT” Instrumentation: Femoral Rotational Alignment

We can accept 3° of extra-rotation on the PCA, but before carrying out the final cuts we check the ligament balancing in flexion,

- we insert two pins into the respective holes, remove the jig and put another one stabilized by two more pins
- we insert the spacer of the same thickness as that used in extension.





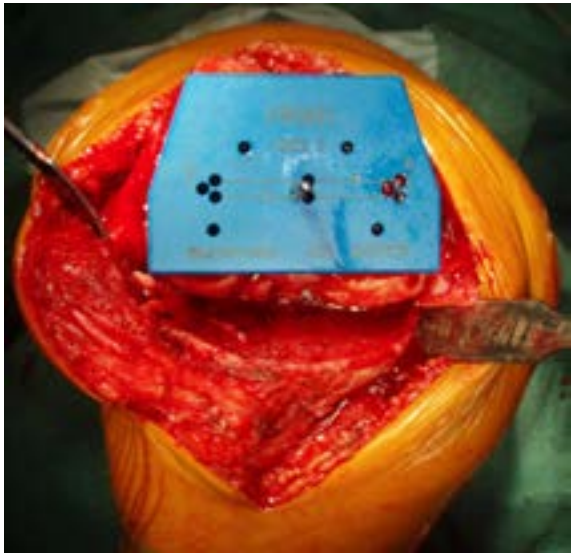
“LIGHT” Instrumentation: Femoral Rotational Alignment

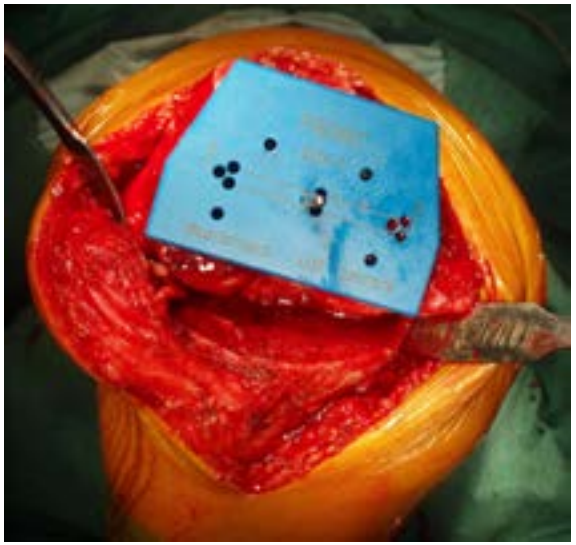
We check the ligament balancing in varus/valgus stress

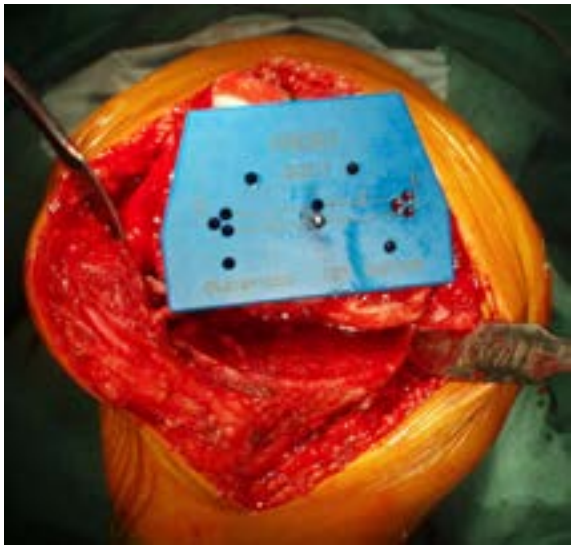
“LIGHT” Instrumentation: Femoral Rotational Alignment

If the balancing is not satisfactory, the jig can be rotated to get rectangular space without additional ligament release. The flexion gap remain unchanged

- put a central pin
- remove the other pins
- rotate the jig until the right position and fix again
- repeat balancing test

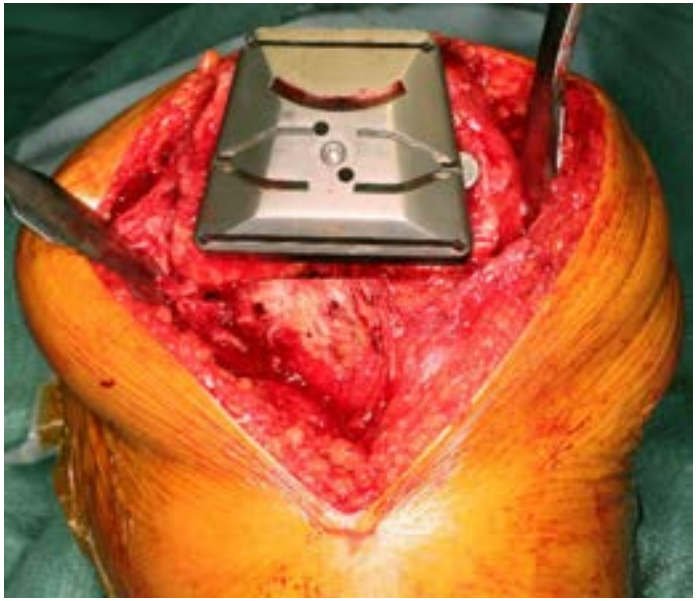


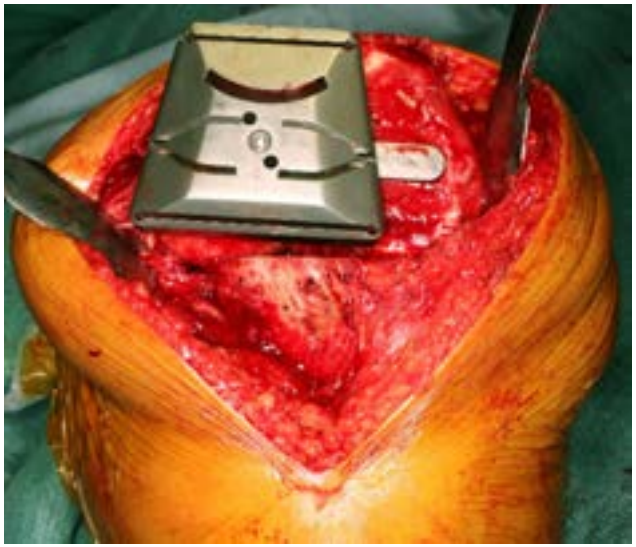


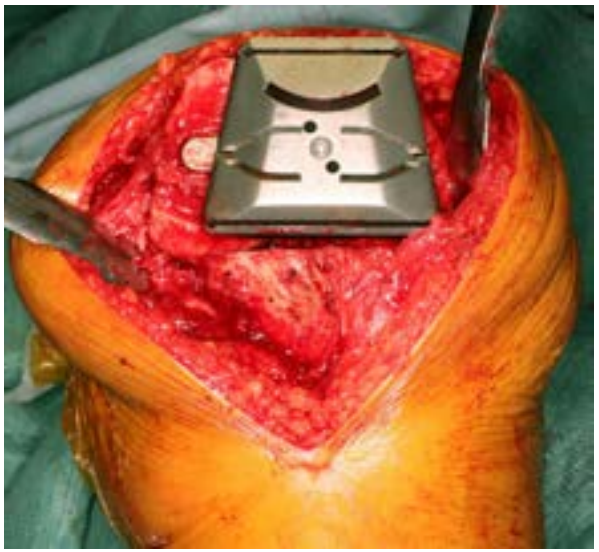


“LIGHT” Instrumentation: Definitive Femoral Cuts

- Small size jig for 4 cuts
- Mobile slide to facilitate the cuts
- Perfect bone contact to reduce saw bending

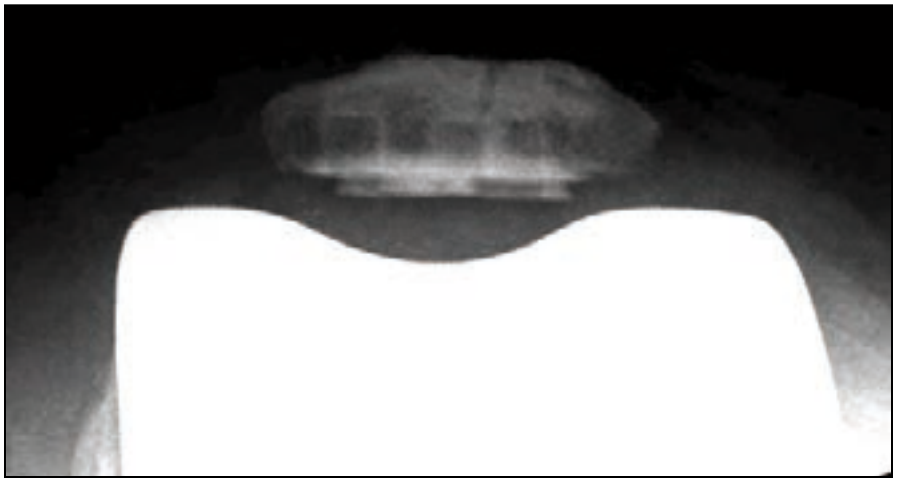






“LIGHT” Instrumentation: ADVANTAGES

- Extension balancing first and assessing polyethylene thickness
  - ⟶ *Correct limb alignment*
  - ⟶ *Knee stability*
- Flexion balancing without additional release
  - ⟶ *Less post-op pain*
- Same flexion /extension gap
  - ⟶ *Knee stability*
- Good patellar tracking
  - ⟶ *Better function*
  - ⟶ *No pain*
  - ⟶ *Faster recovery*



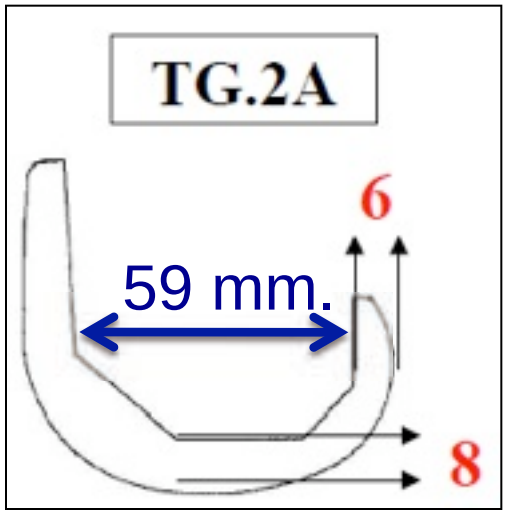
“EXTRA-BONE” Femoral Alignment Instrumentation

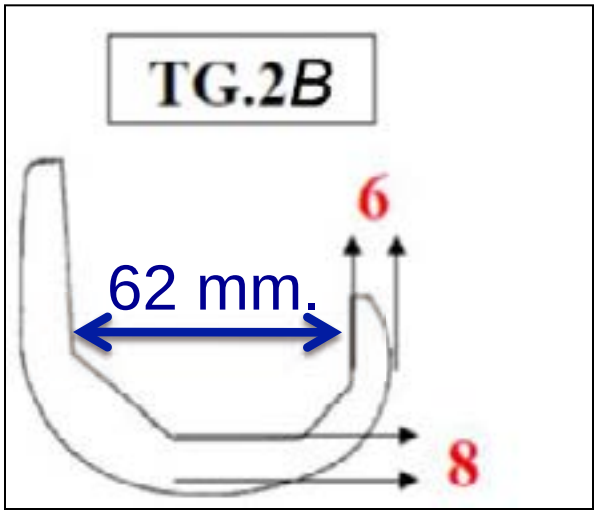
“EXTRA-BONE” Femoral Alignment Instrumentation

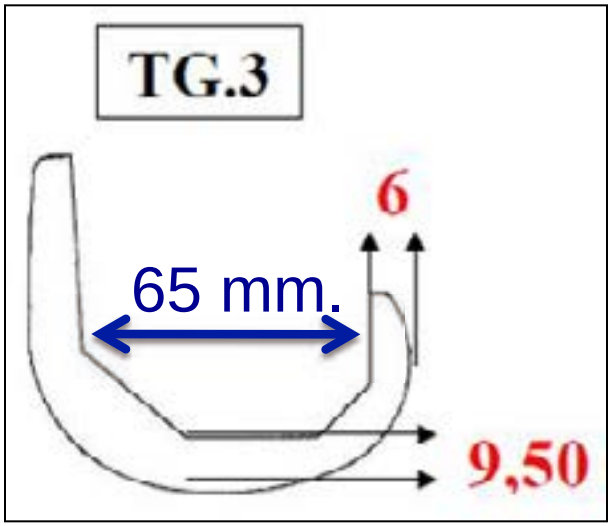
- Tissue sparing (doesn't violate the femoral medullar canal)
- Reduces fat embolism
- Reduces haematoma
- Reduces blood loss
- Distal femur resection on both planes at least accurate as IM technique
- Essential when the femoral medullar canal is deformed or unfit for use

“2 B” size

- 2A and 3 are the more frequent sizes implanted in Italian female population
- 6 mm of difference between 2A and 3 in sagittal plane
- 2B is in between
  - Increases posterior offset of femoral condyles
  - Increases knee flexion







“2 B” size

Posterior femoral offset is particularly important in using conforming polyethylene because the posterior rim is higher than in fixed bearing

R.I.P.O. (Registro Implantologia Protesica Ortopedica)

Primary TKA GEMINI MK II implanted in Emilia Romagna from 2002

Anno intervento	Numerosità
2000	-
2001	-
2002	11
2003	27
2004	113
2005	170
2006	170
2007	176
2008	197
2009	229
Totale	1093

Diagnosi pre-operatoria	Numerosità	%
Gonartrosi primitiva	963	88.1
Deformità	73	6.7
Artrosi post-traumatica	14	1.3
Artrite reumatica	10	0.9
Esito frattura	22	2.0
Altro	11	1.0
Totale	1093	100.0

Tipo di intervento	N. interventi	n. revisioni	% di revisioni
GEMINI MK II – LINK	866	7	0.8

Patients living in Emilia Romagna

R.I.P.O. (Registro Implantologia Protesica Ortopedica)

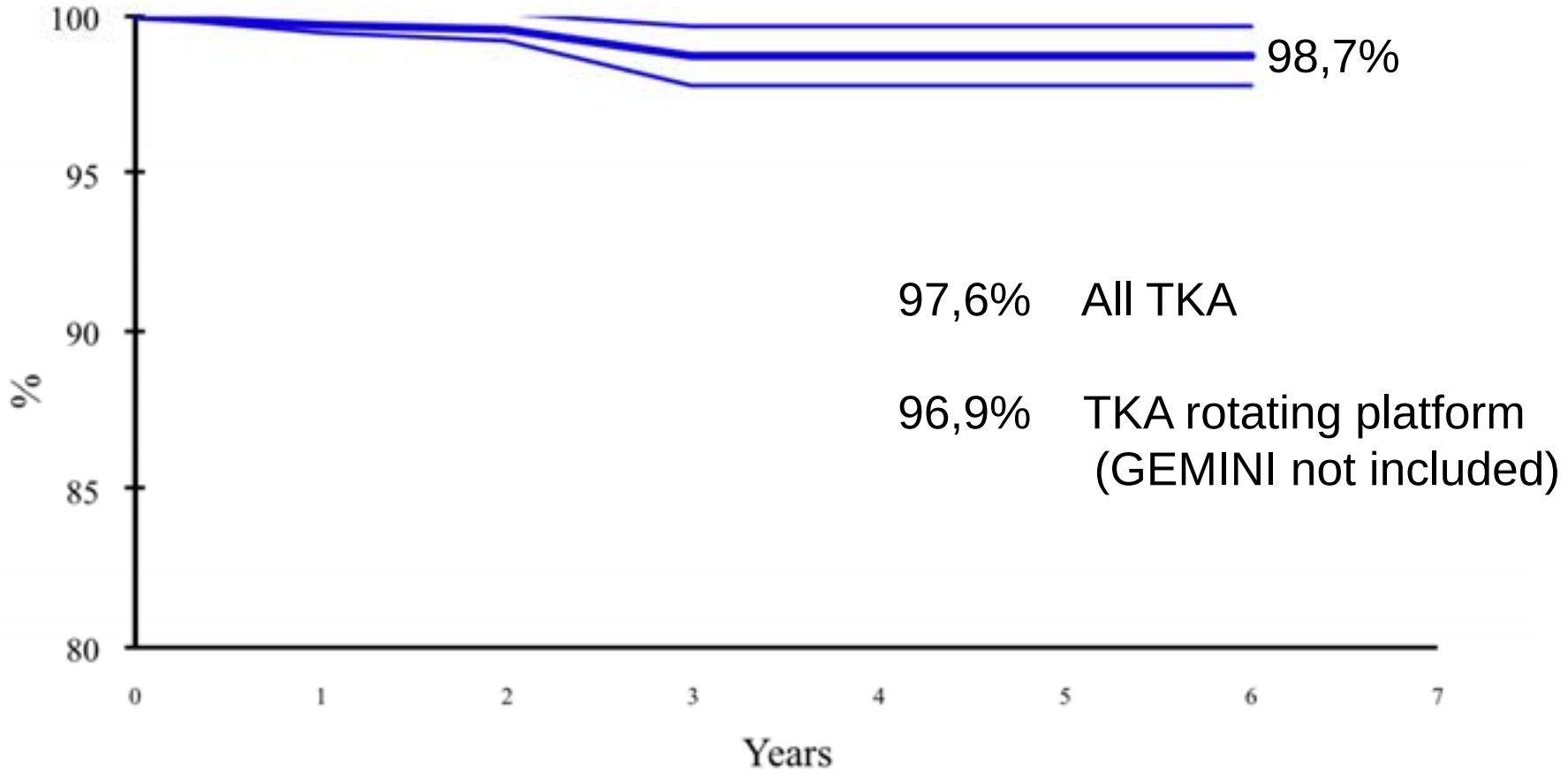
Causes of replacement

Causa reimpianto	Incidenza	Valori percentuali	Distribuzione delle cause di fallimento
Mob. asettica totale	**3**/866	0.35	42.8
Mob. asettica componente tibiale	**1**/866	0.1	14.3
Lussazione protesica	**1**/866	0.1	14.3
Mob. asettica componente femorale	**1**/866	0.1	14.3
Rigidità	**1**/866	0.1	14.3
Totale	**7**/866	**0.8**	**100.0**

Failures for infection are not considered here

R.I.P.O. (Registro Implantologia Protesica Ortopedica)

GEMINI MK II survivorship



97,6% All TKA

96,9% TKA rotating platform (GEMINI not included)

Summary

- M.I.S. means making a good job with minimum surgical trauma
- Good results in TKA depend on design, cinematic properties of the implants and surgical technique
- An accurate instrumentation is critical for the quality and reproducibility of the prosthetic surgery
- Our clinical result are improved with GEMINI “light” and “extra bone” femoral alignment instrumentation

THANKS