



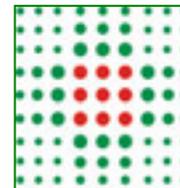
# MONO MEDIALE: INDICAZIONI, ALLINEAMENTO E CINEMATICA

E. Sabetta, A. Timoncini, F. Pinto

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*Struttura Complessa  
Ortopedia e Traumatologia  
Direttore: Ettore Sabetta*

*Arcispedale S. Maria Nuova (I.R.C.C.S.)  
Reggio Emilia*



SERVIZIO SANITARIO REGIONALE  
EMILIA-ROMAGNA  
Azienda Ospedaliera di Reggio Emilia

# PROTESI MONOCOMPARTIMENTALE

50% del mercato



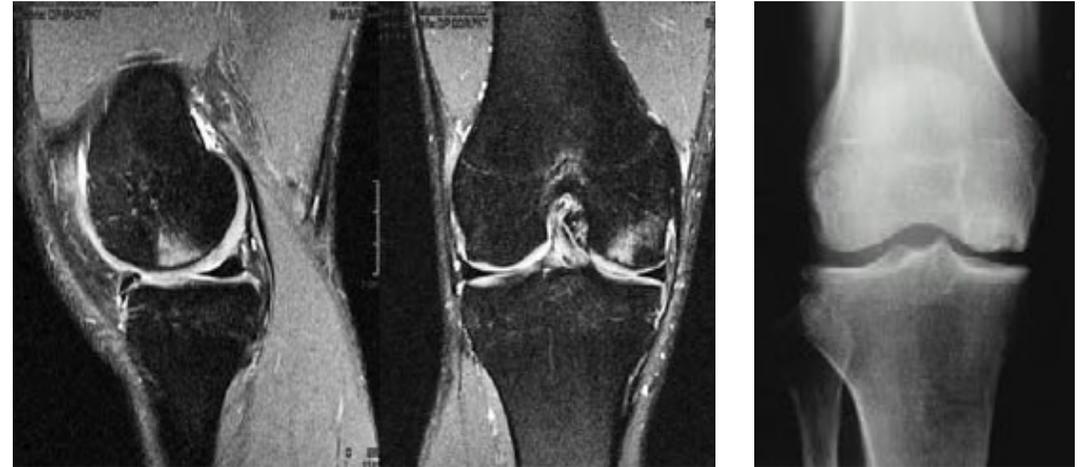
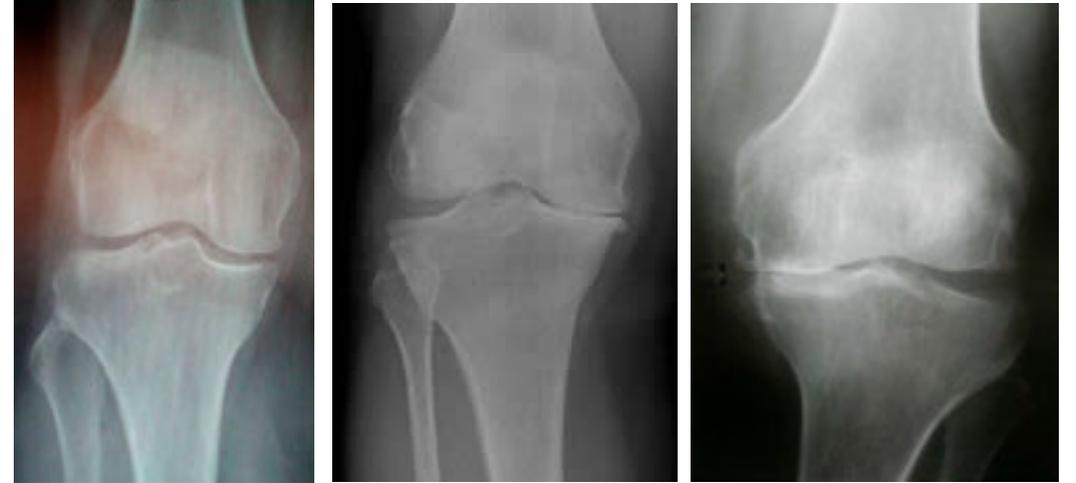
50% del mercato



# INDICAZIONI

# INDICAZIONI

- **SEMPRE, QUANDO SI PUO'**
- ARTROSI/NECROSI  
MONOCOMPARTIMENTALE MEDIALE
- COMPARTO CONTROLATERALE SANO  
(asintomatico)
- LCA STABILE
- FEMORO-ROTULEA ASINTOMATICA
- DEFORMITA' ASSIALE  $<15^\circ$  , DEFICIT  
ESTENSIONE  $<10^\circ$  , ROM  $>90^\circ$



# INDICAZIONI

## R.I.P.O. Emilia Romagna 2014

Anno di intervento	% unicompartim	% bicompartim	% tricompartim
2001	10,2	81,3	8,5
2002	12,7	80,1	7,2
2003	12,8	78,6	8,7
2004	12,9	75,7	11,3
2005	12,4	75,6	12,0
2006	10,8	69,9	19,2
2007	11,6	69,3	19,2
2008	11,5	72,2	16,3
2009	13,0	72,3	14,8
2010	12,5	71,5	16,0
2011	9,8	73,4	16,8
2012	10,5	72,3	17,2
2013	12,1	69,1	18,8
2014	10,8	68,2	21,0

## CASISTICA PERSONALE 2017

Mono	25
PTG (bi-tri)	44
Reimpianti	9
Espianti senza reimpianto	2
<b>TOTALE</b>	<b>80</b>

**ALLINEAMENTO**

# PROTESI MONOCOMPARTIMENTALE

## TECNICA TRADIZIONALE

- guide intra-midollari
- blocchi spaziatori



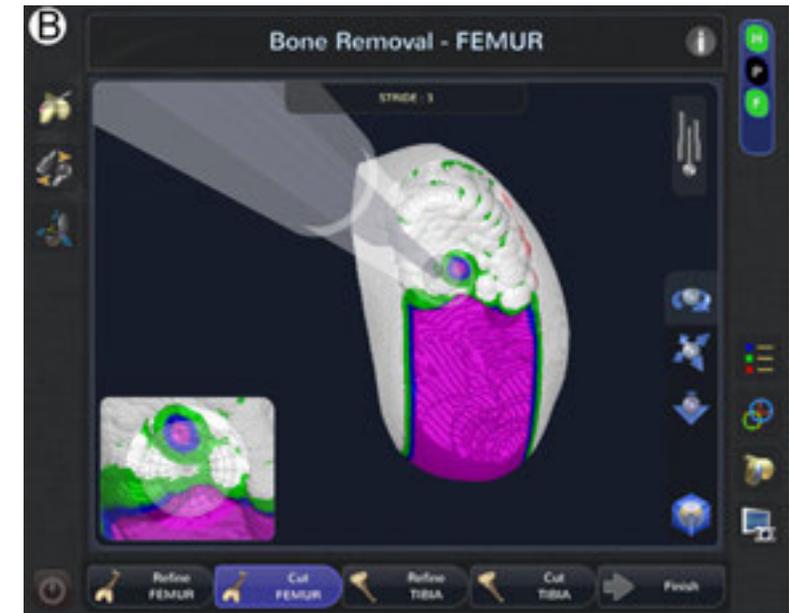
## PATIENT-SPECIFIC INSTRUMENTATION

- guide di taglio monouso
- pianificazione TC/RM guidata



## NAVIGATORE o ROBOT

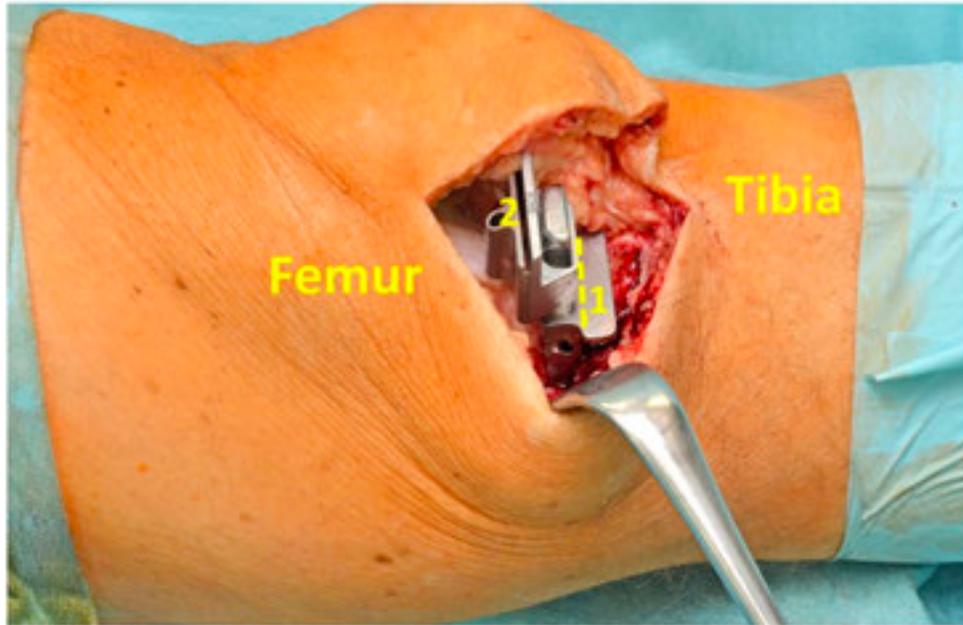
- pianificazione intraoperatoria
- non necessarie guide di taglio



# ALLINEAMENTO

*Arch Orthop Trauma Surg.* 2018 Feb 26. doi: 10.1007/s00402-018-2911-3. [Epub ahead of print]

**The femoral component alignment resulting from spacer block technique is not worse than after intramedullary guided technique in medial unicompartmental knee arthroplasty.**



In conclusion, the results show that the spacer block technique produces results comparable to the intramedullary guided technique, but less precise than those using navigation or robotics. Overall, the precision is low, and outliers frequent. Due to the possibility of transferring a tibial malalignment to a femoral malalignment, even greater attention should be paid to the precision of tibial resection in the spacer block technique.

**Fig. 1** Intraoperative photograph showing the spacer block technique on a left knee (1 = spacer block on the tibia cut; 2 = cutting guide for the distal femoral resection)

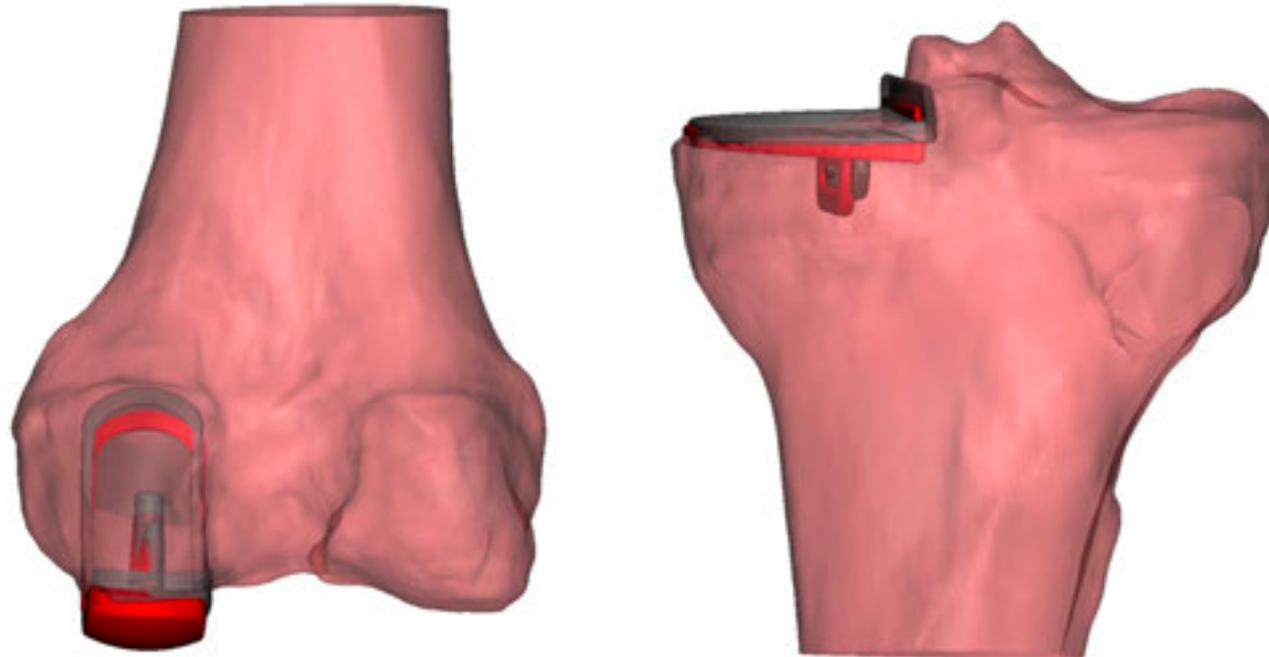
# ALLINEAMENTO

*Knee Surg Sports Traumatol Arthrosc.* 2017 Dec 27. doi: 10.1007/s00167-017-4826-x. [Epub ahead of print]

## **Patient-specific instrumentation in Oxford unicompartmental knee arthroplasty is reliable and accurate except for the tibial rotation.**

Kerens B<sup>1</sup>, Leenders AM<sup>2</sup>, Schotanus MGM<sup>3</sup>, Boonen B<sup>4</sup>, Tuinebreijer WE<sup>5</sup>, Emans PJ<sup>4</sup>, Jong B<sup>2</sup>, Kort NP<sup>6</sup>.

**CONCLUSION:** PSI in Oxford UKA surgery is reliable and accurately translates the preoperative plan into the in vivo situation, except for the tibial rotational position. The preoperative planning is a crucial step in avoiding re-resections that can cause angular deviations in prosthesis position, especially in tibial component rotational position. It is advised to avoid re-resections and to consider this while planning the PSI procedure.



# ALLINEAMENTO

*Gait Posture*. 2018 Mar 6;62:41-45. doi: 10.1016/j.gaitpost.2018.02.029. [Epub ahead of print]

## **A comparison of gait one year post operation in an RCT of robotic UKA versus traditional Oxford UKA.**

Motesharei A<sup>1</sup>, Rowe P<sup>2</sup>, Blyth M<sup>3</sup>, Jones B<sup>3</sup>, Maclean A<sup>3</sup>.

### **⊕ Author information**

#### **Abstract**

Robot-assisted unicompartmental knee surgery has been shown to improve the accuracy of implant alignment. However, little research has been conducted to ascertain if this results in a measureable improvement in knee function post operatively and a more normal gait. The kinematics of 70 OA knees were assessed using motion analysis in an RCT (31 receiving robotic-assisted surgery, and 39 receiving traditional manual surgery) and compared to healthy knees. Statistically significant kinematic differences were seen between the two surgical groups from foot-strike to mid-stance. The robotic-assisted group achieved a higher knee excursion (18.0°, SD 4.9°) compared to the manual group (15.7°, SD 4.1°). There were no significant difference between the healthy group and the robotic assisted group, however there was a significant difference between the healthy group and the manual group ( $p < 0.001$ ). Hence robotically-assisted knee replacement with Mako Restoris Implants appears to lead not only to better implant alignment but also some kinematic benefits to the user during gait.

**KEYWORDS:** Gait; Kinematics; Robotic-assisted arthroplasty; Unicompartmental knee replacement; Walking

# ALLINEAMENTO

## Original Article

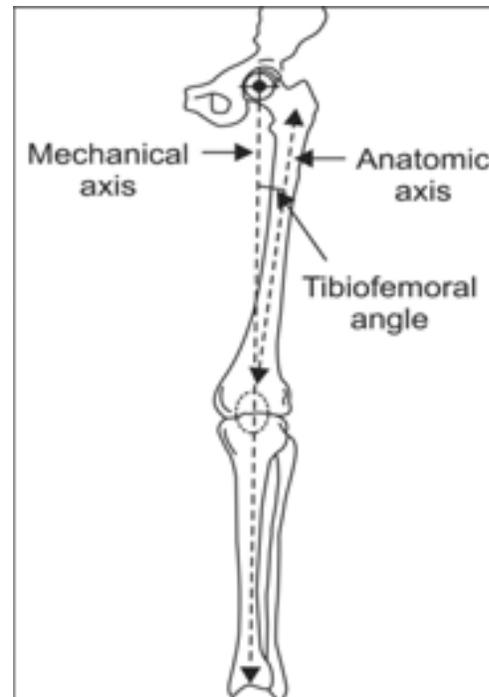
Knee Surg Relat Res 2012;24(2):85-90  
http://dx.doi.org/10.5793/korr.2012.24.2.85  
pISSN 2234-0726 · eISSN 2234-2451

**KSRR**  
Knee Surgery & Related Research

## The Influence of Postoperative Tibiofemoral Alignment on the Clinical Results of Unicompartmental Knee Arthroplasty

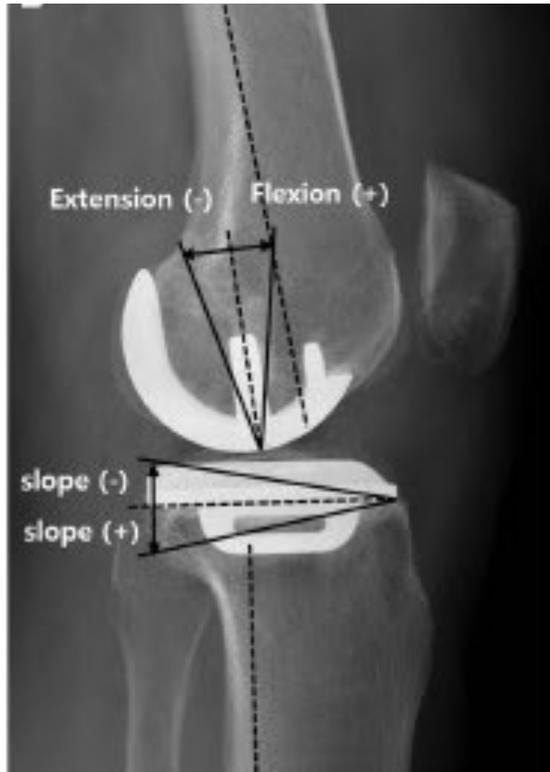
Kyung Tae Kim, MD, Song Lee, MD, Tae Woo Kim, MD, Jung Soo Lee, MD and Kyung Hwan Boo, MD  
Department of Orthopedic Surgery, Seoul Sacred Heart General Hospital, Seoul, Korea

- **ANGOLO FEMORO-TIBIALE POST-OPERATORIO: 4° - 6°**
- **LASSITA' COMPARTO MEDIALE IN ESTENSIONE: 1-2 mm**

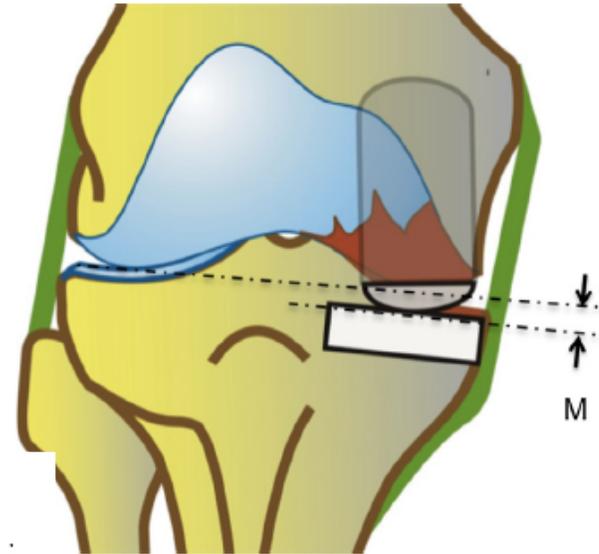


# ALLINEAMENTO

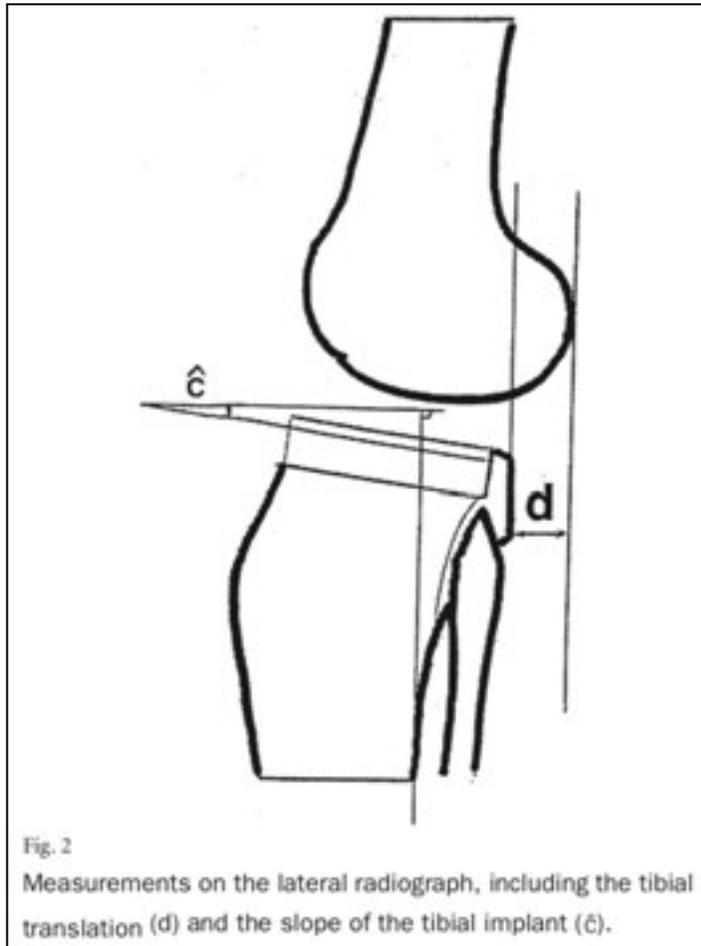
- RIPRISTINO SLOPE TIBIALE NATIVO



- RIPRISTINO ALTEZZA DELLA RIMA ARTICOLARE



**Figure 2** Height of the prosthetic joint space. *M* measures the height difference between the tangent to the articular surface of the tibial implant and the lateral femoro-tibial joint space.



## SLOPE POSTERIORE

3° - 7° migliore compromesso tra funzionalità (flessione), rischio traslazione anteriore, rischio eccessivo stress sul LCA Whiteside LA e Amador DD, 1988; Hernigou F e Deschamps G, 2004

# ALLINEAMENTO

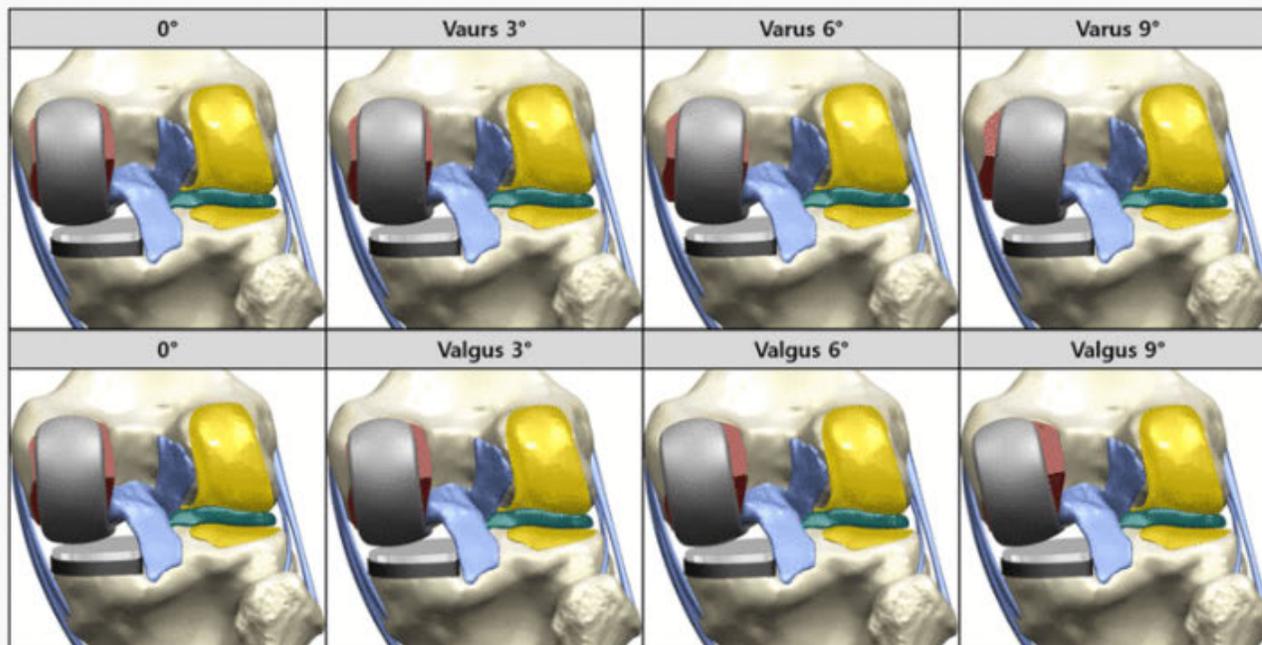
Archives of Orthopaedic and Trauma Surgery (2018) 138:563–572  
<https://doi.org/10.1007/s00402-018-2884-2>

KNEE ARTHROPLASTY



## Femoral component alignment in unicompartmental knee arthroplasty leads to biomechanical change in contact stress and collateral ligament force in knee joint

Kyoung-Tak Kang<sup>1</sup> · Juhyun Son<sup>1</sup> · Changhyun Baek<sup>2</sup> · Oh-Ryong Kwon<sup>3</sup> · Yong-Gon Koh<sup>3</sup>



**Fig. 2**

Schematic of FE models with femoral malalignment from varus 9° to valgus 9°

### VARO rispetto a neutro

- Aumento stress sul PE (+)
- Aumento stress contatto sul piatto laterale
- Aumento stress su MCL

### VALGO rispetto a neutro

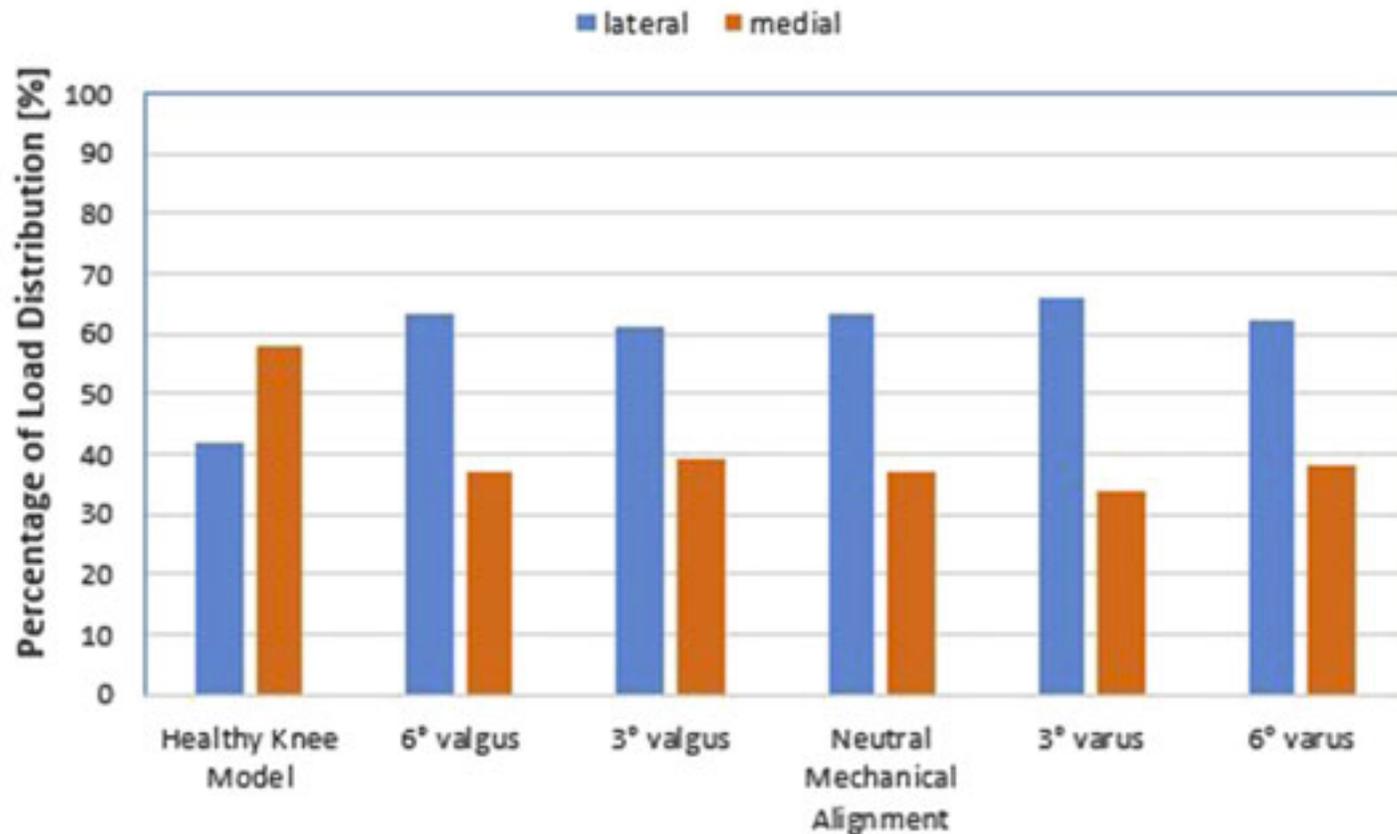
- Aumento stress sul PE (++)
- Riduzione stress contatto sul piatto laterale
- Aumento stress su MCL e LCL

# ALLINEAMENTO

*J Arthroplasty*. 2016 Dec;31(12):2685-2691. doi: 10.1016/j.arth.2016.07.006. Epub 2016 Jul 15.

## Biomechanical Effects of Different Varus and Valgus Alignments in Medial Unicompartmental Knee Arthroplasty.

Innocenti B<sup>1</sup>, Pianigiani S<sup>2</sup>, Ramundo G<sup>3</sup>, Thienpont E<sup>4</sup>.



Modulo elastico comparto laterale/PE

- Cartilagine femoro-tibiale: 15 Mpa

- Insetto PE: 685 MPa

Fig. 3. Percentages of load distribution between lateral (blue) and medial (orange) compartments for all the investigated configurations.

# CINEMATICA

# CINEMATICA

**PIATTO FISSO.** L'utilizzo del menisco fisso nella protesi monocompartimentale riproduce sostanzialmente la stessa cinematica del ginocchio artrosico con il medesimo "pattern" di usura del polietilene. Il carico sul polietilene è puntiforme.

**PIATTO MOBILE.** Realizza un modello di doppia congruenza round on round – flat on flat che conferisce al ginocchio una cinematica vantaggiosa con ridotta usura del polietilene.

Ne deriva la validità dell'apparente paradosso espresso nel '78 da Goodfellow ed O' Connor secondo i quali una protesi condilare può conferire la maggiore stabilità articolare se questa è completamente instabile.

J Bone Joint Surg Br. 1978 Aug;60-B(3):358-69.

**The mechanics of the knee and prosthesis design.**

Goodfellow J, O'Connor J.

# TAKE HOME MESSAGES

- **Un ginocchio con una MONO MEDIALE ben messa funziona meglio di uno con una protesi totale**
- **Quindi la MONO MEDIALE deve essere preferita ogni volta che si può**
- **Il corretto impianto di una MONO MEDIALE è difficile perché molteplici sono i parametri meccanici da rispettare**
- **La robotica e la navigazione sono superiori alla tecnica tradizionale per quanto riguarda l'allineamento delle componenti e offrono risultati ripetibili**
- **Piatto «mobile» sovrapponibile a piatto «fisso» nella funzionalità del ginocchio e nei risultati**

**GRAZIE**

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