From normal to hyperflexion

Val D'Isère 2012

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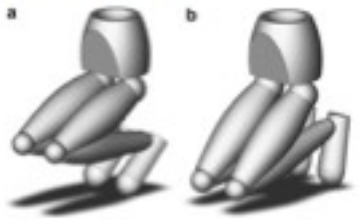
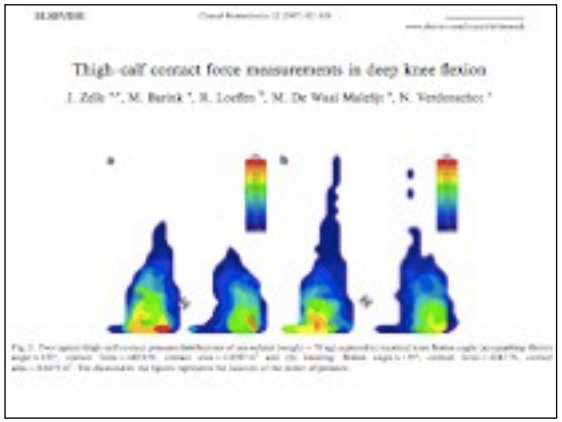
Normality

- Active flexion 125°
- Passive flexion 150°

Normality

- Squatting vs Kneeling



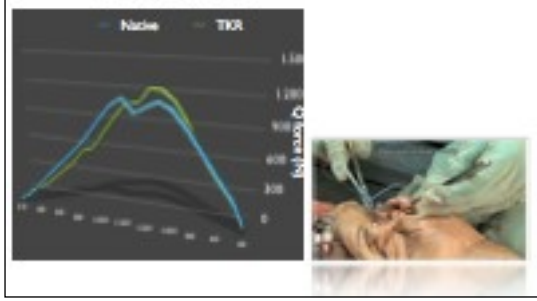


Thigh–calf contact force measurements in deep knee flexion

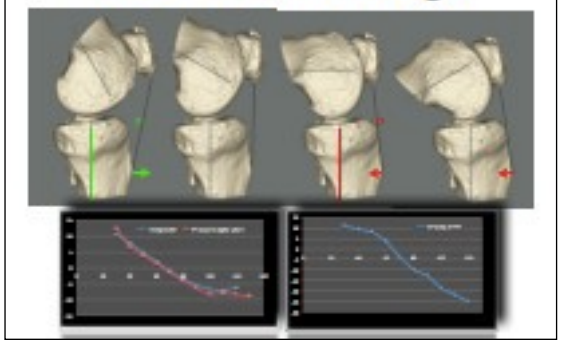
J. Zelle **, M. Barink *, R. Loeffen *, M. De Waal Malefijt *, N. Verdonschot *

Impact of knee flexion on quad's load

- ankle load 130N



Patellar tendon angle

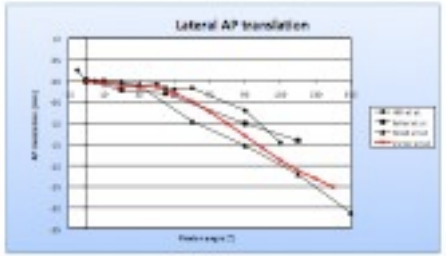


Flexion requirements for ADL

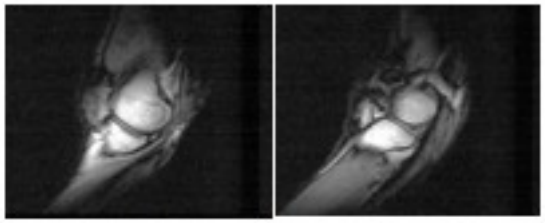
- Stair climbing: 80°
- Sitting: 90°
- Shoelace tying: 105°
- Lifting object from the ground: 70°
- Individual variation, depending on patient height and hip mobility
- The smaller the patient, the more flexion is needed

Passive Kinematics

Passive Kinematics

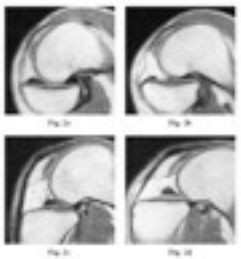


Native knee



Courtesy Andy Williams

Native knee



Can this mechanism be replicated in TKA?

Anatomic contours - tibia

medial

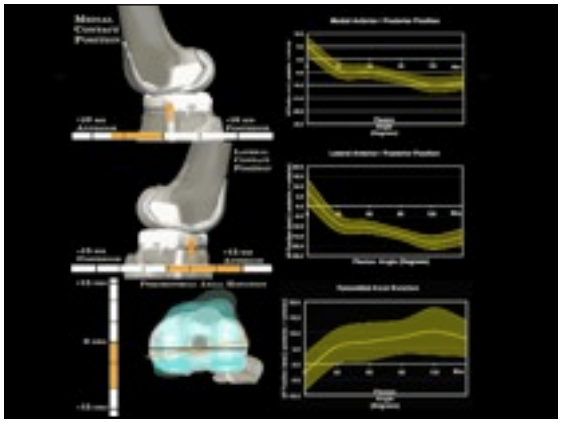
lateral

Anatomic contours

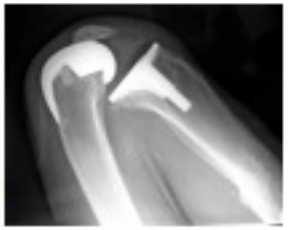
- Cupped medial compartment

Anatomic contours

- Sloped lateral compartment



Can this mechanism be replicated in TKA?



Can this mechanism be **safely** replicated in TKA?

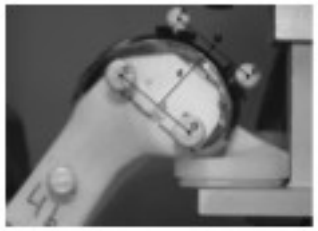
Potential cost of high-flexion

- Cam-post dislocation
- ITB traction syndrome
- Femoral component loosening
- Patellar complications
- Anterior knee pain

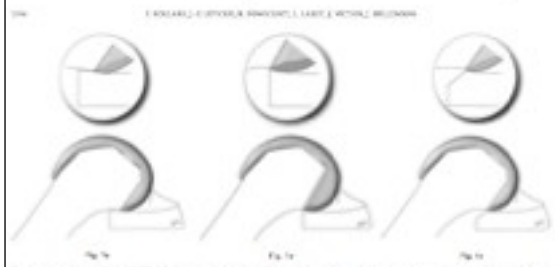
KNEE RESEARCH

Femoral component loosening in high-flexion total knee replacement

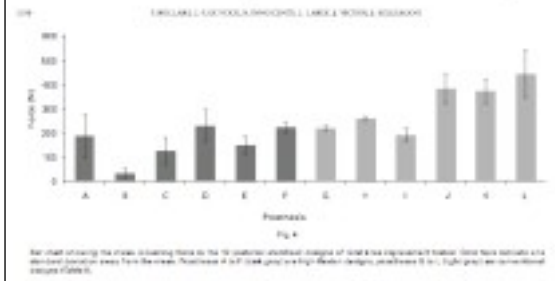
AN IN VITRO COMPARISON OF HIGH-FLEXION VERSUS CONVENTIONAL DESIGNS



Femoral component loosening



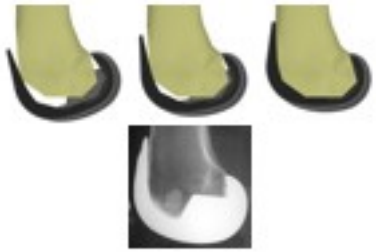
Femoral component loosening



Does High-Flexion Total Knee Arthroplasty Promote Early Loosening of the Femoral Component?

Jorrit Zelle,[1] Dennis Janssen,[1] Yolanda Van Eijden,[1] Maarten De Waal Malefijt,[2] Nico Verdonschot[1,3]

Closed box geometry



Iliotibial band traction syndrome in guided motion TKA
A new clinical entity after TKA

Lucas Luyckx, Thomas Luyckx, Johan Bellemans, Jan Victor

Conclusion

- High flexion characterized by specific kinematics
- TKA can be designed to adapt to high flexion
- The compromises come at a cost