Higher Axial Tibiofemoral Rotation And Functional Outcomes With Mobile-Bearing Total Knee Arthroplasty Compared To Fixed-Bearing At One-But Not At Two-Year Follow-Up - A Randomized Clinical Trial

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I have no financial conflicts to disclose.
Fixed-Bearing TKA:
- Excellent results
- Polyethylene wear-related problems

Mobile-Bearing TKA:
- Possible reduction in polyethylene wear and osteolysis
- Generating less stress between components
Three-dimensional (3D) in vivo kinematics analysis

- Evaluation of processes in prosthetic knee
- Changes in knee kinematics can develop after TKA
- Better understanding of in vivo kinematics

✓ May help determine diagnosis of implant failures
OBJECTIVE

To determine in vivo knee kinematics and clinical outcomes of patients who underwent fixed- and mobile-bearing TKA at one- and two-year follow-up.
METHODS

- Double-blinded randomized controlled trial
- CONSORT Guideline
- Two groups: Fixed- and Mobile Bearing TKA
- 3D in vivo knee kinematics analysis
- Function: KOS-ADLS and VAS
- One- and two-year follow-up (FU)
3D In Vivo Knee Kinematics Analysis and Functional Outcomes after Fixed- and Mobile-Bearing TKA - Randomized Clinical Trial

RESULTS

- 328 patients evaluated
- Final sample size: 64 patients
- Fixed-bearing TKA group: N=32
- Mobile-bearing TKA group: N=32
- No loss of follow-up
RESULTS

3D Kinematics Analysis at one-year follow-up

- Mobile-bearing TKA had higher mean axial tibiofemoral rotation during
  - Gait
  - Stepping up
  - Getting up from a chair

- No differences at two-year FU

<table>
<thead>
<tr>
<th>Activity</th>
<th>Fixed-Bearing TKA (n = 32)</th>
<th>Mobile-Bearing TKA (n = 32)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gait</td>
<td>10.7 ± 4.3</td>
<td>13.3 ± 3.1</td>
<td>0.008</td>
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<tr>
<td>Stepping up</td>
<td>10.0 ± 4.8</td>
<td>12.8 ± 4.3</td>
<td>0.013</td>
</tr>
<tr>
<td>Stepping down</td>
<td>9.5 ± 4.7</td>
<td>11.1 ± 4.1</td>
<td>0.160</td>
</tr>
<tr>
<td>Getting up from a chair</td>
<td>12.1 ± 6.9</td>
<td>16.1 ± 7.6</td>
<td>0.031</td>
</tr>
<tr>
<td>Sitting on a chair</td>
<td>12.9 ± 7.7</td>
<td>15.4 ± 7.7</td>
<td>0.209</td>
</tr>
</tbody>
</table>
RESULTS

Functional outcomes at one- and two-year follow-up

- Mobile-bearing TKA had KOS-ADLS function score at one-year
- No differences at two-year FU
DISCUSSION

MAIN FINDINGS

✓ Mobile-bearing TKA had higher degree of axial rotation and better functional outcomes at one-year FU

○ Previous short-term FU studies also reported more internal tibial rotation with mobile-bearing TKA

○ Correlation between higher axial rotation and better functional outcomes
DISCUSSION

MAIN FINDINGS

✓ No difference between fixed- and mobile-bearing TKA at two-year FU

- In agreement with previous mid-term and long-term FU studies
- Hardening effect?
  - At certain period of time mobile tibial insert would behave kinematically similar to fixed tibial insert
CONCLUSION

Mobile-bearing TKA allowed higher degree of rotation when walking, stepping up stairs and standing up from a chair and had higher functional outcomes compared to fixed-bearing TKA at one-year follow-up. However, no difference in in vivo kinematics nor in clinical outcomes was observed between fixed- and mobile-bearing prostheses at two-year follow-up.
REFERENCES


