

Risk Factors for Increased Sagittal Pelvic Mobility in Patients Undergoing Total Hip Replacement

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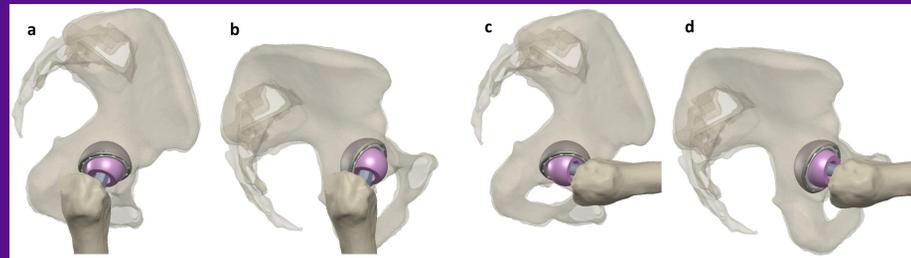
BACKGROUND

- 17% of total hip replacement (THR) patients have excessive sagittal pelvic rotation preoperatively. This increased pelvic rotation could be a risk factor for instability and edge-loading in both flexion and/or extension, Figure 1.

OBJECTIVE

To investigate how gender, age and lumbar degenerative disease affect the number of patients at risk of excessive sagittal pelvic rotation.

Figure 1. a) anterior rotation in standing. b) posterior rotation in standing. c) anterior rotation in flexion and d) posterior rotation in flexion.



METHODS

- 3,428 patients undergoing THR had their pelvic tilt (PT) and lumbar lordotic angle (LLA) measured in supine, standing and flexed seated as part of routine planning for THR, Figure 2.
- “At risk” pelvic mobility classified as:
 - ≥ 13° posterior rotation from supine-stand (extension risk)
 - ≥ 13° anterior rotation from supine-flexed seated (flexion risk)
- Patients stratified by age, gender, lumbar flexion and pelvic incidence and the % “at risk” identified in each group
- Lumbar flexion was defined as the difference between lumbar lordosis when standing and when sitting
 - Low lumbar flexion = stiff spine
 - High lumbar flexion = flexible spine

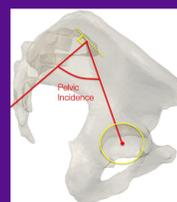


Figure 3. % of patients with “at risk” pelvic mobility by age

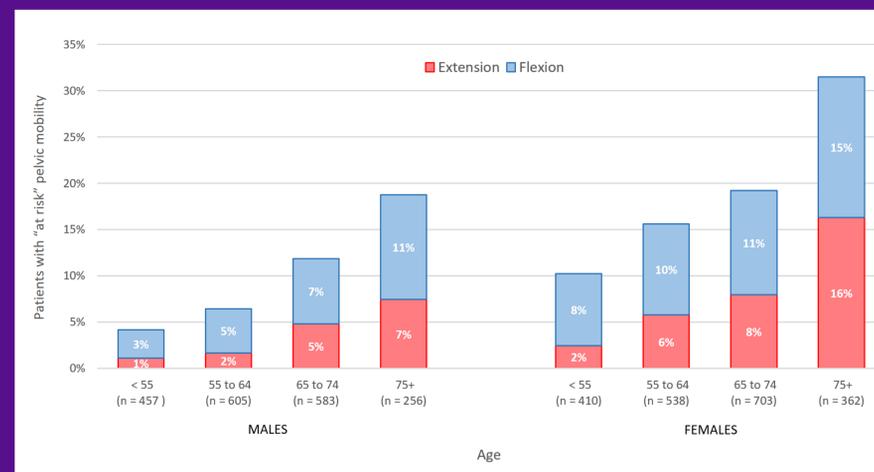
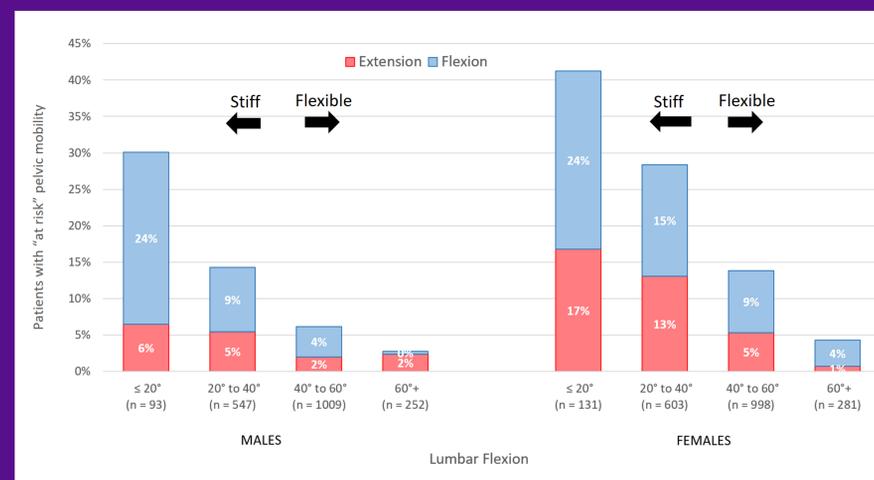


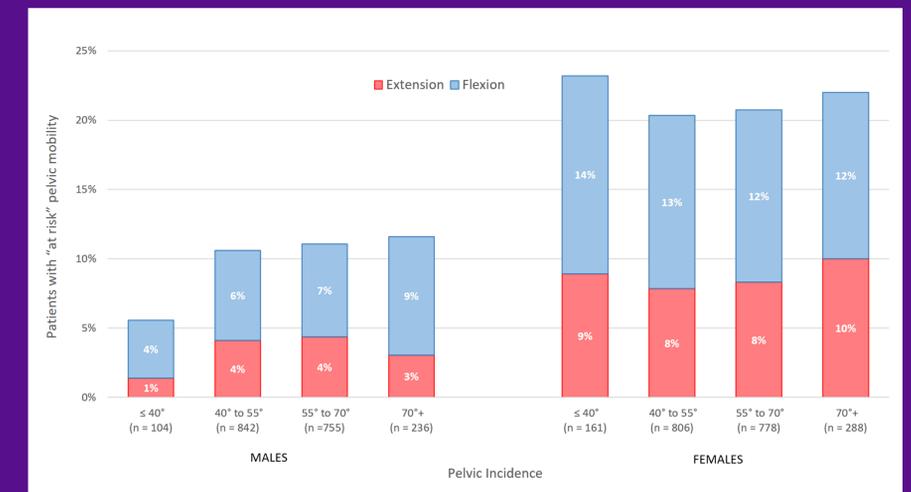
Figure 4. % of patients with “at risk” pelvic mobility by lumbar stiffness



RESULTS

- Posterior pelvic rotation from supine-to-stand increased with age and decreasing lumbar flexion, Figures 3 and 4. This was more pronounced in females. Similarly, anterior pelvic rotation from supine-to-flex seated increased with age and decreasing lumbar flexion, Figure 4. This was more pronounced in males. Notably, 31% of elderly females had excessive pelvic rotation. Furthermore, 41% of patients with lumbar flexion <20° had excessive pelvic rotation.

Figure 5. % of patients with “at risk” pelvic mobility by pelvic incidence



CONCLUSIONS

- Increased incidence of “at risk” pelvic mobility with:
 - Females
 - Elderly
 - Patients with stiff spines
- Additional stability, such as a dual mobility articulation, might be advisable in the elderly, and in patients with limited lumbar flexion
- Pelvic Incidence had minimal affect on pelvic mobility, Figure 5.
- The large range of pelvic mobility in each sub group, supports individual analysis on all patients undergoing THR