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.

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.

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-flex 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

OBJECTIVE

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

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.

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• The large range of pelvic mobility in each sub group, supports individual analysis on all patients undergoing THR