Paper #9

THA Patients with Fixed Spinopelvic Alignment from Standing to Sitting are at Higher Risk of Hip Dislocation

Christina I. Esposito, PhD, Kaitlin M. Carroll, Peter K. Sculco, MD, Douglas E. Padgett, MD, **Seth A. Jerabek, MD**, David J. Mayman, MD

Introduction: Sitting radiographs have been used as a preoperative tool to consider an ideal, patient-specific THA component position that would improve hip stability. This study sought to determine whether patients who dislocated following THA have different spinopelvic alignment or different sitting acetabular component position compared to patients that did not dislocate.

Methods: From 2014 to 2017, all patients undergoing primary THA by two surgeons underwent standing and sitting radiographs from the thoracolumbar junction to the ankles using the EOS imaging system. We compared 12 patients (1% of all patients) who dislocated within the first year of surgery to 150 patients who did not dislocate, and subcategorized patients as having normal spines or spine disease. Alignment parameters, including lumbar lordosis and sacral slope, were measured as well as spine flexion and hip flexion from standing to sitting positions. Postoperative cup alignment was measured in standing and sitting positions.

Results: Dislocators had less spine flexion (13° vs 21°; $p<0.001$), less change in pelvic tilt (9° vs 16°; $p<0.001$), and more hip flexion (72° vs 67°; $p=0.003$) from standing to sitting positions compared to patients with normal spines. Similarly, patients with spine disease had less spine flexion ($p<0.001$), less change in pelvic tilt ($p<0.001$) and more hip flexion ($p<0.001$) than patients with normal spines. There was no difference in sitting pelvic tilt or sitting acetabular component position among patient groups.

Conclusion: This study shows patients with fixed spinopelvic alignment from standing to sitting position are at higher risk of hip dislocation. We did not find a sitting "safe zone" for acetabular component position for low risk of dislocation. Imaging patients from standing to sitting position in a consistent fashion can provide valuable information on whether a patient has fixed spinopelvic alignment with postural changes and is therefore at higher risk of dislocation.

Notes