Prevalence of adverse spinopelvic characteristics in patients undergoing total hip arthroplasty and its clinical implications – A prospective study

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INTRODUCTION:
Adverse spinopelvic characteristics (ASC) are associated with increased dislocation risk following primary total hip arthroplasty (THA). How often such patients are presenting to clinic and whether surgical approach influences dislocation-risk is unknown. This study aims to 1: Describe prevalence of patients presenting for a THA with adverse spinopelvic characteristics; 2. Test for association with pre-THA functional scores; and 3. Describe early-term dislocation rate with different approaches.
METHODS:
This is a prospective, three-center, multi-surgeon, consecutive, cohort series of 460 patients (mean age: 65.8±11.8y; 52.5% females; mean BMI: 28.1±5.5kg/m^2) undergoing THA through anterolateral- (n=202; 44%), direct anterior- (n=216; 47%) or posterior- approaches (n=142; 22.8%) without dual-mobility bearings or robotics. All participants underwent spinopelvic radiographs in standing and deep-flexed-seated positions to determine spinopelvic characteristics. ASC were Pelvic tilt >19°; spinopelvic imbalance (PI-LL >10°); and spinal stiffness (lumbar flexion <20°). Pre-operative patient reported outcomes was measured using Oxford Hip Score (OHS). Dislocation rates were prospectively recorded at follow-up of 1.5±0.9 years.
RESULTS:
Presence of any ASC was seen in 41%. Most common characteristic was high pelvic-tilt (34%), followed by spinopelvic imbalance (22%) and spine stiffness (6%). Only 3% had all three characteristics. 1% has all 3 ASC characteristics (n=11). There was no difference in the pre-operative OHS between patients without or with ASC (20.2±9.4 vs. 18.1±7.5; p=0.370). At 1-year, two patients sustained a dislocation (0.4%), both with all three ASC characteristics that had posterior approach. Amongst patients with ASC, anterior- and anterolateral approaches were associated with reduced dislocation risk (p=0.03).
DISCUSSION AND CONCLUSION:
The prevalence of any ASC, especially high pelvic-tilt, is high. However, the presence of all three ASCs is low (3%). Use of the anterior- and anterio-lateral approaches in such patients minimizes dislocation risk. However, patients with ASCs, especially all three, treated with posterior approach may benefit from advanced technology to minimize dislocation-risk.