## Changes Of Spino-Pelvic Characteristics post-THA are Independent of Surgical Approach & ndash; A prospective Study

Moritz Michael Wagner, Jeroen Verhaegen, Camille Vorimore, Moritz Innmann<sup>1</sup>, George A Grammatopoulos<sup>2</sup> <sup>1</sup>Heidelberg University Hospital, <sup>2</sup>The Ottawa Hospital

## INTRODUCTION:

Spino-pelvic characteristics are associated with biomechanical THA behavior. Spinopelvic characteristics change posttotal hip arthroplasty (THA). Whether this change varies between approaches, with different capsular releases, is of interest for pre-op cup orientation planning. This study reports changes in spino-pelvic characteristics pre- and post- THA and compares these changes seen amongst most commonly utilized THA approaches. METHODS:

This is a prospective, two-center, study. All THAs, under the care of 10 surgeons, that agreed to participate between 2020-2023 were reviewed (n=612). To reduce bias, patients, as per approach, were matched for age and gender resulting in study sample of 424 patients (age:  $65(\pm 10)$  years-old; BMI:28( $\pm 5$ ). 171(40%) had anterior-, 181(43%) lateral- and 72(17%) posterior- approach). Spinopelvic characteristics were determined from Lateral radiographs (pre- and one-year post- THA). Parameters of interest included: Lumbar lordosis, sacral slope, pelvic incidence, pelvic tilt and pelvic-femoral angle. A difference greater than 7° in pelvic tilt (PT) resulting in greater than 5° change in acetabular version was considered significant.

## **RESULTS**:

Post-THA, the mean change in PT was  $2^{\circ}\pm10.23\%$  of cases (n=98) demonstrated significant PT change (increase: 81, reduced: 17). Those with a significant increase in PT had fixed-flexion contractures (lower pre-THA pelvic tilt (11° vs 19°) and pelvic-femoral angle (181° vs 189°) pre-THA (p<0.001). Small, non-clinically significant, approach-related differences were seen, with the lateral approach illustrating the greatest increase in PT [lateral (2.9° ± 6.2°) vs anterior (1.1° ± 6.1°) vs posterior (1.6° ± 6.8°); p=0.03]. There was no difference in prevalence of significant PT change between approaches (p=0.43).

## DISCUSSION AND CONCLUSION:

Spinopelvic changes post-THA are independent on surgical approach and type of capsulotomy (anterior vs posterior). Degree of fixed-flexion contracture was the only parameter correlated with the post-THA changes in spinopelvic characteristics. No approach-specific prediction of change needs to be considered during pre-THA planning.