

Dr. George Grammatopoulos

"The Hip- Spine Interaction in Hip Arthroplasty: Defining its Importance and Identifying How Best to Incorporate it into Surgical Practice"

Each year, over 60,000 Canadians undergo Total Hip Arthroplasty (THA), a procedure that significantly enhances mobility and quality of life for patients with hip degeneration. However, complications such as instability, pain, and wear can undermine success. A critical factor influencing outcomes is the orientation of the acetabular cup, which influences impingement risk and overall hip stability. Recent research emphasizes the interplay between the hip and spine, showing that postural changes and pelvic alignment significantly impact cup orientation. This relationship is particularly crucial in patients with spinal conditions, such as degenerative spine disease and spinal fusion. These patients experience worse outcomes due to the increased demand on the hip joint for daily function.

The study of spinopelvic characteristics with lateral spinopelvic radiographs can provide information on one's posture and dependency on the hip for activities of daily living. Parameters easily obtained from radiographs can help clinicians identify patients at-risk (of dislocation or poor outcomes) and plan for surgery. Key metrics, such as the Combined Sagittal Index (CSI), provide valuable preoperative insights, linking patient-specific anatomy with optimal surgical targets. This parameter can be obtained from a single radiograph and thus is associated with reduced radiation exposure and cost if taking multiple radiographs, whilst enhancing the precision of surgical planning.

Future directions should focus on refining surgical approaches to accommodate adverse spinopelvic characteristics, understanding the impact of surgical techniques on instability risk, and identifying ideal sagittal reconstructions for improved patient outcomes. Additionally, ongoing studies aim to assess the accuracy with which surgeons can achieve desired targets using advanced technologies such as navigation and robotics. By integrating patient-specific spinopelvic data into planning and execution, this body of work aims to elevate THA outcomes and improve long-term patient satisfaction.