

Impact of Offset and Leg Length on Functional Outcomes Post-Total Hip Arthroplasty – How Accurate Should it Be?

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INTRODUCTION:

Accurate hip reconstruction is associated with improved biomechanical behavior following total hip arthroplasty (THA). However, whether this is associated with improved Patient-Reported-Outcome measures (PROs) is unknown. This study aims to: 1) Assess whether restoration of global offset (GO) and leg-length (LL) is associated with improved PROs; 2) Investigate whether increase of femoral offset (FO) to compensate for acetabular offset (AO) reduction affects outcome.

METHODS:

This is a two-center, multi-surgeon, prospective, consecutive, cohort study. A total of 425 patients that underwent primary THA were included (53% females; age:65±12; BMI:28±6). All surgeries were performed without robotics or navigation. Most underwent lateral (52%), followed by anterior (35%) and posterior (13%) approach. PROs were obtained using Oxford-Hip-Score (OHS) pre- and at 1-year. Supine AP pelvic radiographs at 1-year, were analyzed using a validated software to determine AO, FO, GO and LL, relative to the contralateral side. Accuracy of reconstruction and effect on OHS was tested at 2.5mm increments.

RESULTS:

GO difference between sides was 0.7±7mm, while LL difference was 1±7mm. Mean ΔOHS increased by 22±11. Reconstruction within ±2.5mm/ ±5mm/ ±7.5mm and >7.5mm for both GO/LL were seen in 12%, 32%, 63%, and 8% respectively. Best ΔOHS (26±10) was detected with GO/ LL within ±2.5mm (p=0.006). ΔOHS within 5mm (24±11) and within 7.5mm (23±11) were superior to reconstructions >7.5mm (20±12) (p=0.037). When GO/LL was within ±5mm, ΔOHS was superior when both AO and FO were within ±5mm (25±10) compared to when FO was above 5mm to compensate for reduction in AO (21±12, p=0.042).

DISCUSSION AND CONCLUSION:

Functional outcomes are associated with biomechanical reconstruction. The closer the reconstruction to the native hip, the better the outcome. Best scores were seen with reconstructions of within 2.5mm. However, the ability of obtaining this without advanced technology is reduced. Maintenance of AO is important as compensation by increase FO is associated with negative effect on outcome.