Patient-Reported Outcome Measures in Conventional Total Hip Arthroplasty Versus Robotic-Arm Assisted Arthroplasty: A Prospective Cohort Study with Minimum Three Years Follow Up

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INTRODUCTION:
Robotic-arm assisted total hip arthroplasty (RO THA) has been shown to improve the accuracy of component positioning compared with conventional total hip arthroplasty (CO THA), but it remains unknown how this translates to any differences in patient-reported outcome measures (PROMS) between these two groups. This study reports the clinical outcomes of a previous trial that showed RO THA was associated with improved accuracy and reduced outliers in acetabular component positioning compared with CO THA.
METHODS:
This prospective cohort study included 50 patients undergoing CO THA versus 50 patients receiving RO THA. All surgical procedures were performed by a single surgeon using the posterior approach with identical implant designs and standardized postoperative rehabilitation programs. Predefined outcomes including the Oxford hip score (OHS), Forgotten joint score (FJS), and University of California at Los Angeles hip (UCLA) score, and any associated complications were recorded annually for three years following surgery. Patients in both treatment groups were comparable for age, gender, body mass index, laterality of surgery, and ASA scores.
RESULTS:
At three years follow up, there was no statistically significant difference in CO THA versus RO THA with respect to the OHS (41.7 ± 5.4 vs. 42.3 ± 4.9, p=0.478), FJS (84.7 ± 9.1 vs. 89.2 ± 7.8, p=0.063), and UCLA score (7.6 ± 1.4 vs. 7.9 ± 1.9, p=0.243). None of the study patients had dislocations or underwent revision surgery within three years follow up. Spearman's rank correlation coefficient showed no statistical correlation between accuracy of achieving the planned cup inclination and version with the OHS, FJS, or UCLA score.
DISCUSSION AND CONCLUSION:
Improved accuracy of acetabular component positioning in RO THA in a high-volume setting does not appear to significantly improve short-term functional outcomes or risk of complications compared to CO THA. Further studies are needed to assess the significance of these findings on longer term clinical outcomes and implant survivorship, and also to explore the impact of the enhanced RO THA workflow and functional positioning for both acetabular and femoral component placement on these outcomes.