Dislocation Rates Between Manual and Robotic-Assisted Total Hip Arthroplasty Utilizing the Posterolateral Approach

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INTRODUCTION:

Dislocation following total hip arthroplasty (THA) is a common complication. While the posterolateral (PL) approach is the most commonly used approach to the hip, the disruption of posterior soft-tissue is a major concern for implant stability. The introduction of robotic assistance in arthroplasty has demonstrated improved implant positioning, although the effect on outcomes is still being assessed. The primary purpose of our study is to assess the 90-day dislocation rate between robotic-assisted and manual primary THA through the posterolateral approach.

METHODS: Data was collected from two board certified adult reconstruction surgeons who perform THA through a posterolateral approach from 2014-2023. These two surgeons have high-volume arthroplasty practices and transitioned from manual to robotic-assisted surgery within this time-period. Variables including patient demographic information, use of robotic-assistance, total 90-day complications, and Hip Disability and Osteoarthritis Outcome Score (HOOS) were collected and analyzed. Statistical analysis for numerical values was conducted via a Student's t-test and categorical variables with Chi-Square analysis, with alpha set at 0.05.

RESULTS:

2,548 patients underwent a THA through the posterolateral approach at our institution from 2014-2023. 1,727 patients had a manual THA and 821 patients had a robotic-assisted THA. There was no significant difference in total complication rates (n=59, 3.4% vs n=18, 2.2%, p=0.092) or dislocation rates (n=7, 0.4% vs n=3, 0.4%, p=0.88) between the manual and robotic-assisted groups, respectively. There was no statistical difference in HOOS at any of the post-operative timepoints between cohorts. Total operative time was significantly longer for the robotic assisted group (88 minutes) compared to the manual group (74 minutes).

DISCUSSION AND CONCLUSION: This study demonstrated no significant difference in 90-day dislocation rates for high-volume arthroplasty trained surgeons when comparing manual vs robotic-assisted total hip arthroplasty. Robotic-assisted surgery was not associated with increased complication rates. Long term studies may be necessary to determine if potential long-term benefits of more accurate component position utilizing robotic assistance lead to improved outcomes.