

## **Postoperative Complications and Readmission Rates in Robotic-Assisted and Manual Total Hip Arthroplasty: A Large, Multi-Hospital Study**

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**INTRODUCTION:** The impact of robotic-assisted platforms on postoperative readmission and complication rates following total hip arthroplasty (THA) remains unclear. This study aims to compare 90-day postoperative complications, readmissions, and emergency department (ED) rates between robotic-assisted THA (RA-THA) and manual THA (M-THA).

**METHODS:** A retrospective review of a multi-hospital database identified primary THA patients between January 2016 and December 2021. Surgeons from 73 hospitals who performed both RA-THA and M-THA techniques were included. The cohorts were 1-to-1 matched based on patient gender, age, and body mass index (BMI) resulting in 8,033 patients in each cohort (N=16,066). The 90-day readmission, readmission with >23 hours observation, and ED visit rates were compared between cohorts. Complications reported during readmission were classified according to the Clinical Classification Software schema, using ICD-10 codes, and compared between cohorts. Cohorts were statistically compared using Mann-Whitney U and Chi-squared tests.

### **RESULTS:**

Baseline cohort characteristics were similar between cohorts. Overall 90-day readmission rates were significantly lower with RA-THA (2.8%) compared to M-THA (3.4%,  $p=0.03$ ). RA-THA had lower rates of readmissions with >23 hours observation (RA-THA: 2.1%; M-THA: 3.0%,  $p<0.001$ ). For readmissions with >23 hours observation, RA-THA patients had fewer dislocations (RA-THA:0.09%; M-THA:0.39%,  $p<0.001$ ), surgical site infections (SSI) (RA-THA: 0.04%; M-THA: 0.20%,  $p=0.004$ ), and wound infections/cellulitis (RA-THA: 0.01%; M-THA: 0.11%,  $p=0.021$ ). Overall ED visit rates were not significantly different between cohorts (RA-THA: 5.9%; M-THA: 6.1%,  $p=0.60$ ). For ED visits, the only difference between cohorts was dyspnea without pulmonary embolism (RA-THA: 0.20%; M-THA: 0.06%,  $p=0.03$ ).

**DISCUSSION AND CONCLUSION:** RA-THA showed significantly lower rates of readmission with >23 hours observation, most notably for readmissions due to dislocation and SSI/wound infection, and lower overall 90-day readmission rates. There was no significant difference in overall ED visit rates between cohorts. Of note, RA-THA patients had significantly more ED visits due to dyspnea without pulmonary embolism.