Comparison of Clinical and Patient-Reported Outcomes Following Total Hip Arthroplasty at Academic and Non-Academic Medical Centers

Alexander Hoffman, Caroline Lindsey, Logan Finger, Andrew Frear, Noah Feder, Kenneth Urish, Michael O'Malley, Brian A Klatt[1], Johannes F Plate
[1]University of Pittsburgh/Upmc

INTRODUCTION: Total knee arthroplasty (THA) within the authors' large regional health system is performed at academic and non-academic community hospitals. Historically, patients at academic medical centers were thought to have higher comorbidities with the potential of higher complication rates and decreased patient reported outcome scores (PROs). Therefore, this study aims to compare rates of various postoperative complications after THA between academic and community hospitals to improve surgical outcomes and healthcare equity.
METHODS: This retrospective cohort study analyzed postoperative complication rates following THA in academic versus community hospitals from March 2016 to April 2024. Data on patient demographics (e.g. age, sex, race, ethnicity, BMI, Elixhauser Comorbidity Score) and postoperative outcomes (e.g. infection, pneumonia, acute myocardial infarction, pulmonary embolism, surgical site bleeding, mortality, revision surgery, sepsis) were collected from 18 institutions. Chi-square tests were used to compare rates between academic and community patient groups. An academic facility was defined as a designated teaching hospital with 24/7 service-line coverage by orthopaedic residents and consistent resident participation in surgery.
RESULTS:
A total of 17,489 patients underwent THA at 18 hospitals. 12,020 cases (68.7%) were performed at 7 academic hospitals and 5,469 (31.3%) were performed at 11 eleven community hospitals. The patients at non-academic centers, were older (66.3 ± 10.9 vs 65.1 ± 11.1 years, p-value <0.01) and had higher Elixhauser scores (2.12 ± 1.63 vs 1.90 ± 1.59, p-value <0.01), while patients at academic centers were more likely to be female (55.5% vs 52.9%, p-value <0.01). The average BMI of patients at each center did not differ (33.6 ± 7.4 vs 33.7 ± 7.2, p-value= 0.75). Hip Disability and Osteoarthritis Outcome Score (HOOS) preoperative scores were similar (p-value= 0.08), however patients at non-academic centers had lower mean Patient-Reported Outcome Measurement Information System (PROMIS) 10 Mental pre-scores by 0.89 ± 0.13 points (p-value <0.01), but higher PROMIS 10 Physical Pre-Scores by 0.81±0.16 points (p-value <0.01).

Average Elixhauser scores differed significantly across groups for the following years: 2017 (Academic: 2.31 vs Non-academic: 2.10, p-value= 0.04), 2018 (2.24 vs 1.99, p-value <0.01), 2019 (2.25 vs 2.01, p-value <0.01), 2020 (2.16 vs 1.90, p-value <0.01), 2021 (2.04 vs 1.82, p-value <0.01) and 2023 (2.11 vs 1.85, p-value <0.01). The scores did not differ between groups in 2022 (1.78 vs 1.74, p-value= 0.58) and 2024 (1.85 vs 1.64, p-value= 0.22)

Analysis revealed that patients who received a primary THA at non-academic centers had less of a risk of requiring a revision surgery than those at academic centers (9.24% vs 17.6%, p-value= <0.01). However, there was no difference in the rate of revisions performed due to infection between the two groups (0.25% vs 0.13%, p-value= 0.11). Patients at academic and non-academic centers had similar odds of experiencing any complication (OR: 0.93 non-academic:academic, 95% CI: 0.75-1.15), acute myocardial infection (OR: 0.44, 0.02-3.03), death (OR: 0.96, 0.38-2.27), mechanical failure (OR: 0.90, 0.68-1.19), pulmonary embolism (OR: 0.81, 0.35-1.75), pneumonia (OR: 1.62, 0.65-3.96), sepsis (OR:1.06, 0.35-2.90), wound infection (OR: 0.76, 0.49-2.28), surgical site infection (OR: 1.02, 0.64-1.57), in-house mortality (OR: 0.36, 0.02-2.25), 30-day mortality (OR: 1.25, 0.44-3.41), 1-year mortality (OR: 1.22, 0.85-1.74), 90-day readmission (OR: 0.93, 0.81-1.08), length of stay (p-value= 0.87), absolute HOOS 1-year score (p-value= 0.06) or HOOS change at 1 year (p-value= 0.56). However, patients at non-academics were more likely to have higher PROMIS 10 Mental scores at 1 year by 0.84±0.28 points (p-value <0.01) and higher PROMIS 10 Physical scores at 1 year by 0.60±0.29 points (p-value= 0.04).

DISCUSSION AND CONCLUSION: When controlling for sex, BMI, age, and Elixhauser score, patients at academic centers, on average, are more likely to have greater PROMIS 10 Mental and Physical scores at 1 year. Additionally, patients at non-academic centers were less likely to undergo revision surgery though revision due to infection was roughly the same at both types of center. Therefore, despite patients at non-academic centers having higher BMI and comorbidities they tend to have similar, if not better, outcomes than their counterparts treated at academic centers. This may indicate that there are other patient-related factors, beyond those controlled for in this study, that lead those treated at academic facilities to have inferior outcomes.