Early Revisions after Robotic-Assisted versus Conventional Total Knee Arthroplasty

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INTRODUCTION:
Adoption of robotic-assisted total knee arthroplasty (ra-TKA) continues to grow despite limited evidence for improved patient satisfaction or implant survival. The purpose of this study was to determine if ra-TKA compared with conventional total knee arthroplasty (c-TKA) results in decreased odds of revision surgery within 2-years of the index procedure.
METHODS:
The American Joint Replacement Registry and its linkage to Medicare claims data was used to create a retrospective cohort comparison of patients aged 65 years or older who underwent ra-TKA (n=14,126) or c-TKA (n=128,334) between January 2017 and March 2020 allowing for minimum 2-year follow up. Controlling for age, gender, BMI, race, Charlson comorbidity index, anesthesia type, and year of index procedure, a multivariable, mixed-effects logistic regression model was created to analyze the odds of all-cause revision as a factor of robotic-assistance utilization, and a logistic regression model was created to investigate specific revision diagnoses.
RESULTS: After controlling for potentially confounding variables, the odds of revision at 2 years did not differ between patients undergoing ra-TKA compared with c-TKA (odds ratio of ra-TKA versus c-TKA: 1.0 [95% CI, 0.8 to 1.3]; p = 0.92). Reason for revision of ra-TKA was similar to c-TKA with the exception of increased odds of instability OR 1.6 [95% CI 1.0 to 2.4]; p = 0.04) and pain OR 2.1 [95% CI 1.4 to 3.0]; p = 0.002) in the ra-TKA cohort.
DISCUSSION AND CONCLUSION:
At minimum 2-year follow up, ra-TKA does not show an improvement over c-TKA in overall risk of revision and is associated with increased odds of revision for instability and pain in comparison to c-TKA. In light of these findings, surgeons should not assume that ra-TKA will lead to improved early implant survival.