

Is Robotically-Assisted Total Knee Arthroplasty Associated with Improved Early Recovery? A Prospective Cohort Study Utilizing Daily Remote Monitoring

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INTRODUCTION: The purpose of this study was to compare the early clinical outcomes between robotically-assisted (RA-TKA) and manual total knee arthroplasty (M-TKA) utilizing daily remote patient monitoring.

METHODS:

We prospectively enrolled 94 RA-TKAs between 2021 –2022 and compared them to a consecutive series of 114 M-TKAs prospectively enrolled between 2020 –2021 in a prior study with the same protocol. All patients utilized a wrist-based activity monitor and a smartphone app-based patient engagement platform for one week preoperatively and 90 days postoperatively to collect daily step counts, Visual Analog Scale (VAS) pain scores, opioid consumption (milligram morphine equivalent;[MME]), weekly Oxford Knee Score (OKS), and monthly Forgotten Joint Score (FJS). There were no differences between groups in sex or BMI. The robotic group was younger (mean age 63 vs. 65, $p=0.06$). Independent sample t-tests were used for continuous data and Chi-squared and Fisher's exact tests were used for discrete data. Linear mixed models were used for longitudinal analysis of patient outcomes over the study period.

RESULTS: RA-TKA led to decreased pain (mean VAS 3.6 vs. 4.2; $p=0.01$) and reduced opioid consumption in the first 7 days postoperatively (mean 10 less MME per day; $p<0.001$) compared to M-TKA. RA-TKA patients stopped opioids on average 6 days sooner (mean 24 vs. 30 days; $p=0.04$). There were no differences in days to stopping gait aids (mean 31 vs. 35 days; $p=0.09$). RA-TKA led to improved OKS scores for the first 5 weeks postoperatively ($p=0.01$). There were no differences in FJS scores at all time points or OKS scores beyond 5 weeks. There were no differences in length of surgery ($p=0.4$), step count ($p=0.64$), complications ($p=0.2$), or readmissions ($p=0.5$) between groups.

DISCUSSION AND CONCLUSION: Utilizing daily remote patient monitoring, we found that robotic-assistance in TKA led to incremental improvements in pain, opioid consumption, and OKS scores compared to manual instrumentation in the early recovery after primary TKA.