

# **No Difference in Functional Outcomes between Robotic-Assisted and Conventional Total Knee Arthroplasty: Results of a Prospective, Double-Blind, Randomized, Controlled Trial**

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**INTRODUCTION:** Optimizing soft tissue balancing and alignment in total knee arthroplasty (TKA) may improve patient-reported outcomes and survivorship. Robotic-assisted TKA (raTKA) may allow for more reproducible balancing and implant positioning. However, few randomized controlled trials (RCTs) have directly compared modern raTKA to conventional TKA (cTKA). The purpose of this study was to compare early functional outcomes of raTKA and cTKA

## **METHODS:**

In this double-blind RCT, 60 patients were randomized to raTKA or cTKA without the use of any technology. All care was otherwise standardized. The primary outcome measures were the timed-up-and-go (TUG) and stair climbing test (SCT) collected by a blinded observer preoperatively, one and six months postoperatively. Secondary outcome measures were KOOS, EQ-5D, VAS scores, opioid use, complications, radiographic measurements, and operative time. Standard bivariate statistical analysis was conducted.

**RESULTS:** There was no difference in preoperative demographics and both cohorts demonstrated functional outcome improvement at six months. There was no difference in one-month TUG between raTKA and cTKA (13.9 vs. 14.1s;  $p=0.26$ ) or SCT (24.4 vs. 25.6s;  $p=0.8$ ) and six-month TUG (11 vs. 10.8s;  $p=0.89$ ) and SCT (17.3 vs. 15.5s;  $p=0.8$ ). The raTKA group demonstrated improved KOOS pain (65.4 vs. 55.9;  $p=0.01$ ) and symptoms (67.7 vs. 60.3;  $p=0.03$ ) at one month only. Operative time was longer in the raTKA group (78.4 vs. 68.8 min;  $p<0.001$ ). The mean hip-knee-ankle angle was  $178^\circ$  for both groups, and there was one outlier (alignment  $>4^\circ$  of neutral mechanical axis) in each group. There were no other differences in any other outcomes.

**DISCUSSION AND CONCLUSION:** This RCT comparing raTKA to cTKA found no significant difference in functional outcome scores. KOOS pain and symptom scores were better for raTKA at one month, but operative time was 10 minutes longer. This study demonstrates that raTKA and cTKA provide comparable functional, radiographic, and patient-reported outcomes at six months.