

Improved Short-Term Outcomes in Robotic-Assisted Revision Total Knee Arthroplasty

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INTRODUCTION:

Robotic-assisted revision total knee arthroplasty (RATKR) has recently been described. This study compares short-term outcomes of RATKR to conventional revision total knee arthroplasty (TKR). We hypothesize that RATKR will accelerate return of function, measured in range of motion and time to ambulation.

METHODS:

This is a retrospective case-control study reviewing consecutive revision total knee arthroplasty (TKA) performed by a single surgeon between 2017-2024. Consecutive TKR cases performed prior to 2022 were compared to RATKR performed from 2022 through present day. Revisions for periprosthetic joint infection or fracture were excluded. Data collected included demographics, surgical and implant data, in-hospital physical therapy (PT) progress, and outcomes through a minimum of 2-years.

RESULTS:

66 revision TKA cases (42 TKR and 24 RATKR) were included with average age 67.7 years. Etiologies included loosening (42), second-stage reimplantation (12) after infection eradication, polyethylene wear (6), instability (6), and other etiologies (6). RATKR case time averaged 27 minutes less than conventional, $p=0.18$. The RATKR cohort ambulated further on POD1 compared to the TKR group (166.3 versus 87.2 feet, $p=0.01$), was cleared by physical therapy for discharge sooner (2.1 versus 3.1 days, $p<0.01$), and had a shorter hospital length of stay (2.5 versus 3.6 days, $p=0.01$). While all patients in both cohorts achieved at least 110° knee flexion by 6-weeks, RATKR patients demonstrated significantly more knee flexion (119° versus 110°, $p=0.05$). At minimum 2-year follow-up, no RATKR patients required re-revisions, compared to 2 TKR patients.

DISCUSSION AND CONCLUSION:

Revision TKA can be successfully performed via conventional and robotic techniques. In this study, RATKR showed improved ability to ambulate after surgery with decreased hospital length of stay, more overall knee range of motion. Long term outcomes are needed to evaluate additional benefits that may be realized with RATKR techniques.