Conversion of Failed Unicompartmental Knee Arthroplasty to Total Knee Arthroplasty Using Robotic-Assisted Technology

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INTRODUCTION:

Conversion of failed unicompartmental knee arthroplasty (UKA) to total knee arthroplasty (TKA) can be technically challenging to restore joint line and obtain well-balanced soft tissue gaps. Robotic-assisted TKA (RA-TKA) was introduced to achieve accurate alignment and well-balanced soft tissue gaps. The purpose of this study was to compare results of conversion of failed unicompartmental arthroplasty to TKA using RA-TKA versus conversion to TKA using manual instruments.

METHODS:

This is a retrospective study of 39 consecutive UKAs converted to TKA using RA-TKA compared with 65 UKAs converted to TKA using jig-based instruments. Three patients in the RA-TKA group and 8 patients in the manual group were lost-to-follow-up leaving 36 and 57 UKAs converted to TKA with minimum 1-year follow-up, respectively. There were no differences in age and BMI between groups. Mean follow-up was 25.1 months (range 12-48) in the RA-TKA group and 90.3 months (range 24.8-197.2) in the manual group. Clinical outcomes, complications, and patient-reported outcome measures (PROMs) were reviewed.

RESULTS:

In the RA-TKA group, 15 (41.67%) knees received a primary tibial baseplate compared to 19 (33.33%) in the manual group (p=0.42). In the RA-TKA group, there were 10 (25.6%) cases requiring the use of augments compared to 23 (40.4%) in the manual group (p=0.25). There was 1 revision in the RA-TKA group (2.8%) due to instability and 6 (10.5%) revisions in the manual group. There was no difference in KOOS JR, FJS, PROMIS 10 physical, satisfaction, or postoperative range of motion between the two groups. Survivorship with all-cause failure as the endpoint was 96.7% for the RA-TKA group and 98.2% for the manual group at 2 years.

DISCUSSION AND CONCLUSION:

Robotic-assisted TKA demonstrated noninferiority compared to manual TKA for conversion of failed UKA to TKA. Longer follow-up is needed to determine if robotic-assisted TKA can demonstrate improved survivorship over manual TKA.
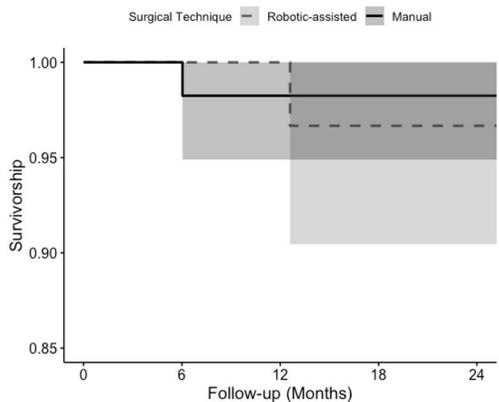

Figure 1. Kaplan-Meier survivorship curve with a 95% confidence interval demonstrating all-cause survivorship of 96.7% and 98.2% for robotic-assisted and manual TKA at 2 years, respectively.