

Improved accuracy of component positioning with robotic-assisted unicompartmental knee arthroplasty: data from a prospective, randomized controlled study

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Goal of study:

To evaluate the accuracy of component positioning to plan for unicompartmental knee arthroplasty (UKA) comparing robotic-arm assisted and conventional surgical techniques

Materials and methods:

- Prospective, single-center, level I, blinded, randomized controlled trial
- Patients were randomly assigned treatment with either a robotic-arm assisted Mako Partial Knee or a manual surgical procedure using a Biomet Oxford
- Post-operative CT scan was performed at three months to assess the accuracy of the planned vs. achieved component positioning in the axial, coronal, and sagittal planes
- Fisher exact test and chi-square test were used to compare categorical data for 120 patients

Results:

- Mako Partial Knee showed more accurate component positioning to plan with lower root mean square (RMS) errors and significantly lower median errors in all six component parameters ($p < 0.01$)
- The proportion of patients with component implantation within 2° of target position was greater in Mako Partial Knee compared to the manual cohort with significance in 5/6 parameters ($p < 0.05$) (See Figure 1)

Conclusion:

- UKA with Mako Partial Knee led to improved accuracy of component positioning to plan compared with conventional surgical techniques

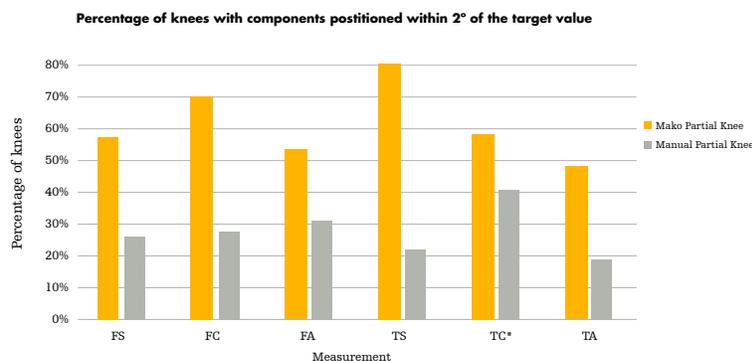


Figure 1: Comparison of surgical procedures showing greater percentage of Mako Partial Knees within 2° of planned target value. FS= Femoral Sagittal, FC= Femoral Coronal, FA= Femoral Axial, TS= Tibial Sagittal, TC*= Tibial Coronal, TA= Tibial Axial. * = non-significant parameter

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