

Results of Revision Total Knee Arthroplasty Using Robotic Assisted Technology: a Preliminary Review

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INTRODUCTION:

Robotic-assisted total knee arthroplasty (RA-TKA) has been introduced to help achieve the target alignment and accurate, well-balanced gaps. The purpose of this study was to determine the feasibility and preliminary clinical outcome of revision TKA using robotic-assisted technology (rRA-TKA).

METHODS:

This is a retrospective study evaluating feasibility and results of revision TKA using rRA-TKA. There were 20 rRA-TKA patients matched with 20 revision TKAs using manual instrumentation. Both rRA-TKA and manual revision TKA groups included 11 males and 9 females. There were no differences in age and BMI between the groups. The minimum follow-up was 1 year in both groups. Neutral mechanical alignment was used in manual group whereas functional alignment was used in the rRA-TKA cohort by establishing the tibial cut first followed by tensioning and balancing the soft tissues through manipulation of the femoral component. There were no differences in preoperative ROM, KOOS JR, or Forgotten Joint Score (FJS). In the rRA-TKA group, indications for revision included: 14 instability, 3 aseptic loosening, 2 stiffness, and 1 for malalignment and patellar subluxation. In the manual group, all 20 indications were for instability. Clinical outcomes, complications, and patient-reported outcome measures (PROMs) were reviewed.

RESULTS:

Mean postoperative flexion in the rRA-TKA group was 120.63 versus 116.67 the manual group ($p=0.001$). Postoperative PROMs were higher in the rRA-TKA group vs the manual group: FJS 60.1 vs 31.9 ($p=0.009$), KOOS JR 72.2 vs 54.3 ($p=.061$), PROMIS-10 Physical 50.1 vs 36.2 ($p=.02$), PROMIS-10 Mental 46.3 vs 43.5 ($p=.696$). There was no difference in postop complications between groups.

DISCUSSION AND CONCLUSION:

Robotic-assisted revision TKA demonstrated improved ROM and postoperative PROMs compared to manual revision TKA. Use of RA-TKA in revision surgery appears promising. Additional work is needed to determine the role of alignment, neutral mechanical versus functional, given the improved outcomes of the rRA-TKA cohort.