

Accuracy of intraoperative robotic-arm assisted total knee replacement coronal alignment with standing long leg postoperative alignment

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Objective

- Robotic-arm assisted total knee arthroplasty (RATKA) was introduced in July 2016.
- RATKA allows surgeons to define the alignment of the lower limb while dynamically adjusting implant position and bony cuts.
- The purpose of this study was to determine intraoperative mechanical alignment accuracy as compared with six week postoperative standing long leg x-rays.

Methods

- Retrospective review of 154 consecutive RATKA
- 76 male, 78 female
- 74 left, 80 right
- Mean age of 68.6 ± 6.3 years
- Intraoperative mechanical alignment was determined with preoperative CT scan guided navigational software.
- Dynamic graphic user interface postoperative mechanical alignment was determined with standing long leg x-ray at the six week follow up interval.
- Mechanical axis was determined from these images by drawing a straight line from the center of the femoral head to the intercondylar notch of the distal femur to the center of the ankle.
- Statistical analysis was primarily descriptive.



Results

- Mean intraoperative mechanical alignment of $1.6^\circ \pm 1.2^\circ$
 - Left: $1.6^\circ \pm 1.2^\circ$, Right: $1.7^\circ \pm 1.3^\circ$
- Mean six week postoperative mechanical alignment of $1.5^\circ \pm 1.3^\circ$
 - Left: $1.5^\circ \pm 1.3^\circ$, Right: $1.5^\circ \pm 1.2^\circ$
- Mean change of intraoperative to postoperative alignment of 0.1°
 - Left: 0.1° , Right: 0.2°

Conclusion

- RATKA has a high degree of intraoperative alignment accuracy when compared to postoperative alignment.
- Knee laterality, pre-operative angular deformity of the index procedure did not affect alignment accuracy.
- Further studies are necessary to assess the effects of alignment accuracy to postoperative patient reported outcome measures in RATKAs.

Reference:
 Roche, M., Vakharia, R., Law, T., Wang, K., Nevelos, J. Accuracy of intraoperative robotic-arm assisted total knee replacement coronal alignment with standing long leg postoperative alignment. ISTA 31st Annual Congress, London, UK. October 10-13, 2018

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