+ Evidence in focus
Publication summary

Smith+Nephew

Robotic-assisted total knee arthroplasty (TKA) with JOURNEY◊ II TKA improves accuracy, limb alignment, soft tissue balance and early patient reported outcome measures (PROMs), compared with conventional TKA with the same implant

Matsumoto T, Nakano N, Hayashi S, et al. Prosthetic orientation, limb alignment, and soft tissue balance with bi-cruciate stabilized total knee arthroplasty: a comparison between the handheld robot and conventional techniques. *Int Orthop*. 2023;47(6):1473–1480

Available at: Int Orthop

Key points

Smith+Nephew robotic-assisted (RA) TKA, compared with conventional TKA, using JOURNEY II TKA demonstrated:

- **Improved soft tissue balance** throughout the range of motion (ROM)
- **Significantly improved accuracy** in implant placement and limb alignment ($p<0.05$)
- **Significantly improved** Knee Society Score (KSS) at 1-year post-TKA ($p<0.05$)

Overview

- Retrospective analysis of 70 patients, comparing RA TKA using NAVIO◊ Surgical System (n=35) with conventional TKA (n=35)
- RA TKA and conventional TKA patients were matched on mean age (74.6 vs 74.7 years, respectively), mean body mass index (25.3 vs 26.5kg/m^2, respectively) and other variables, including sex, osteoarthritis diagnosis and pre-TKA varus deformity and ROM
- All surgeries were performed by the same surgeon and used JOURNEY II BCS TKA
- Soft tissue balance throughout the ROM was assessed intra-operatively with an offset-type tensor
- Component alignment and implant positioning accuracy were assessed by pre- and post-operative calibrated, weight-bearing radiographs of:
  - Hip-knee-ankle (HKA) angle
  - Femoral component alignment (FCA)
  - Tibial component alignment (TCA)
- ROM and 2011 KSS were assessed at 1-year post-TKA

Results

- Compared with the conventional TKA group, the RA TKA group demonstrated improved soft tissue balance throughout the ROM:
  - Significantly smaller joint component gaps throughout the ROM ($p<0.05$; Figure)
  - Significantly improved varus/valgus balances in flexion angle ≥120° ($p<0.05$; Figure)
- The RA TKA group demonstrated significantly improved implant alignment with more accurate (±2° varus/valgus) HKA angle ($p<0.0001$) and FCA ($p=0.002$), and a reduction in HKA and FCA outliers, compared with the conventional TKA group. TCA was similar in both groups
- Both groups demonstrated similar ROM at 1-year post-TKA
- The RA TKA group demonstrated significantly improved KSS on objective knee indicators ($p=0.013$), patient satisfaction ($p=0.009$) and functional activities ($p=0.002$) compared with the conventional TKA group, at 1-year post-TKA

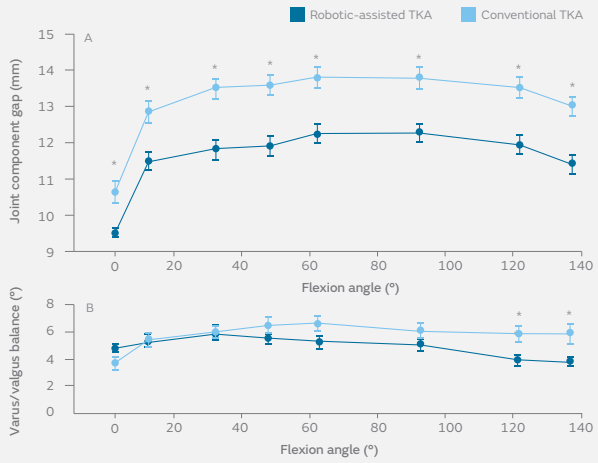

Figure. Intra-operative soft tissue balance throughout the ROM.
**p<0.05*

Conclusions

Compared to conventional TKA with JOURNEY II BCS, the combination of Smith+Nephew handheld robotics and JOURNEY II BCS TKA demonstrated improved soft tissue balance throughout the ROM, more accurate limb alignment and component placement and improved PROMs at 1-year post-TKA.

For detailed product information, including indications for use, contraindications, precautions and warnings, please consult the product's applicable Instructions for Use (IFU) prior to use.

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