+ Evidence in focus
Publication summary

Smith+Nephew

RCT shows Smith+Nephew robotic-assisted (RA) TKA with JOURNEY◊ II BCS improved numbers of patients requiring soft tissue release, natural joint feeling and other patient-reported outcomes (PROMs) versus conventional methods

Bollars P, Nathwani D, Albelooshi A, Ettinger M, Verheyden F, Mievis J, Meshram P, Schotanus M. Imageless handheld robotic-assisted total knee arthroplasty showed better clinical outcomes than conventional total knee arthroplasty: A randomized controlled trial with preliminary results at 1-year follow up. *Knee*. 2025; 56:232–240.

Available at: Knee

Key points

Versus conventional methods, Smith+Nephew RA TKA with JOURNEY II BCS resulted in:

- Significantly **fewer patients needing soft tissue release** (50.0% vs 6.7%; p<0.001)
- Significantly **improved natural joint feeling and other PROMs** (at 1 year: FJS-12, OKS, KSS [function and satisfaction], EQ-5D index score, VAS pain [day and night] and satisfaction; p≤0.029 for all)
- No clinically relevant differences in procedure time or complications at 1 year

Overview

- Prospective RCT (single centre, single surgeon) of 180 TKA patients implanted with JOURNEY II BCS using Smith+Nephew handheld robotics (imageless NAVIO◊ Surgical System; n=90) or conventionally (n=90)*
  - Patients were allocated equally between groups (1:1 randomisation) and were not blinded to their group assignment
- Experienced surgeon (≥200 TKAs per year and ≥5 years using Smith+Nephew handheld robotics) aiming to use functional limb alignment for robotic-assisted cases and mechanical alignment for conventional cases
- Intra-operative outcomes: mean operating time, mean blood loss, polyethylene insert size, soft-tissue releases (recorded by an independent OR nurse)
- Post-operative outcomes (1-year follow-up): OKS, KSS (function, satisfaction, expectation), LEAS, VAS pain, EQ-5D-5L (consists of EQ-5D-index score and EQ-5D-VAS), VAS satisfaction, FJS-12
  - All adverse events were collected (intra-op and post-op)
- There were no significant differences in baseline demographics between groups

Results

- Versus conventional methods, Smith+Nephew RA TKA resulted in significantly:
  - Fewer patients needing soft tissue releases (50.0% vs 6.7%; p<0.001)
  - More patients receiving polyethylene inserts ≤10mm thick (40.0% vs 61.8%; p=0.004)
  - Improved natural joint feeling and other PROMs (FJS-12, OKS, KSS [function and satisfaction], EQ-5D index score, VAS pain [day and night] and satisfaction; Table) at 1 year
  - Shorter length of stay (3.0 vs 2.7 days; p=0.006)
- Procedure time was 76.4 mins for imageless RA TKA and 73.1 mins for conventional TKA (p=0.001; authors did not consider this a clinically relevant difference)
- Similar rate of serious adverse events were reported in both groups

PROM	Smith+Nephew RA TKA with JOURNEY II BCS	Conventional TKA with JOURNEY II BCS	Significantly improved with Smith+Nephew RA TKA (p value)
Change at 1 year (vs pre-op) in mean scores			
OKS	21.6	14.8	**<0.001**
KSS			
Function	40.9	26.8	**<0.001**
Satisfaction	22.7	16.3	**<0.001**
Expectation	3.5	4.1	0.639
EQ-5D index score	0.35	0.23	**<0.001**
VAS pain			
Day	61.1	43.4	**<0.001**
Night	50.9	38.1	**0.029**
VAS satisfaction	9.2	2.1	**<0.001**
EQ-5D VAS	11.2	5.4	0.338
LEAS	3.4	2.4	0.163
Mean score at 1 year			
FJS-12	73.2	53.6	**<0.001**

Table. PROMs with JOURNEY II BCS implanted using Smith+Nephew robotics or conventionally

Conclusions

In one-year RCT results, Smith+Nephew RA TKA with JOURNEY II BCS improved numbers of patients requiring soft tissue release, natural joint feeling and other PROMs versus conventional methods with the same implant, without clinically relevant differences in procedure time or complications.

*179 patients included in the analysis (89 Smith+Nephew RA TKA; 90 conventional TKA).
Abbreviations: EQ-5D VAS = EQ-5D Visual Analogue Scale; FJS-12 = 12-item Forgotten Joint Score; KSS = the Knee Society Score; LEAS = the Lower Extremity Activty Scale; OKS = 12-item Oxford Knee Score; OR = operating room; PROMs = Patient-Reported Outcome Measure; RA TKA = robotic-assisted total knee arthroplasty; RCT = randomised controlled trial; VAS = Visual Analogue Scale.

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