

Total knee arthroplasty inserted with patient specific instruments shows no benefit over conventional instruments: a randomized controlled trial

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Background:

Patient-specific instrumentation (PSI) in total knee arthroplasty (TKA) aims to improve implant alignment and clinical outcomes, but its effectiveness remains uncertain.

Purpose:

This study compared PSI and conventional instrumentation (CVI) in TKA, evaluating patient-reported outcome measures (PROMs), implant alignment and migration over 5 years.

Methods:

This study included 70 knees with primary osteoarthritis at Sahlgrenska University Hospital. Patients were randomized (1:1) to undergo TKA using either PSI or CVI. The primary outcome was the Oxford Knee Score (OKS) at 2 years. Secondary outcomes included additional PROMs, radiographic alignment, and radiostereometric analysis (RSA) of tibial component migration.

Results:

Sixty-eight knees underwent surgery per protocol. At 2 years, OKS improved significantly in both groups, but without a statistically significant difference between groups (mean difference [MD]: 2.1; 95% confidence interval [CI]: -1.5 to 5.7). PSI resulted in slightly increased tibial varus alignment (MD: -1.4°; CI: -2.3° to -0.4°). The tibial components inserted with PSI migrated slightly more into varus (mean difference at 2 years: -0.28 mm, CI: -0.54 to -0.03 mm) and showed higher total point motion (MTPM) during the period 1 to 2 years (mean difference: 0.13 mm; CI 0.01 to 0.25). At 5 years 3 knees had been revised (PSI: 2; CVI: 1).

Conclusions:

PSI did not demonstrate superior outcomes, improved alignment or implant stability compared to CVI during the study period. These findings suggest that PSI may not provide significant benefits over conventional techniques in routine TKA.