

Cementless total knee arthroplasty is clinically non-inferior to cemented with unrestricted kinematic alignment.

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¹Translational Research

INTRODUCTION:

Dual-pivot kinematic alignment (KA) for total knee arthroplasty (TKA) attempts to restore the pre-arthritic joint alignment while maintaining the normal lateral and medial knee pivots. With cemented and cementless (pressfit) variants, the literature is currently unclear on outcomes between these options. The present study sought to determine if pressfits are noninferior to cemented implants in revision rates, radiographic analysis, patient reported outcome (PRO) measures, and range of motion (ROM).

METHODS:

A single-surgeon retrospective analysis of dual-pivot KA-TKA patients identified by CPT code 27447 from 2018-2023 was performed. Overall, 332 patients were included, with 215 pressfits and 117 cemented. Non-inferiority analyses were performed between implant groups based on revision rates, PROs, and ROM. Groups' radiographic measurements were compared.

RESULTS:

The cemented group was older, more obese, and more female ($p \leq 0.001$). Pressfits were inferior to cemented implants on changes in Visual Analogue Score (VAS) for pain (-3.3 ± 3.0 versus -4.6 ± 2.7 , respectively, $p=0.008$, Table 1). However, pressfits were noninferior to cemented implants in PRO deltas including KOOS-JR, PROMIS Global Physical Health, PROMIS Global Mental Health, SANE Affected Knee, and all Knee Society Score (KSS) subscales ($p \geq 0.080$, Table 1). Pressfit versus cemented revision (4.2% versus 1.7%, $p=0.195$) and loosening rates (0.5% vs. 0.0%, $p=0.650$) were noninferior, as were changes in ROM (Flexion: 3.6 ± 9.8 versus 5.2 ± 8.1 , $p=0.143$; Extension: 0.4 ± 1.6 versus 0.9 ± 2.7 , $p=0.900$, Table 2). Radiographic analyses were similar postoperatively in implant alpha, beta, gamma, and delta angles and hip-knee-ankle, medial-proximal-tibial-ankle, lateral-distal-femoral-angle, and joint-line-convergence angles ($p \geq 0.102$), while femoral anatomic-mechanical angles were different (pressfit $5.6 \text{deg} \pm 1.0$ versus cemented $6.1 \text{deg} \pm 0.7$, $p=0.040$, Table 3).

DISCUSSION AND CONCLUSION:

Dual-pivot KA cementless TKAs are similar radiographically and noninferior to cemented implants in revision rates, PROs, and ROM, while cementless patients may experience more pain. Properly indicated patients can expect comparable outcomes between cemented and pressfit TKAs.