#2257 - Free Papers

Clinical Outcomes Of Alignment Outliers (>5° Residual Varus/Valgus) Following Unrestricted Kinematic Alignment TKA

Orthopaedics / Knee & Lower Leg / Joint Replacement - Primary

Andriana Vasilakou, Panagiotis Mandrekas, Antonios Sakkas, Evangelos Zafeiris, Dimitrios Papadopoulos, Nikolaos Stavropoulos, George Babis, **Vasileios Nikolaou**

2nd Department of Orthopaedic Surgery,, Athens, Greece

Keywords: Total Knee Arthroplasty, Kinematic Alignment, Patient Outliers, Clinical Outcomes

Background
Unrestricted kinematic alignment (KA) in total knee arthroplasty (TKA) may lead to postoperative tibial component placement exceeding 5° of varus or valgus when restoring a patient's native anatomy. Whether such residual alignment poses a risk to implant longevity, functional performance, or patient satisfaction remains a point of debate.

Objectives
This study evaluates whether postoperative alignment beyond 5° of varus or valgus adversely affects clinical, functional, or early implant survival outcomes following unrestricted, caliper-verified KA-TKA.

Study Design & Methods
A prospective cohort of patients with primary knee osteoarthritis underwent unrestricted, caliper-verified KA-TKA. Alignment parameters—including Distal Lateral Femoral Angle (DLFA), Proximal Medial Tibial Angle (PMTA), Hip–Knee–Ankle Angle (HKA), and posterior tibial slope (PS)—were measured pre- and postoperatively using CT scanograms and lateral radiographs. Patients demonstrating postoperative PMTA deviation >5° into varus or valgus were classified as alignment outliers. Clinical assessments included the Knee Injury and Osteoarthritis Outcome Score (KOOS), Forgotten Joint Score (FJS), and Self-Administered Patient Satisfaction Scale (SAPS).

Results
Of 182 patients treated with KA-TKA, 22 (12%) demonstrated postoperative alignment exceeding 5° of varus or valgus and were classified as outliers. Mean follow-up was 24 months. (Range 12–48 months). Preoperatively, mean PMTA was 82°, DLFA 91°, HKA −8.45°, and PS 7.95°. Postoperatively, mean PMTA was 83°, DLFA 91°, HKA −7.94°, and PS 7.18°. KOOS improved from 40.4% preoperatively to 78.9% at final follow-up. At approximately two years, the mean FJS was 83%, and patient satisfaction remained high, with a mean SAPS of 94%. No cases of implant failure or aseptic loosening were observed at the latest follow-up.

Conclusions
Postoperative alignment exceeding 5° of varus or valgus did not negatively impact clinical function, patient-reported outcomes, satisfaction, or early implant survival in patients undergoing unrestricted KA-TKA. These findings support the safety of restoring a patient's native alignment even when resulting in >5° of residual varus or valgus. Larger cohorts with extended follow-up are required to confirm long-term implant durability in this subset of KA-TKA patients.

Updated on 10.02.2026 09:47:00