

Balancing the flexion gap first improves flexion and clinical outcome in total knee arthroplasty.

Abstract

Purpose: The purpose of this study was to determine whether the flexion first balancing technique, developed in an attempt to solve the dissatisfaction due to instability in total knee arthroplasties, leads to better restoration of joint line height and medial posterior condylar offset, resulting in better knee flexion, compared to the classic extension first gap balancing technique. The secondary objective is to show non-inferiority of the flexion first balancing technique in terms of clinical outcomes as measured by the Patient Reported Outcome Measurements.

Methods: A cohort of 40 patients (46 knee replacements) operated using the flexion first balancing technique was retrospectively analyzed and compared with a cohort of 51 patients (52 knee replacements) operated using the classic gap balancing technique. Radiographic analysis of the coronal alignment, joint line height and posterior condylar offset was performed. Clinical and functional outcome data were analyzed pre- and postoperatively and compared between both groups. The two-sample t test, Mann Whitney U test, Chi-square test and a linear mixed model were used for performing statistical analyses, after normality analyses were executed.

Results: Radiologic evaluation showed a decrease in posterior condylar offset using the classic gap balancing technique ($p=0.040$) versus no change using the flexion first balancing technique ($p=n.s.$). No statistically significant differences were noted for joint line height and coronal alignment. Using the flexion first balancer technique leads to a greater postoperative range of motion with deeper flexion ($p=0.002$) and a better Knee injury and Osteoarthritis Outcome Score (KOOS) ($p=0.025$).

Conclusion: The Flexion First Balancer technique is a valid and safe technique for TKA, resulting in better preservation of PCO with consequently greater postoperative flexion, better KOOS scores and no need for ligament releases.

Keywords: Total knee arthroplasty, flexion first balancing technique, posterior condylar offset, flexion, PROMs, functional outcomes, clinical outcomes