No Difference in Patient-Reported Outcomes Despite Delayed Early Postoperative Recovery After Cruciate-Retaining Total Knee Arthroplasty (CR-TKA) Compared to Unicompartmental Knee Arthroplasty (UKA)

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INTRODUCTION: Unicompartmental knee arthroplasty (UKA) preserves native knee anatomy and allows for a more 'natural feeling' knee. In contrast, total knee arthroplasty (TKA) involves resurfacing all compartments of the knee, thereby sacrificing more of the knee's native anatomy. However, the cruciate-retaining TKA (CR-TKA) design aims to better approximate native knee biomechanics by preserving the posterior cruciate ligament. While the existing research claims that UKA may result in improved functional outcomes and a more natural-feeling knee compared to TKA, few studies have specifically evaluated these advantages in relation to cruciate-retaining TKA (CR-TKA), which may offer similar kinematic advantages. On that account, this study aimed to compare 1-year PROMs, likelihood of achieving Minimal Clinically Important Difference (MCID) and Patient Acceptable Symptom State (PASS) thresholds, discharge disposition, length of stay (LOS), 90-day readmission, 90-day reoperation, and mortality rate between mUKA and CR-TKA.

METHODS: Between 2016-2023, a total of 24,201 primary elective TKAs and 2070 primary elective UKAs were performed at a large tertiary academic center, and data from each were longitudinally maintained in an institutional database. After exclusion, 2805 CR-TKAs (2769 patients) and 702 mUKAs (696 patients) were included in the final analysis of this retrospective study. Multivariable logistic regression models were used to compare 1-year PROMs between both cohorts using odds ratio (OR) and 95% confidence interval (CI). PROMs were obtained preoperatively and after one-year and included Knee Injury and Osteoarthritis Outcome Score (KOOS-pain), physical function (KOOS-PS), and joint replacement (KOOS-JR) scores, as well as the Veterans Rand 12-Item Health Survey mental component summary (MCS) score. Clinically relevant improvements were assessed through minimal clinically important difference (MCID) and Patient Acceptable Symptom State (PASS) threshold achievement. The models were controlled for demographics, baseline PROMS, and clinical confounding variables. Failure to reach the threshold was modeled and considered as the event of interest in all the models. Additionally, 1-year satisfaction using the PASS questions was compared. Healthcare utilization outcomes including discharge disposition, LOS, 90-day readmission, 90-day reoperation, and mortality rates were compared between both groups. Due to the absence of reoperations in the mUKA cohort and the absence of mortality in both groups, regression analysis could not be conducted.

RESULTS: CR-TKA was not significantly associated with one-year PROMs (KOOS-pain, PS, JR) compared to mUKA (Pain OR: 0.26, PS OR: -0.41, JR OR: 0.48, All p values>0.05). Similarly, CR-TKA also did not correlate with the failure to achieve PASS (OR: 0.80) or with the threshold failure of MCID Pain (OR: 1.07), MCID PS (OR: 0.90), and MCID JR (OR: 0.96) compared to mUKA (All P values>0.05). Odds of failing to meet individual PASS thresholds of pain (OR:0.90), PS (OR:1.09), and JR (OR:0.93) also did not significantly associate with undergoing CR-TKA compared to mUKA (all p values>0.05). However, CR-TKA increased the odds of length of stay> 3 days (OR: 12.93, p<0.001) and non-home discharge (OR: 4.39, p=0.002). However, no significant increase in the odds of 90-day readmission (OR: 1.71, p=0.055) was observed.

DISCUSSION AND CONCLUSION: Patients can expect similar long-term outcomes with CR-TKA and mUKA. CR-TKA has the added benefits of lower revision risk and no need for future conversion, making it a strong long-term option. UKA, however, has shorter hospital stays and less frequent non-home discharges, which may be better for patients seeking quicker recovery. Accordingly, these findings suggest a tailored approach to procedure selection based on individual priorities and long-term goals.