How Do Patient-Perceived Outcomes Compare in Obese Patients Undergoing Primary Total Knee Arthroplasty Versus Unicompartmental Knee Arthroplasty?

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INTRODUCTION: Unicompartmental knee arthroplasty (UKA) and total knee arthroplasty (TKA) are established surgical options for patients with isolated compartmental knee osteoarthritis (OA). Compared to TKA, UKA offers potential benefits including preservation of native knee kinematics, faster recovery, and improved postoperative range of motion. However, UKA is also associated with higher revision rates. A recent meta-analysis found no significant differences in patient-reported outcome measures (PROMs) between UKA and TKA in patients with isolated compartmental OA. Despite the high prevalence of obesity among patients undergoing knee arthroplasty, no prior study has specifically compared PROMs between UKA and TKA in this subgroup. Obesity may influence implant biomechanics, complication risk, and functional recovery, and thus may affect patient satisfaction following each procedure. Therefore, this study aims to compare postoperative PROMs between obese patients undergoing UKA and TKA for isolated compartmental OA.

METHODS: A single tertiary institutional database was queried for patients who underwent UKA or TKA between 2016 and 2023. Inclusion criteria included BMI $\geq$ 30 kg/m^2, age $\geq$ 18 years, and completed pre- and postoperative PROMs. Bilateral procedures were excluded. Patients were matched 1:1 based on age, BMI, gender, diabetes, chronic kidney disease, heart failure, osteoporosis, cirrhosis, stroke, and compartment involvement. Evaluated PROMs included Physical Function Short Form Survey (SF-10a), Patient-reported Measurement Information Systems (PROMIS) Global Physical and Mental Survey, and Knee Disability and Osteoarthritis Outcome Score Physical Function Short Form (KOOS-PS). Minimally clinically important differences (MCID) were calculated based on delta scores, or the difference between absolute pre- and postoperative scores. Medical complications in the 90-day postoperative period, and one- and two-year surgical complications were also reported.

RESULTS SECTION: After matching, 55 UKAs and 55 TKAs were identified. There was no significant difference between cohorts in terms of average age ($p = 0.64$), BMI ($p = 0.83$), gender ($p = 0.70$), compartment involvement ($p = 0.25$), or any other assessed comorbidity. There was no difference between UKA and TKA cohorts in the pre- and postoperative absolute scores, delta scores, or proportion of patients who achieved clinically significant improvement for all measured PROMs (Table 2). There was also no significant difference between cohorts in the 90-day medical complication rate (0.0% vs 5.5%, $p = 0.24$), or in the one- and two-year rates of periprosthetic joint infection (PJI), loosening, and reoperation.

DISCUSSION: This study showed that obese patients undergoing UKA and TKA for isolated compartment OA experience comparable postoperative patient-reported, medical, and surgical outcomes. These findings align with prior meta-analyses in the general knee arthroplasty population, which reported no overall difference in PROMs between UKA and TKA but extend this evidence to the obese patient subgroup. Given the potential biomechanical challenges and increased risk of surgical complications previously associated with obesity, our results suggest that UKA remains a viable surgical option in appropriately selected obese patients. Larger, prospective studies with long-term follow-up are warranted to assess implant survivorship and revision risk in this population, as well as to determine whether subtle differences in patient satisfaction emerge over time.

SIGNIFICANCE/CLINICAL RELEVANCE: Obese patients with isolated compartmental OA demonstrated similar short- to mid-term complications and patient-perceived outcomes following TKA and UKA. These results support UKA as a reasonable surgical alternative in carefully selected obese patients.

	TKA	**UKA**	**P Value**
SF-10a	N = 50	N = 47	
Preoperative score	37.49 ± 5.44	35.67 ± 5.79	0.1458
Postoperative score	44.82 ± 7.66	43.14 ± 7.31	0.1771
Delta score	7.33 ± 5.98	7.47 ± 6.52	0.9052
MCID-I	37 (74%)	39 (83%)	0.4086
No change	9 (18%)	5 (11%)	0.4581
MCID-W	4 (8%)	3 (6%)	1
PROMIS Mental	N = 55	N = 53	
Preoperative score	51.09 ± 9.23	49.62 ± 9.37	0.5069
Postoperative score	53.70 ± 10.05	52.31 ± 9.30	0.3471
Delta score	2.61 ± 7.36	2.69 ± 6.70	0.7987
MCID-I	23 (42%)	29 (55%)	0.2507
No change	14 (25%)	12 (23%)	0.9071
MCID-W	18 (33%)	12 (23%)	0.3396
PROMIS Physical	N = 55	N = 54	
Preoperative score	40.68 ± 6.86	38.89 ± 8.29	0.3554
Postoperative score	47.40 ± 8.95	45.94 ± 9.68	0.4689
Delta score	6.72 ± 7.51	7.05 ± 8.36	0.8439
MCID-I	36 (65%)	35 (65%)	1
No change	12 (22%)	16 (30%)	0.4752
MCID-W	7 (13%)	3 (6%)	0.3345
KOOS-PS	N = 35	N = 43	
Preoperative score	56.74 ± 14.79	50.99 ± 16.08	0.2319
Postoperative score	74.62 ± 16.81	70.16 ± 12.98	0.2319
Delta score	17.88 ± 17.88	19.17 ± 17.62	0.9439
MCID-I	25 (71%)	30 (70%)	1
No change	7 (20%)	11 (26%)	0.7552
MCID-W	3 (9%)	2 (5%)	0.8116

Table 1. Patient-Reported Outcome Measures for obese patients undergoing primary total knee arthroplasty and unicompartmental knee arthroplasty.