

Are There Differences in Patient-Reported Outcomes Based on Patellofemoral Resurfacing in Primary Total Knee Arthroplasty? A Propensity Matching Study

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INTRODUCTION: Patella resurfacing has been reported to be performed in up to 94% of total knee arthroplasties (TKA) in the United States. However, there are no established best practices for its use in primary TKA, given the lack of consensus data surrounding resurfacing. While a theoretical benefit is the reduction of anterior knee pain and implant longevity, the influence of patella resurfacing on anterior knee pain remains controversial. Previous studies have demonstrated up to a five- fold reduction in its prevalence among patients with resurfaced knees. More recent studies report equivalent rates of anterior knee pain after TKA. Patella resurfacing is also associated with complications, including patella fracture, instability, and extensor mechanism disruption. A previous study demonstrated that patients with resurfaced patella have over a ten-fold increase in patellar fracture. These benefits and risks may influence patient reported outcomes after TKA. Previous studies have investigated patient-reported outcome measures (PROMs) between the two cohorts; however, these studies were limited by a relatively small sample size and/or lack of propensity matching. Therefore, this study aims to compare PROM scores in propensity matched patients who underwent TKA with and without patella resurfacing using thresholds of clinical significance.

METHODS: A total of 11,210 consecutive patients who underwent primary TKA at a tertiary institution were screened following IRB approval. Patients were categorized based on whether they underwent patellar resurfacing with TKA. Patients were propensity matched in a 1:2 ratio by age, gender, body mass index, diabetes, chronic kidney disease, heart failure, osteoporosis, cirrhosis, and stroke history. The Physical Function Short Form (SF-10a), Patient Reported Outcome Measuring Information Systems (PROMIS) Global Mental and Global Physical Forms, and the Knee Injury and Osteoarthritis Outcome Score – Physical Function Short Form (KOOS-PS) were extracted. The mean PROM scores were recorded for each cohort. The difference between the mean pre- and post-operative PROM scores was calculated as delta. The delta score was then used to determine the threshold of minimal clinically important difference with improvement (MCID-I) and worsening (MCID-W). Postoperative complications within 90 days, one year, and two years were recorded.

RESULTS SECTION: Following propensity-matching, 622 patients without resurfacing and 1,244 with resurfacing remained for analysis. No demographic differences were observed between groups (p>0.05). Ninety-day complication rates were equal between resurfaced and non-resurfaced patients (p>0.05). One- and two-year complications occurred at similar rates in both groups (p>0.05). Absolute preoperative SF-10a scores were lower in the non-resurfaced group (36.71 vs 37.15, p = 0.0488), however all other absolute preoperative and postoperative PROM scores were similar between groups (p>0.05). Patients without resurfacing experienced greater rates of no change according to the PROMIS Physical (25% vs 19%, p = 0.0123). All other proportions of no change, improvement, worsening, as well as delta scores, were similar between groups (p>0.05).

DISCUSSION: This propensity-matched study found no differences in patient-perceived outcomes with and without patellofemoral resurfacing in primary TKA. Preoperative scores were lower on average in non-resurfaced patients in the SF-10a, but no differences in postoperative and delta scores, as well as proportions of improvement, indicate similar outcomes postoperatively. While non-resurfaced patients had greater rates of no change in the PROMIS Physical, similar delta scores and proportions of improvement suggest that these patients experienced similar postoperative improvement, suggesting patellofemoral resurfacing did not significantly change patient-reported outcomes following primary TKA.

SIGNIFICANCE/CLINICAL RELEVANCE: Patellofemoral resurfacing does not significantly impact patient-perceived outcomes following primary total knee arthroplasty.

	Not Resurfaced	Resurfaced	P Value
SF-10a	N = 582	N = 1,150	
Preoperative score	36.71 ± 5.42	37.15 ± 5.20	0.0488
Postoperative score	42.87 ± 7.73	43.18 ± 7.59	0.4765
Delta score	6.16 ± 6.64	6.03 ± 7.03	0.5233
MCID-I	406 (70%)	768 (67%)	0.231
No change	118 (20%)	252 (22%)	0.4693
PROMIS Mental	N = 584	N = 1,172	
Preoperative score	50.21 ± 9.15	50.77 ± 8.50	0.2393
Postoperative score	52.02 ± 9.03	52.24 ± 8.61	0.5985
Delta score	1.81 ± 6.63	1.47 ± 6.50	0.3966
MCID-I	290 (50%)	548 (47%)	0.2733
No change	126 (22%)	269 (23%)	0.5549
PROMIS Physical	N = 584	N = 1,173	
Preoperative score	41.31 ± 7.39	41.57 ± 7.05	0.421
Postoperative score	47.37 ± 8.69	47.24 ± 8.28	0.9699
Delta score	5.96 ± 7.20	5.67 ± 7.12	0.6251
MCID-I	363 (62%)	776 (66%)	0.1096
No change	144 (25%)	227 (19%)	0.0123
KOOS-PS	N = 493	N = 938	
Preoperative score	55.83 ± 13.35	44.23 ± 14.42	0.8836
Postoperative score	70.41 ± 15.65	70.66 ± 14.88	0.8854
Delta score	14.58 ± 16.17	15.32 ± 16.29	0.4569
MCID-I	342 (69%)	662 (71%)	0.68
No change	118 (24%)	192 (20%)	0.1485

Table 1. Patient-Reported Outcome Measures for patients with and without patellofemoral resurfacing following primary total knee arthroplasty.