

Trends and Outcomes Comparing Resurfaced to Un-Resurfaced Total Knee Arthroplasty Patients in the American Joint Replacement Registry, 2012-2021

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INTRODUCTION:

Recent reports on patellar resurfacing in total knee arthroplasty (TKA) have demonstrated conflicting results. The decision to resurface the patella is often made by balancing the risks of anterior knee pain, revision surgery, and progressive arthritis with the risks of patellar fracture, avascular necrosis, and prosthesis complications. We sought to evaluate patients undergoing TKA in the American Joint Replacement Registry (AJRR) from 2012-2021 and compare the trends in resurfaced patella (RP) compared to un-resurfaced patella (URP) as well as patient reported outcomes (PROs) and revision rates.

METHODS:

The AJRR was used to identify TKA patients from 2012-2021 with a primary diagnosis of osteoarthritis (n=642,363). RP and URP groups were compared via Student's t-test and chi square analysis where appropriate for demographic characteristics, logistic regression for PROs (reaching MCID for KOOS Jr. or PROMIS at 1 year), and Cox proportional hazards model for revision analysis. Sub-analysis was performed to determine interaction between resurfacing and surgical location (hospital vs. ambulatory center), TKA implant type (cemented vs. uncemented), and surgeon volume (top-quartile surgeon volume or not).

RESULTS:

During the study period, the proportion of RP decreased significantly from 95.9% in the AJRR population to 90.4% (n=838,178). URP patients differed significantly in age (66.6 vs. 67.3y), had lower comorbidity scores (2.67 vs. 2.69), shorter operative times (88.2 vs. 89.9m), higher proportion of males (42.1 vs. 39.7%), and a lower proportion of Caucasians (87.5 vs. 89.5%). URP patients were more likely to have a TKA uncemented implant (4.9% vs. 1.6%) and to undergo revision during the study period (1.73 vs. 1.44%, p<0.001). URP patients were more likely to be done at higher volume hospital (yearly volume 234 vs. 201) and by higher volume surgeons (yearly volume 52.8 vs. 34.6).

Survival analysis demonstrated 20% increased risk of revision surgery over the study period among URP controlling for other variables (hazard ratio [HR] 1.21, 95% CI [1.078-1.35], p=0.0011). There was no significant difference in reaching MCID for PRO scores at one year postoperatively between URP and RP patients (odds ratio [OR] 1.06, 95% CI [0.71-1.58], p=0.776). Trends in increased URP proportion, higher revision risk, and no significant difference in PRO were unchanged in sub-analysis evaluating only cemented TKA patients.

DISCUSSION AND CONCLUSION:

This study updates earlier studies, which have evaluated trends in URP utilization in TKA procedures in the United States. Similarly, we note increasing URP in the AJRR population over time, with a higher revision rates but no significant difference in PRO at one year between URP and RP TKA patients. URP is particularly associated with higher volume surgeons and surgeons operating in ambulatory centers. Future studies may focus on identifying the causes for revision between RP and URP patients, and whether revised URP patients improve significantly in the setting of isolated patella resurfacing revision.

