

Should The Patella Be Resurfaced During Primary Total Knee Arthroplasty? An Updated Meta-analysis And Systematic Review

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AUTHOR DISCLOSURES

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ABSTRACT INTRODUCTION: Total knee arthroplasty (TKA) involves the manipulation of the femur and the tibia, but the decision to resurface the patella remains controversial. This paper aims to provide an updated meta-analysis and systematic review of randomized controlled trials to assess the effectiveness of patellar resurfacing by comparing various per-operative and postoperative outcomes and patient-reported outcomes.

METHODS: A systematic review and meta-analysis were performed. Medline, Embase, and CINAHL were searched on April 3, 2024, for randomized controlled trials that compared TKA with patellar resurfacing (PR) and without patellar resurfacing (NPR). The Cochrane risk-of-bias tool for randomized trials was used for bias assessment. Articles that evaluated revision TKA, patellectomy, patellofemoral replacement, patelloplasty, secondary patellar resurfacing, and patellar reshaping were excluded. The primary outcomes of interest included reoperation rate, patient satisfaction, anterior knee pain (AKP), change in the range of motion (ROM), total Knee Society Score (KSS), and KSS function test scores. Secondary outcomes included the Feller score, Oxford scores, Visual Analog Scale (VAS) pain score, Insall-Salvati ratio, patellar tilt, KOOS score, operative time (OT), and operative blood loss. Outcomes were pooled using the random-effects model and presented as mean difference (MD) with a 95% confidence interval (CI).

RESULTS SECTION: From the initial 2,021 articles retrieved from the databases, 28 articles were eligible for the final meta-analysis. The reoperation rate was lower in the PR group (0.70 [0.59, 0.83], $P < 0.0001$), but there were no statistically significant differences for ROM (-0.31 [-2.08, 1.46], $P = 0.73$), AKP (0.60 [0.33, 1.07], $P = 0.69$), or satisfaction rate (1.51 [0.78, 2.92], $P = 0.22$) between the two groups. The KSS test favored NPR at less than 1 year (0.92 [0.05, 1.80], $P = 0.04$), 1 year (1.22 [0.40, 2.05], $P = 0.004$), 2 year (0.69 [-0.11, 1.49], $P = 0.09$), 4 year (1.18 [0.49, 1.87], $P = 0.0008$), and 5 year follow-up (1.84 [0.09, 3.59], $P = 0.04$). The KSS function test favored NPR at 1 year (1.58 [0.42, 2.73], $P = 0.007$), 3 years (1.62 [0.49, 2.75], $P = 0.005$), and 5-year follow-up (2.28 [1.18, 3.38], $P < 0.0001$). The OT was shorter in the NPR group (5.66 [2.31, 9.02], $P = 0.0009$). The Feller score, Oxford score, VAS pain score, Insall-Salvati ratio, patellar tilt angle, KOOS score, and operative blood loss were statistically insignificant between the two groups.

DISCUSSION: In this meta-analysis, patellar resurfacing resulted in fewer reoperations, while patients without patellar resurfacing showed slightly better KSS total and functional scores. The decision to resurface the patella or not may not be binary. Surgical technique as well as patella-femoral component factors can influence the outcome of surgery. In addition, patellar denervation, lateral facetectomy, and overall knee joint stability can also affect anterior knee pain following TKA. Finally, potential complications resulting from resurfacing, such as fracture, asymmetric resurfacing, overstuffing of the P-F compartment, and avascular necrosis, should be considered along with the diversity in patient demographics. Some studies have favored routine resurfacing in selected groups, including females, patients with inflammatory arthritis or obesity, and those who find stair climbing imperative. However, no official guidelines are established. These factors may indicate that the decision to resurface the patella should be made selectively based on intraoperative findings and the patient's needs.

SIGNIFICANCE/CLINICAL RELEVANCE: The need to universally resurface the patella during total knee arthroplasty (TKA) remains controversial. Leaving the patella unsurfaced results in equivalent clinical outcomes but higher rates of reoperation at long-term follow-up. The decision to resurface the patella at the time of TKA should be based on intraoperative findings, surgeon philosophy, and patient demands. The complications of patellar resurfacing should also be considered.

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