Comparison of Patient-Reported Outcomes in Hinged and Non-Hinged Revision Total Knee Arthroplasty: A Matched Cohort Analysis

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Background: Hinged prostheses in revision total knee arthroplasty (rTKA) are typically reserved for cases of severe bone loss and/or ligamentous insufficiency. The increased constraint of the hinge (i.e., fewer degrees of freedom) is critical for providing sufficient stabilization in these complex cases, but also results in higher forces throughout the construct, which may increase the risk of re-revision due to aseptic loosening. This study compared patient-reported outcome measures (PROMs) in case-control matched cohorts of hinged versus non-hinged rTKAs.

Methods: A retrospective review of 1,477 rTKAs was performed. After exclusions, 62 hinged and 730 non-hinged implants were available for matching. A total of 55 aseptic hinged rTKAs were case-control matched to 55 aseptic non-hinged rTKAs based on demographics of age, sex, BMI, and ASA-PS classification. The primary outcomes of the study were PROMs and reoperation rates. A *P*-value of 0.05 was considered statistically significant.

Results: The two matched groups did not differ by demographics or comorbidities ($P \geq 0.225$); except for an increased prevalence of lumbar spine disease in the non-hinged group (26% versus 11%, $P=0.048$), which did not affect PROMs ($P \geq 0.100$). In addition, no differences in PROMs were observed between groups at any time interval ($P \geq 0.105$). Furthermore, there was a slightly higher incidence of all-cause reoperation due to patella/extensor mechanism (11% versus 5%) and all-cause septic reoperation (9% versus 2%) in the hinged group, but these differences did not reach statistical significance ($P \geq 0.190$).

Potential Impact: This study demonstrated that PROMs were not significantly different for patients who received a hinged rTKA compared to a non-hinged rTKA, suggesting that patients may benefit from the increased stability provided by the hinge. The association with extensor mechanism complications in the hinged rTKA group likely reflects tthe selection bias inherent in this study design, as more complex cases were more likely to receive hinged devices.