Outcomes in Total Knee Arthroplasty Polyethylene Designs: Not All Bearings Are Created Equal

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INTRODUCTION:

With various advancements in implant design, there remains debate regarding the ideal polyethylene design and how to manage the posterior cruciate ligament (PCL) in total knee arthroplasty (TKA). This study aimed to compare three variations of polyethylene design in TKA.

METHODS:

This was a retrospective cohort study of patients who underwent primary TKA for a diagnosis of osteoarthritis by a single surgeon. Cases with a cruciate retaining (CR), medial congruent (MC), or ultracongruent (UC) insert were included. The PCL was excised in all MC and UC cases. Pre- and postoperative Knee Injury and Osteoarthritis Outcome Score Joint Replacement (KOOS-JR) were collected, and reported at 6 months, 1 year, and 2 years postoperatively. Forgotten Joint Score (FJS) was collected at least one year postoperatively. Secondary outcomes included range of motion (ROM) and revisions. Comparisons between MC vs. CR, MC vs. UC, and CR vs. UC inserts were performed.

RESULTS:

Final analysis included 784 cases (124 MC, 236 CR, 424 UC). When comparing CR to MC, the CR group had a significantly higher FJS (69.8 vs. 67.6, P=0.042). However, the MC group had a greater improvement in ROM (26.6º vs. 21.6º, P=0.034). When comparing UC to MC, there was no difference in FJS (69.7 vs. 67.6, P=0.575). The MC group had a significantly greater improvement in ROM compared to the UC group (26.6º vs. 21.7º, P=0.029). There were no differences between UC and CR in FJS or ROM. Across all groupings, there were no differences for change in KOOS-JR nor for the proportion of patients to meet the minimal clinically important difference (MCID).

DISCUSSION AND CONCLUSION:

Despite the intent of the MC bearing to better mimic native knee kinematics, patients with an MC insert have a lower FJS, and thus more awareness of their joint, compared to less constraint with PCL retention.