No One-Size-Fits-All: Surgical Approach Dictates Optimal Bearing Choice in 30,000 THAs Over 25 Years

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INTRODUCTION:
Dislocation remains a common and consequential complication following primary total hip arthroplasty (THA). While both surgical approach and bearing surface individually influence dislocation risk, few studies have evaluated their combined impact. This study assessed the long-term dislocation risk stratified by surgical approach and bearing construct to develop approach-specific recommendations for bearing selection.
METHODS: We identified 30,246 primary THAs performed from 1998-2022 at a single academic institution. Hips were stratified by bearing surface including standard polyethylene (PE), elevated rim/face-changing PE, and dual-mobility (DM) constructs. There were 14,611 posterior (8587 standard, 5207 elevated rim/face-changing, 816 DM), 8968 anterolateral (AL; 7433 standard, 1358 elevated rim/face-changing, 171 DM), and 6667 direct anterior (DA; 6541 standard, 91 elevated rim/face-changing, 35 DM). The 10-year absolute and relative risks of dislocation controlling for demographics, femoral head size, select comorbidities, and surgical indication were evaluated. Mean age was 65 years, BMI was 30 kg/m^2 and 52% of patients were female. Mean follow-up was 6 years.
RESULTS: The absolute risks of dislocation at 10 years in posterior, AL, and DA THAs were 4%, 2% and 1%, respectively. In posterior THAs, DM constructs significantly reduced relative dislocation risk (RR<0.5, p<0.01) compared to standard PE liners. In AL THAs, standard PE liners had the lowest absolute dislocation risk (1%), whereas elevated rim/face-changing PE liners were associated with double the relative risk of dislocation (RR 2, p<0.01). In DA THAs, bearing surface had no impact on dislocation risk.
DISCUSSION AND CONCLUSION: A one-size-fits-all approach to bearing surface is suboptimal, and surgical approach should guide bearing selection in primary THAs. For posterior approach, DM constructs significantly reduced the relative risk of dislocation and should be considered in high-risk cases. For AL approach, standard PE liners had the lowest absolute dislocation risk. Finally, all DA THAs had a lower dislocation risk regardless of bearing selection.