Do Larger Femoral Heads Beyond 36mm Reduce Dislocation Rates Following Primary THA?

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INTRODUCTION: Larger femoral heads are theorized to improve stability by increasing jump distance. The literature has generally defined a large diameter femoral head as 36mm or greater, but it remains unclear whether femoral heads >36 mm offer additional protection against dislocation. We hypothesized that utilization of 40- and 44-mm femoral heads would not significantly reduce dislocation rates.

METHODS: This was a retrospective cohort study of 8007 primary total hip arthroplasties (THA) performed at a tertiary, high-volume orthopedic academic center between 2016 and 2022. Patients age < 18 years and dual mobility liners were excluded from the study. Remaining patients were stratified by femoral head diameter into 36 mm (n=7,486) and 40/44 mm groups (n=521), and dislocation rates were assessed with univariable tests and multivariable cox regression analysis. Median follow-up was 1.5 years [range: 0.25-8.06 years].

RESULTS: There were no differences in dislocation rates at 90-days (0.6% vs 0.0%;P=0.11) or at last follow-up (1.9% vs 2.3%;P=0.60) between 36mm and 40/44mm heads, respectively. Multivariable cox regression analysis controlling for patient demographics, comorbidities, and surgical variables, confirmed no reduction in dislocation with 40 and 44mm head use (P=0.963). Posterior approach (HR: 3.3 [1.6-6.9]; P=0.002) and history of neuromuscular disorder (HR: 2.7 [1.1-6.9]; P=0.03) had higher risk for dislocation while use of robotic technology was associated with reduced risk for dislocation (HR:0.49 [0.29-0.85]; P=0.01).

DISCUSSION AND CONCLUSION:

In this large institutional cohort, increasing head size beyond 36 mm to 40/44 mm did not significantly reduce dislocation risk. These results suggest a threshold effect at 36 mm when utilizing larger heads for additional stability in primary THA.