Should We Use The Largest Femoral Head With The Smallest Acetabular Component in Primary Total Hip Arthroplasty

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INTRODUCTION: There has been increasing use of larger femoral head sizes in an effort to mitigate the risk of dislocation after total hip arthroplasty (THA). As such, manufacturers have created thinner highly cross-linked polyethylene (HXLPE) liners to maximize effective head size. We investigated if there was a decreased dislocation risk or a survivorship penalty if the largest head was chosen at the smallest compatible acetabular component size.

METHODS: We reviewed 1886 posterior approach primary THAs with HXLPE from 2005 – 2021. Subjects were divided into 3 groups based on acetabular component transition points at which a larger femoral head could be used: Group 1 was 28-mm (n=19) versus 32-mm (n=89) heads, Group 2 was 32-mm (n=383) versus 36-mm (n=441) heads, and Group 3 was 36-mm (n=815) versus 40-mm (n=139) heads. Mean age was 66 years, 75% were female, and mean BMI was 30 kg/m^2. Forty-eight percent had ceramic and 52% had cobalt-chrome heads. Mean follow-up was 6 years.

RESULTS: There were no liner fractures and 2 (0.1%) liner dissociations. The 10-year survivorships free of dislocation, any revision, and any reoperation were 95%, 95% and 93%, respectively. The 5-year survivorship free of dislocation for Group 1 was 95% for 28-mm and 99% for 32-mm heads; for Group 2, 96% for 32-mm and 99% for 36-mm heads, and for Group 3, 96% for 36-mm and 96% for 40-mm heads. Cox regression demonstrated no difference in reoperation or revision rates between head sizes in any group.

DISCUSSION AND CONCLUSION: Choosing the largest femoral head with the smallest compatible cup for 32-mm, 36-mm, and 40-mm heads did not increase risk for liner-related complications, revisions, or reoperations. There was no difference in dislocation risk when using the larger femoral head at transitional cup sizes, though this study was underpowered to detect this difference.