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Is it Safe? Using Big Heads and Small Acetabular Components in Total Hip Arthroplasty

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Introduction: Modern total hip arthroplasty (THA) increasingly employs larger femoral heads to optimize hip stability. However, the combination of large heads and small acetabular component poses a potential risk for implant failure secondary to catastrophic liner fracture or liner wear and its sequela. The purpose of this study was to evaluate early failure and long-term outcomes including wear rates in THA using large heads and small acetabular components.

Methods: 825 patients undergoing primary THAs from 2000-2016 with 36mm heads and cups, ≤52mm with highly crosslinked polyethylene liners, and minimum 2-year follow-up were identified through a total joint registry. Mean age was 66 years, 88% were females, and mean body mass index (BMI) was 30 kg/m2. Competing risk analysis with death as competing risk was utilized to evaluate the cumulative incidences of dislocation, all-cause reoperation, and revision. All patients with minimum 10-year radiographic follow-up (n=18) were analyzed for femoral head penetration and osteolysis. Mean follow-up was 4 years (range, 2-12 years).

Results: There were 12 revisions (0.8%) within one year of THA. There were no liner fractures. The 10-year cumulative incidences of dislocation, reoperation and revision rates were 3.2%, 9.3%, and 5.6%, respectively. Mean femoral head penetration was 0.378mm (95% CI 0.76-0.68) and mean steady-state femoral head penetration was 0.043mm/yr (95% CI 0.0039-0.082) at mean follow-up of 11 years.

Conclusions: Pairing large femoral heads with small acetabular components has minimal risk of early catastrophic failure with similar long-term rates of dislocation, all-cause reoperation, and revision surgery compared to other component size pairings. 10-year radiographic follow-up demonstrated excellent wear characteristics and durability, with no evidence of osteolysis.

Notes