

# Total Hip Arthroplasty versus Birmingham Hip Resurfacing in Males under 50: A National Registry Study

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## INTRODUCTION:

This is a national registry study comparing outcomes for total hip arthroplasty (THA) (uncemented and hybrid) versus Birmingham hip resurfacing (BHR) carried out on male patients  $\leq 50$  years old at time of index surgery.

## METHODS:

The inclusion criteria were: surgery between 1999-2016, male patients  $\leq 50$  years old with osteoarthritis. Exclusion criteria were: previous hip surgery, bilateral surgery, fully cemented THA. Primary outcome was revision-free survival. Subgroup analysis to evaluate effect of THA head size, THA bearing type, type of THA fixation, compared to BHR. Further subgroup analysis was performed looking at surgeon volume and patient ASA. Secondary outcome was 5-year oxford hip score (OHS). In total, 473 BHRs and 3,434 THAs (2,822 uncemented, 612 hybrid) included with a mean follow up of 11.76 (standard deviation [SD]=3.63) years and 12.43 (SD=5.11) years, respectively.

## RESULTS:

All cause revision was significantly less for the BHR group with a revision rate/100-component-years of 0.503 (95% CI 0.327-0.717) for BHR and 0.8997 (95% CI 0.812-0.994) for THA, ( $p=0.007$ ). Kaplan-Meier estimates of revision-free survivorship is similar in both groups until approximately 12 years when it was 94.0% for BHR and 90.9% for THA ( $p=0.017$ ), with  $n=241$  and  $n=1,750$  patients remaining in each group respectively. At 17 years there is a significant difference ( $p<0.001$ ) in the survivorship at 92.7% (95% CI 89.7% - 95.6%) and 84.8% (95% CI 83.1% - 86.4%), respectively.

Subgroup analysis revealed that for THA with head size of 32mm ( $n=810$ ) or 36mm ( $n=982$ ), the revision rate/100-component-years was not significantly different to that of BHR, at 0.731 ( $p=0.103$ ) and 0.555 ( $p=0.516$ ), respectively. For head sizes  $\leq 28$ mm ( $n=1270$ ) or  $\geq 36$ mm ( $n=364$ ) the rate was 0.9196 and 1.9261, respectively, significantly greater than that of BHR ( $p<0.001$ ).

The risk of revision in the THA group compared to BHR carried a hazard-ratio of 1.696 ( $p=0.0072$ ), however, when further analyzed removing THA performed on patients with an ASA of  $>2$  and by surgeons with a surgical volume of less than 25 THA/year the hazard ratio reduced to no longer being significant at 1.1439 ( $p=0.5329$ ). There was no difference between the groups at 5-years in OHS.

**DISCUSSION AND CONCLUSION:** From the analysis of this national registry there is a significantly lower revision rate/100-component-years for BHR compared to uncemented or hybrid THA. This difference is most profound when head sizes of  $\leq 28$ mm and  $\geq 36$ mm are used.

