

## MINIMUM 10 YEAR SURVIVAL AND OUTCOME OF THE BIRMINGHAM HIP RESURFACING – AN INDEPENDENT SERIES

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### Introduction

Hip resurfacing (HRA) designer centres have reported survivorships between 88.5–96% at 12 years. Arthroplasty Registries (AR) reported less favourable results especially in females gender and small sizes. The aim of this study was to evaluate the minimum 10-year survival and outcome of the Birmingham Hip Resurfacing (BHR) from an independent specialist centre.

### Methods

Since 1998, 1967 BHRs have been implanted in our centre by a single hip resurfacing specialist. The first 249 BHR, implanted between 1999 and 2001 in 232 patients (17 bilateral) were included in this study. The majority of the patients were male (163; 69%). The mean age at surgery was 50.6 years (range: 17 – 76), with primary OA as most common indication (201; 81%), followed by avascular necrosis (23; 9.2%) and hip dysplasia (11; 4.4%). Mean follow up was 10.2 years (range: 0.1 (revision) to 13.1). Implant survival was established with revision as the end point. Harris Hip Scores (HHS), radiographs and metal ion levels were assessed in all patients. Sub-analysis was performed by gender, diagnosis and femoral component size (Small: <50 mm; Large: ≥50 mm).

### Results

Of the 232 patients, 15 were deceased (4 bilateral BHR), 16 lost to follow-up and 9 revised. 205 BHR were evaluated at minimum 10 years postoperatively. Failure modes included 2 component malpositioning, 2 loose femoral heads, 1 fracture, 1 metal sensitivity, 2 impingement and 1 with high metal ions. The overall survival was 95.1% (95% CI: 93.6–96.6) at 12.8 years. The mean HHS was 97.8 (range: 65 – 100). Survivorship in men was 98.6% (95%CI: 97.4–99.8%) at 13 years. Survivorship in women was inferior to men (log rank= 0.003): 87.9% (95%CI: 84.3–91.5%) at 12 years. There was no difference in HHS between genders in the non-revised cases (p= 0.46). There was no difference in survivorship with different pre-operative diagnosis (log-rank = 0.83) but a significant difference in 12-year survivorship between Small (90.1%) and Large components (97.2%) (log rank= 0.01). After adjusting for head size, the difference in survival between males and females was no longer significant (log-rank= 0.125). The median ion levels were Cr:2.0µg/l; Co:1.0µg/l. In 24 patients the ion levels were undetectable. Four patients (1.9%) had ions above the upper acceptable limits of Cr:4.6µg/l;Co:4.0µg/l for unilateral or Cr:7.4µg/l;Co:5.0µg/l for bilateral HRA. In 67 patients with consecutive ion

measurements, levels decreased significantly with time with a mean decrease of 0.97µg/l for Cr and 0.60µg/l for Co.

## Discussion

This study reports the more than 10-year survival of BHR and reflects an experienced specialist's practice, including his learning curve of the procedure. The overall 12.8-year survival was superior to registry reported figures of THA amongst young patients and corresponded well with reports from designer centres.

Survivorship and clinical outcome were excellent in men. In women survivorship was significantly inferior and related to smaller component sizes, but the >10-year clinical outcome in non-revised cases was excellent. In well-functioning BHR, the metal ions decrease significantly with time. The results of this study support the use of HRA with a good design.