

## Lessons learned from early clinical experience and results of 300 ASR® hip resurfacing implantations

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### Abstract:

Between August 2003 and April 2005, 300 ASR® metal-on-metal resurfacing hip endoprotheses were implanted by the first author and a fellow surgeon. The mean age at surgery was 56.8 years (18-75.9 years) and mean body mass index was 27.6 kg/m<sup>2</sup> (range, 19-41 kg/m<sup>2</sup>). The mean follow-up time was 202 days. The mean Harris hip score improved from 44 pre-operatively to 89 at 3 months post-operatively. **In total, eight (2.7 per cent) cases [five neck fractures (1.66 per cent) and three cup revisions (1 per cent)] were revised.** Two neck fractures occurred within a group of seven cases of femoral neck notching detected postoperatively; one neck fracture occurred out of two cases of incomplete seating of the femoral implant. A significantly higher ( $p < 0.001$ ) failure rate was observed for patients who had undergone a previous osteosynthesis of the proximal femur (three revisions in a group of 15 patients). Revision cases had a significantly greater body mass index ( $p = 0.031$ ). A learning curve was evident from the reduction in revisions from 5 in the first 100 surgical procedures to 2 in the next 100 and 1 in the last 100. These results show the importance of accurate surgical technique and careful patient selection for fourth-generation hip resurfacing implants.

**Keywords:** [resurfacing](#); [fourth generation](#); [hip](#); [revision](#); [ASR](#)

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## **Femoral cementing technique for hip resurfacing arthroplasty**

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### **Abstract**

The resurgence of metal-metal bearings has renewed interest in hip resurfacing, but a paucity of information exists regarding femoral cementing technique. We developed a laboratory model in which 72 open-cell foam specimens were used to simulate bone. Analyses of two cement viscosities, two foam porosities, and six cementing techniques were performed: manual cement application only, manual application and filling of one quarter of the component with cement, filling of half of the component, manual application and half component filling, full component filling, and manual application and full component filling. For manual application, cement was pressurized into the foam by rolling the finger tips. For component filling, a defined quantity of cement was poured into the component before pressing it onto the foam. Specimens were cut into quarters, and cement penetration was quantified in seven areas: top, chamfer, wall, interior area, and proximal, medial, and distal stem. The manual technique showed a 3-mm thick, even cement penetration of the outer fixation surface (top =  $26 \pm 0 \text{ mm}^2$ , chamfer =  $14.9 \pm 0.2 \text{ mm}^2$ , wall =  $55.6 \pm 5.2 \text{ mm}^2$ ). None of the other techniques showed a significantly higher penetration in these areas. Large differences were found between all techniques at the medial stem ( $27.7 \pm 17.5 \text{ mm}^2$ ,  $p < 0.001$ ) and the interior area ( $128.5 \pm 69.6 \text{ mm}^2$ ,  $p = 0.013$ ). An increasing degree of penetration occurred from manual cement application to manual application and full component filling. Sixteen specimens showed incomplete seating, which occurred with all techniques except the manual technique. The manual technique consistently gave an approximately 3-mm thick even cement penetration over the outer fixation area. Pouring any cement into the shell resulted in variable degrees of deeper penetration and a risk of incomplete seating, which have been associated with bone necrosis and early fracture. © 2007 Orthopaedic Research Society. Published by Wiley Periodicals, Inc. *J Orthop Res* 25:423-431, 2007

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