

# Incidence of adverse reaction to metal debris after Birmingham hip resurfacing arthroplasty

Mika Junnila<sup>1</sup>, Matti Seppänen<sup>1</sup>, Jari Mokka<sup>1</sup>, Petri Virolainen<sup>1</sup>, Tuukka Pölonen<sup>2</sup>, Tero Vahlberg<sup>2</sup>, Kimmo Mattila<sup>3</sup>, Esa K.J. Tuominen<sup>3</sup>, Juho Rantakokko<sup>1</sup>, Ville Äärimaa<sup>1</sup>, Keijo T. Mäkelä<sup>1</sup>

<sup>1</sup> Department of Orthopaedics and Traumatology, Turku University Hospital

<sup>2</sup> Department of Biostatistics, University of Turku

<sup>3</sup> Department of Radiology, Turku University Hospital

## Background and purpose

The clinical findings of adverse reaction to metal debris (ARMD) following hip resurfacing arthroplasty (HRA) may include peri-articular fluid collections, soft tissue masses, and gluteal muscle necrosis. The Birmingham Hip Resurfacing (BHR) was the most commonly used HRA device at our institution from 2003 to 2012. The aim of the study was to assess the incidence and risk factors for ARMD after the BHR HRA at our unit.

## Methods

32 patients (38 hips) for whom a BHR HRA was performed from April 2004 to March 2007 were scrutinised using MRI, serum chromium and cobalt ion measurements, Oxford hip score questionnaire and clinical examination. The incidence of ARMD was detected and potential risk factors for ARMD occurrence were assessed using univariate regression models.

## Results

The mean follow-up was 6.9 (6.3 to 8.9) years. 6 patients (8 hips) were considered to have a definite ARMD (21 % of all hips). 8 patients (8 hips) were considered to have a probable or possible ARMD. Altogether there were 16 hips with a definite, probable or possible ARMD (42% of all hips). Male gender was significantly associated with ARMD (OR 10.39, 95% CI 1.16-93.29, p=0.04).

## Interpretation

The ARMD incidence of the BHR HRA device is high. However, asymptomatic patients with a small fluid collection seen in MRI and slightly increased serum metal ion levels may not need instant revision surgery. A systematic follow-up of these patients using quantification of metal ion levels, MRI, and symptom questionnaires is advisable.