

# WHAT HAS GONE WRONG WITH ALL-METAL HIP REPLACEMENTS??

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1. Hip Surgery - Primary THR, Resurfacing, Revision THR, Arthroscopic Surgery
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## 1. Background:

- All-metal Cobalt-Chrome hip resurfacing was introduced, initially with the Birmingham Hip™ in 1997. The implant has a large metal socket and large metal head (typically 46-54mm compared to a conventional hip replacement with a 28-32mm head), with a short, small stem (MoM resurfacing). There were good early results, with many pleased, active, mobile young patients.
- Numerous similar devices were then introduced by other manufacturers.
- The principles were then extended, with the same type of all-metal, large-head (articulation) used on a standard type of cemented or uncemented stemmed hip replacement – a metal-on-metal total hip replacement (MoM THR).
- Recent problems have been reported, mostly with the all-metal large-head total hip replacements (MoM THRs) and especially the DePuy ASR™ THR and resurfacing (which I believe were not done in Cambridge).
- If a problem develops, patients report a recurrence of pain, largely around the hip/upper thigh, after a few years, due to a local reaction to the all-metal device, described as 'Metallosis'. Wear of the all-metal articulation causes a high local and systemic concentration of Cobalt and Chromium ions, resulting in local soft tissue and bone damage. Initially this is mild, but can progress to being quite severe, with large bone/soft tissue defects and muscle detachment. Solid or cystic 'tumours' develop in relation to the hip joint and are demonstrated on MRI or ultrasound.
- The problem is greater with MoM THRs than MoM resurfacing
- All-metal THR's with a small articulation (28-32mm heads) are thought to be less of a concern (some were done in Cambridge in the late 1990s and early 2000s).
- The technical terms for the soft tissue reaction are ALVAL = Aseptic Lymphocytic Vasculitis Associated Lesion, or ARMD = Adverse Reaction to Metal Device, but "Metallosis" or "Metal Disease" seems easier!
- Large-head metal-on-metal stemmed hip replacements (MoM THRs) are no longer undertaken in the UK, unless part of an approved trial. MoM resurfacing remains an accepted practice for selected patients.

## 2. Presentation:

Recurrence of hip pain, stiffness, limp, limited movement. Symptoms can be mild, yet soft tissue damage severe in some cases.

## 3. Assessment:

History, Examination, X-rays.

Whole blood metal ion levels for Cobalt and Chromium ions; these are sent via the local hospitals to a trace element lab (often in Guildford) in an EDTA Tube.

X-rays - may show signs of implant loosening and osteolysis.

Metal ion levels – normal range: Cobalt  $\leq$  119nmol (7ppb), Chromium  $\leq$  134nmol (7ppb). Some specialist consider this 'normal range' has been set too high.

#### 4. Mangement.

Do not overlook other causes of hip pain:

- Loose implant
- Fracture
- Infection
- Bursitis
- Impingement, Psoas lesion
- Referred pain.....etc

If Cobalt and Chromium ion levels are raised or rising, or there is un-explained pain, refer to Orthopaedic Clinic for review, investigation and perhaps revision surgery. MRI is used to identify soft tissue tumours, which may be solid or cystic. Revision surgery is considered where there is concern about soft tissue damage, evidence of rising metal ion levels, soft tissue tumours, unexplained pain, loose implants, etc.

**5. Surveillance.** The current guidelines from the MHRA regarding surveillance of all-metal implants, MoM THRs and MoM resurfacing, are:

##### A. Resurfacing

- Annual review for first 5 years
  - Clinical + X-rays
- 5 yearly review thereafter if asymptomatic
- Investigate if symptomatic with Co/Cr levels and MRI, revise or continue follow-up

##### B. Metal-on-Metal THR small head (<36mm head)

- Annual review for first 5 years
  - Clinical + X-rays
- 5 yearly review thereafter if asymptomatic
- Investigate if symptomatic with Co/Cr levels and MRI, revise or continue follow-up

##### C. Metal-on-Metal THR large head ( $\geq$ 36mm head)

- Annual review indefinitely
  - Clinical + X-rays
  - Check Co/Cr levels initially
- Investigate if symptomatic (MRI/US) or metal ion levels rising and then consider revision

##### D. Metal-on-Metal DePuy ASR THR

- Annual review indefinitely
  - Clinical + X-rays
  - Check Co/Cr levels and MRI initially
- If symptomatic, tests abnormal, or metal ion levels rising, consider revision

#### 6. Summary:

- No metal-on-metal THRs at present (unless part of approved trial)
- Metal-on-metal resurfacing – with caution for appropriate patients
- Annual follow-up for large-head MoM THRs
- Annual/5-yearly follow-up MoM resurfacing, more frequent if symptomatic
- Investigate pain with: x-ray, Co/Cr, MRI/US
- If metal ion levels or MRI abnormal, or metal ion levels rising, consider revision

**7. Links:** the following may be helpful:

<http://www.boa.ac.uk/Pages/Welcome.aspx>

<http://www.britishhipsociety.com>

<http://www.mhra.gov.uk/NewsCentre/Pressreleases/CON143784>