

JBJS-Br paper regarding 'pseudotumours' & resurfacing

The July 2008 JBJS-Br edition contains a paper reporting the clinical findings of a group of 20 metal-on-metal resurfaced hips (17 patients) with a mass associated with various symptoms¹. The most common symptom was groin and buttock pain with presentation including spontaneous dislocation, nerve palsy or a noticeable mass or rash. All patients in this series were females and the average time postoperatively at which the patients presented was 17 months (range 0 to 60 months).

The authors have chosen to use the term "pseudotumour" for the identified mass, which is 'neither malignant nor infective in nature' and observed in patients with an average cup inclination angle of 48°, **but with a range 22° - 75°**. (It is important to remember that the definition of 'tumor' is merely an abnormal growth.

Established clinical studies and explant analyses have shown that high cup inclination can result in the femoral head articulating on the edge of the cup (edge loading). The result can be an excessive amount of wear and high metal ion release. It is equally important to note that low cup inclinations can result in cup impingement which in turn may lead to subluxation (dislocation) of the femoral head, also resulting in high wear and metal ion release.

Hart et al concluded that a series of revised painful MoM hips (n=18) was associated with higher than normal wear rates and blood metal ion levels when correlated with findings from the retrieved prosthesis². Additionally, many retrievals from this database were misdiagnosed at time of revision with other causes for swelling or fluid collection including: Infection causing oedema or effusion, adductor tendon tear, soft tissue/component impingement, tissue inflammation or iliopsoas bursa. Before a diagnosis is made for unexplained pain, it is suggested in published literature that non-operative diagnostic tests including CT, ultrasound and hip aspirations should be carried out to ascertain sources of the presented symptoms.

Previously published large patient cohorts of metal on metal resurfacings have shown that the rate of allergic reaction and hypersensitivity is significantly lower than that reported by Gill et al³. It is also important to note there are numerous case reports of **non metal-on-metal hip**

replacements that have cited swelling, granulomatous lesions, cysts and related masses with respect to what the Gill et al refer to as 'pseudotumours'⁴⁻¹⁵.

Mr Derek McMinn, who developed the BIRMINGHAM HIP[®] Resurfacing (BHR) device presented the results of 2,600 BHR operations with 2 to 10 year follow-up at the AAOS 2008. His reported revision diagnoses were as follows:

Revision diagnosis	Number
Femoral head collapse – from pre-existing or subsequently developing AVN	19
Deep infection	11
Femoral neck fracture	10
Dislocation	1
Unexplained pain	1
Nickel sensitivity	1

It can be observed from the above table that only 2 implants out of 2,600 failed due to suspected nickel allergy (revised by McMinn) or unexplained pain (revised by a different surgeon – reason for revision unknown). **In this large cohort the failure rates for unexpected pain and nickel sensitivity was only 0.08%.**

In Australia from 1999-2005, **3,497 BHR operations** were performed by 89 surgeons. Of these operations, 50 were revised for fracture, 12 for malposition of the cup, four for aseptic loosening, two for infection and **one for presumed metal hypersensitivity**¹⁶.

A subsequent follow up of the Australian registry data in 2007 of **6,773 implanted BHR devices** demonstrated a **0.32% revision rate to 'other' causes.**

Revision diagnosis	Revision rate %
Fracture	1.12%
Loosening	0.72%
Other	0.32%
Infection	0.22%
Dislocation	0.09%

The Oswestry database reported 10 year results of 5,001 BIRMINGHAM HIP resurfacing operations performed by 148 surgeons in 37 countries. Of these operations 50 were revised for fracture, 35 for loosening, 6 for dislocation, 12 for infection and 50 due to sepsis, allergic reaction, AVN, impingement or osteolysis¹⁷.

It is important to remember that all total hip replacements have the potential to produce wear debris, and the body may have a response to the particles produced. It is possible that through surgical, technical or clinical variations, low-wear devices may behave adversely resulting in high wear and problems associated with excess debris, including those described by Gill et al.

Glossary of Terms:

Pseudo: Having close resemblance.

Tumour: A mass of tissue formed by a new growth of cells.

Metal sensitivity: An antibody driven hypersensitivity response where the body reacts excessively to metallic substance. Metal sensitivity is a direct contraindication to metal-on-metal implants.

ALVAL: 'Aseptic Lymphocytic Vasculitis and Associated Lesions'. A very rare lymphocytic driven hypersensitivity response to particles produced from metallic implants. Exact incidence is unknown but does not appear to correlate to pre-operative metal sensitivity tests.

Metallosis: Characterised by blackening of the joint from extreme levels metallic particulate.

Osteolysis: Encapsulation and phagocytosis of particulate causing bone degradation.

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