

The London Implant Retrieval Centre

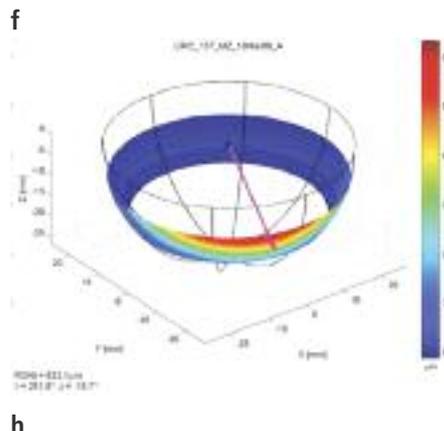
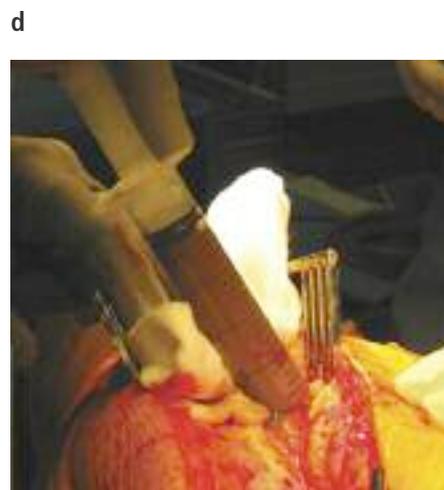
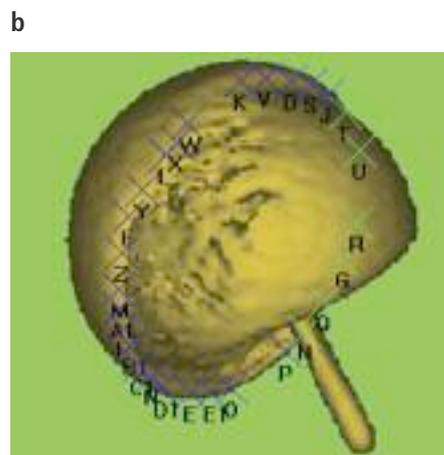
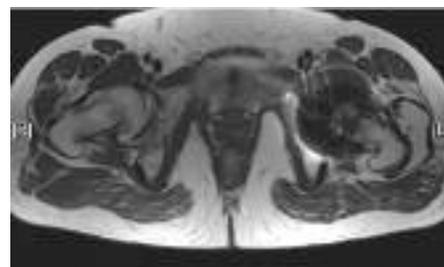
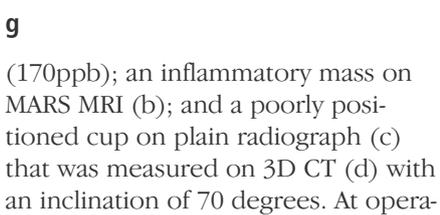
We reported in BON 39 the opening of the LIRC; now, Directors and founders Alister Hart and John Skinner update readers on the status and achievements of the LIRC

The London Implant Retrieval Centre (LIRC) was founded in 2007 with the aim of investigating the mechanism of failure of metal on metal (MOM) hip replacements. In September 2008 a contract was signed to allow funds to be provided by the ABHI (Association of British Healthcare Industries) as an umbrella organization for 8 companies (Stryker, Smith & Nephew, Corin, Finsbury, DePuy, Mathys, Biomet, JRI) and donated via the British Orthopaedic Association.

This enabled the research collaboration between Alister Hart (Imperial College London) and John Skinner (RNOH NHS Trust) to generate reports of analyses of failed MOM hips that would be used by the companies as part of their post marketing surveillance and reporting, where necessary, to the Medicines and Health Regulatory Authority (MHRA).

Seventy-six orthopaedic consultants have contributed over 300 head and/or cup components from 192 failed MOM hips. We are very grateful to these contributing surgeons, who are from 55 UK hospitals. The majority of failed hips were well fixed at the time of revision and did not have an identifiable cause following conventional pre-operative tests (clinical history and examination, plain radiograph, blood CRP). The frequency of manufacturer types is similar to the proportion implanted. All patients have consented to the study and on the majority we have managed to collect the pre revision imaging and whole blood (for metal ion measurement), and intra-operative specimens of capsule tissue in formalin. A typical example is seen in figure 1.

Figure 1. A typical pattern of failure of a current "third" generation MOM hip resurfacing device. The author removed this device (a) because the patient presented with severe pain. She had very high blood Cobalt (330ppb) and Chromium



tion, 50% of her Gluteus Medius muscle was destroyed (e) and the hip contained black fluid (f). Pre-operative aspiration was negative following culture and the CRP was <7. A single stage revision to a ceramic on ceramic THR (g) alleviated the patients symptoms. Post operative microbiology cultures were negative. Analysis of the wear of the component revealed edge loading with a maximum linear wear (h) of 700 microns after 36 months of use (hip simulators predict a wear rate of 2 microns per year).

The protocol for wear analysis of the explanted hips was finalised in May 2009; this followed consultation with all of the companies' engineers. Virtually all of the hips have been notified to the companies as a 'retrieval notification'. Wear analysis has been completed on 50 hips and the full reports are now starting to reach the companies and the surgeons who provided them. The wear analysis records more than 1 million points in 3D for each hip (head and cup) and is repeated 3 times. We have begun laboratory validation with the world leading metrology centre in Huddersfield and the National Physics Laboratory. This has been developed by Richard Underwood and Philippa Cann (before joining the team, Richard completed his PhD in bearing technology at Imperial College).

The measurement of blood metal ions and where possible cup position with 3D CT is according to our published protocols¹. It is imperative that, when performing pre-revision CT, the data is recorded by the radiographer in an extended scale. This allows us to change the density of the image and enable separation of the cup from the head and the bone. For details: www1.imperial.ac.uk/medicine/hip-centre

The data from each explant is used for both post-marketing surveillance and research. The MHRA have published guidelines on the reporting of explanted hips². Once completed, copies will be sent to contributing surgeons. For the 2010 American Acad-

emy of Orthopaedic Surgeons we have submitted abstracts on subjects including:

1. the effect of CT measured cup angle on wear rates
2. the relationship between blood metal ion levels and wear rates.
3. the comparison of wear rates of failed MOM hips with simulator test predictions

Further work will be submitted to the British Hip Society meeting in Sheffield in 2010.

We have invited all contributing surgeons and companies to our first anniversary meeting on Wednesday 30 September at Imperial College London. We will present interesting cases, explain our methodologies and show some early results. Those wishing to attend please notify Alister or John.

The ongoing drive of the project remains the need to establish why some people react to metal bearings so dramatically and why for many it is a successful bearing and unsatisfactory for others. This remains the clinical

imperative.

Coordinator: Gwynneth Lloyd

Steering Committee: Prof Justin Cobb,

Sarah Muirhead-Allwood,

Martyn Porter

Engineers: Dr Philippa Cann,

Dr Richard Underwood

Clinical chemistry: Dr Barry Sampson

Radiology: Dr Adam Mitchell,

Johann Henckel

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www1.imperial.ac.uk/medicine/about/divisions/sora/biosurg/musculo/retrieval/

References

1. **Hart AJ, Sabah S, Henckel J, Lewis A, Cobb J, Sampson B, Mitchell A, Skinner JA.** The painful metal-on-metal hip resurfacing. *J Bone Joint Surg Br* 2009;91-B:6:738-44.
2. **MHRA.** What to report. Vol. 2009, <http://www.mhra.gov.uk/Safetyinformation/Healthcareproviders/Orthopaedics/MedicaldevicesWhattoreport/index.htm>

Fellowships and Awards

A reminder that applications are due by 31 December:

Travelling Fellowships	BOA	[2 x £5,000]
	Zimmer	[1 x £3,000]
	European	[2 x £1,500]
Soli Lam Spinal Fellowship		[1 x £15,000]
EFORT Travelling Fellowship		itinerary to be announced
Robert Jones Prize		Gold medal and £500 for an essay

Contact Celia Jones (c.jones@boa.ac.uk)

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