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CORR Insights®: Revision of Metal-on-metal Hip Prostheses Results in Marked Reduction of Blood Cobalt and Chromium Ion Concentrations

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Where Are We Now?

A limited number of relatively small studies are available detailing the outcome of hip revision surgeries after metal-on-metal

This CORR Insights® is a commentary on the article “Revision of Metal-on-Metal Hip Prostheses Results in Marked Reduction of Blood Cobalt and Chromium Ion Concentrations” by Lainiala and colleagues available at: DOI: 10.1007/s11999-015-4156-6.

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(MoM) resurfacing hip arthroplasty or THA. General recommendations and opinions issued by national and international notifying bodies [3] and scientific committees throughout the world [2] frequently orient towards the individual benefit-to-risk ratio in guiding the decision of an orthopaedic surgeon who treats a particular patient. But the uncertainty and the scarcely available evidence limit the capacity of orthopaedic surgeons to appropriately decide on the management of patients with revised MoM hip implants. This is why the analysis of a large series is so important at the current state of knowledge.

With this in mind, Lainiala et al. [1] studied 215 revised hips in 198

patients and confirmed that whole blood ion levels of cobalt decreased under the widely-used seven parts per billion threshold in unilateral cases after revision. This was not confirmed in a few patients for blood ion levels of chromium (Cr), where the revision procedure is not entirely effective to relieve some patients from this metal ion. Similarly, pain clearly decreased after revision surgery. However, at 1-year followup, pain was still present in 16% of patients with unilateral, revised THA, and also in 27% of patients who underwent a unilateral revised resurfacing hip arthroplasty [1]. These data support the need for careful followup of revised patients, especially those with high Cr ions in blood and those reporting pain.

Where Do We Need To Go?

While the current paper [1] helps clarify some of the therapeutic effects of revision surgery after MoM hip

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arthroplasties, controversies remain about the predictive value and meaning of metal ion levels, particularly with Cr. Additionally, we are still missing clear recommendations for bilateral MoM hip arthroplasties after unilateral revision. While local adverse effects (such as impaired bone fixation of the new implants after revision) seem low in the short-term (1 year after revision), it is also unclear whether other complications may occur or how these new implants will perform in the mid- and long-term, compared with revision for other causes. The eventual systemic effects of high metal ion levels may not progress if these levels are found to decrease after revision. However, evidence of this safety issue is not available either. Gaps in knowledge regarding the clinical relevance of metal ion levels before and after revision surgery remain. There also remains a gap in knowledge regarding the frequency and relevance of local and systemic adverse effects of revision surgery, as well as on the clinical management of the patient population—from diagnosis to surgical decisions and approaches.

How Do We Get There?

A high-quality, large retrospective series like the current study may help to clarify some important issues, particularly the clinical outcome of these patients and the influence of surgical timing and techniques that can benefit them. Subgroup analysis, when enough cases are available, may further deepen in specific patient needs (rerevisions, residual, and recurrent pseudotumors, or other). Comparative studies could possibly offer better insight to facilitate the decisions that surgeons face. Revision surgery after different MoM designs, or patient cohorts with ultra-high versus moderate metal ions levels might be meaningful. Additionally, registries are major tools that could help compare survivorship, failure, and complications to the outcome of hip revisions after MoM arthroplasty. However, appropriate testing models and methods may be also required to elicit the pathomechanics, toxicology, and pathophysiology of the complex local and systemic interaction of metal compounds within the patient. Finally, new data supported by

sufficient evidence needs appropriate communication and translation into updated recommendations to surgeons and patients.

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