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CORR Insights®: Early Lessons From a Worldwide, Multicenter, Followup Study of the Recalled Articular Surface Replacement Hip System

Jean-Noel A. Argenson MD, PhD

Where Are We Now?

The development of adverse local tissue reactions (ALTRs) in patients implanted with metal-on-metal (MoM) bearing sur-

faces for hip arthroplasty may cause early failure or silent progression of the destructive reaction, making revision even more complex. Because of this early revision rate, the Articular Surface Replacement (ASR) system (DePuy Orthopaedics, Warsaw, IN, USA), both for resurfacing and for THA, was recalled in 2010 after 6 years of commercial use [6].

This raises a few interesting questions: How do we screen nonrevised patients in order to detect ALTRs? Should we treat such lesions by revision based on risk stratification, as recently proposed in the consensus statement of American Academy of Orthopaedic Surgeons, American Association of Hip and Knee Surgeons, and the Hip Society [4]? This screening currently includes a combi-

nation of cross-sectional imaging, patient symptomatology and/or reported outcome, and metal ions level. The location and severity of ALTRs are important factors to be considered, as well as the interrelation with the patient outcomes.

In their current study, Malchau and colleagues examined the location of ALTRs, their severity, and the clinical consequences of using metal artifact reduction MRI and patient reported outcome scores on 288 individuals evaluated at a mean time of 6 years of either resurfacing or THA ASR. Nearly one-fourth of the nonrevised patients showed signs of moderate or severe ALTRs (pseudotumors), although they could not intraoperatively confirm this finding. Nevertheless, this incidence should be considered valid since all of the revised ASR implants showed solid pseudotumors on cross-sectional imaging, with MRI as the primary imaging modality [5].

Malchau and colleagues assessed patient MRIs for the presence and

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location of ALTRs (anterior, posterior, or on both sides of the hip in axial images). However, the study authors did not examine patient MRIs for elevated metal ion levels. This is interesting because a previously published study [3] found a correlation between the presence of pseudotumors on MRI and elevated metal ion levels. On the other hand, a recently published study [1] did not find a close correlation between ion levels and the presence of pseudotumors.

Where Do We Need To Go?

The current study describes a clear relation between the location of ALTRs and surgical approach, which could have an impact on onset of symptoms either by neurovascular effect or abductor damage; this may also play a role at the time of revision planning for evaluating the best soft tissue preserving approach according to surgeon practice.

The location and severity of ALTRs found in the present study deal with one single design, therefore, the results may not be generalized to all MoM hip arthroplasty designs. Because ALTRs may lead to catastrophic joint damage, it will be important to get a better understanding of the mechanism producing this adverse reaction in a

variety of implants, as well as identify which patients may be experiencing ALTR, specifically if they are asymptomatic. A number of questions also remain regarding imaging: Which approach, ultrasound or MRI, affords the best balance of sensitivity, specificity, and cost-effectiveness? We know from this study and others [2, 7] that validated outcomes scores sometimes stay the same whether or not ALTR is present. Therefore, what is the best approach to using validated outcomes scores in patient assessment for this problem?

How Do We Get There?

Answering these questions will require large cohort studies with patients who were treated similarly, screened using the same methodological tools, and received the same implant. The authors of the present study do have the potential to drive such a study with the specific implant evaluated since, as of this writing, only 288 of the 1258 patients have been evaluated under their protocol. The involvement of the three other centers provide the possibility of using metal artifact reduction sequence protocol MRI, and will lead into a true worldwide multicenter prospective followup study. This contribution will be helpful, not only for

the specific implant evaluated in the present study, but for all MoM bearing surfaces for hip arthroplasty, which may develop ALTRs.

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