Outcome of Failed Hip Resurfacing Revised to THR Depends on Revision Indication.
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INTRODUCTION
Metal-on-metal Hip Resurfacing Arthroplasty (MoMHRA) has gained popularity due to its perceived advantages of bone conservation and relative ease of revision to a conventional total hip replacement (THR) if it fails.

Known complications associated with MoMHRA include femoral neck fracture [1], avascular necrosis and/or collapse of the femoral head and neck [2], aseptic component loosening [3], and femoral impingement [4]. Another recognised class of complications are soft tissue responses to cobalt chrome implants such as ALVAL [5] (aseptic lymphocytic vasculitis associated lesions) and pseudotumours [6]. These may be due to metal hypersensitivity or reaction to metallic debris [6].

This study’s aim was to assess the functional outcome of failed MoMHRA revised to THR and compare it with a matched cohort of primary THRs.

METHOD
We have revised 53 MoMHRA cases to THR; the reasons for revision were femoral neck fracture (Fracture Group, n=21), soft tissue reaction (Pseudotumour Group, n=16) and other causes (Other Group, n=16: loosening, avascular necrosis and infection). Average follow-up was 2.9 years.

These MoMHRA revisions were compared with matched controls from a primary THR cohort (Exeter THR, Stryker, Newbury, UK), these were matched for age, gender and length of follow-up. We aimed to get a 2:1 ratio of controls to revised MoMHRA cases, we were able to find 41 controls for the Fracture Group, 32 controls for the Pseudotumour Group and 30 controls for the Other Group.

We compared, using the Mann-Whitney U test, operative time (OT, measured in minutes), and outcome using the Oxford Hip Score (OHS, 12 is best score, 60 is worst score) between the revised MoMHRA groups and their individual controls. We also compared, using the Kruskal Wallis test, activity levels in the revised MoMHRA groups using the UCLA Activity Score (10 is highest activity level, 0 is lowest).

RESULTS
There were no differences between the Fracture Group (mean OT 99.6, SD: 30.4; mean OHS 19.8, SD:9.2) and its controls (mean OT 95.9, SD: 31.8; mean OHS 17.3, SD: 7.5) and between the Other Group (mean OT 129.4, SD: 36.7; mean OHS 22.2, SD: 9.4) and its controls (mean OT 104.4, SD: 39.2; mean OHS 20.3, SD: 10.1) in terms of OT and OHS.

The Pseudotumour Group had significantly longer OT (mean 161.6, SD: 24.5, p<0.001) and worse outcome (mean OHS 39.1, SD: 9.3, p<0.001) than its controls (mean OT 113.1, SD: 51.7; mean OHS 20.0, SD: 9.2) (Figure 1).

DISCUSSION
The results demonstrate that outcome after revision of MoMHRA is dependent upon the indication for revision. Specifically, patients who were revised for soft-tissue reactions had significantly worse outcome than primary THR patients. We found no difference in outcome between revised MoMHRA and primary THR for other revision indications. Patients who suffer soft tissue reactions are more likely to experience complications and require further surgical intervention. The pseudotumour associated revisions were associated with a significantly prolonged intra-operative time and more transfusions when compared to primary THR controls.

The overall complication rate was quite high, with 11 (21%) revised MoMHRA cases experiencing some form of complication. The Pseudotumour Group had a considerably higher complication rate with 37% having a complication.

Revision of failed MoMHRA is associated with more complications than primary total hip replacement. In addition, the revisions secondary to pseudotumour had significantly worse functional outcome when compared to other indications for MoMHRA revision or primary THR.

REFERENCES

Figure 1: Outcome measured using Oxford Hip Score for all groups.

Figure 2: Activity scores for revised MoMHRA groups.