



Paper #52

Cobalt to Chromium Ratio is Not a Key Marker for Adverse Local Tissue Reaction in Metal on Metal Hips

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Introduction: Metal-on-metal (MoM) implants have been used extensively in the last decade with the hope of decreasing prosthetic instability and osteolysis in conventional metal-on-polyethylene (MoP) hips. Unfortunately, MoM bearings have performed inconsistently and some patients develop adverse local tissue reaction (ALTR). Attempts to diagnose ALTR have been difficult. Currently, there is no biomarker that is specific for ALTR. The presence of pain, elevated ion levels, and cross sectional imaging is used in concert to determine the need for revision. It has been suggested that the ratio of cobalt (Co) to chromium (Cr) ions may be predictive of bearing malfunction and ALTR. We asked whether the ratio of Co to Cr can be used as a predictor for periarticular ALTR in MoM hips.

Methods: 89 MoM patients underwent revision for bearing related problems. All patients had prerevision ion levels and clinical grading of ALTR, intraoperatively using the Griffin et al. tissue damage scale and the Co and Cr ratio was calculated. A Spearman correlation coefficient was utilized to determine the correlation between ALTR and the Co to Cr ratio.

Results: The average Co level was 23.28 (0 to 236) and the average Cr level was 9.02 (0 to 112). The average Co to Cr ratio was 2.96 (0 to 20). Tissue grades of the 89 patients were as follows: 23 grade 0, 38 grade 1, 19 grade 2 and 9 grade 3. There was no correlation ($r=.095$; $p=.41$) between ALTR and the Co to Cr ratio.

Conclusion: In this series, the Co to Cr ratio is not a predictive biomarker for MoM bearing malfunction or ALTR. A need continues for a predictive marker for necrosis in the evaluation of metal-on-metal bearings.
