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TAPER WEAR CONTRIBUTES ONLY A THIRD OF THE TOTAL VOLUMETRIC MATERIAL LOSS IN LARGE HEAD METAL ON METAL HIP REPLACEMENT

A.J. Hart, A.K. Matthies, R. Racasan, P. Bills, A. Panagiotidou, L. Blunt, G. Blunn, J. Skinner

Abstract

It has been speculated that high wear at the head-stem taper may contribute to the high failure rates reported for stemmed large head metal-on-metal (LH-MOM) hips. In this study of 53 retrieved LH-MOM hip replacements, we sought to determine the relative contributions of the bearing and taper surfaces to the total wear volume. Prior to revision, we recorded the relevant clinical variables, including whole blood cobalt and chromium levels. Volumetric wear of the bearing surfaces was measured using a coordinate measuring machine and of the taper surfaces using a roundness measuring machine. The mean taper wear volume was lower than the combined bearing surface wear volume ($p = 0.015$). On average the taper contributed 32.9% of the total wear volume, and in only 28% cases was the taper wear volume greater than the bearing surface wear volume. Despite contributing less to the total material loss than the bearing surfaces, the head-stem taper junction remains an important source of implant-derived wear debris. Furthermore, material loss at the taper is likely to involve

corrosion and it is possible that the material released may be more biologically active than that from the bearing surface.