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Summary: We found that 36mm metal-on-metal hips have similar corrosion and taper material loss as larger diameter hips. This supports their classification as large diameter hips.

Title: 36mm Metal-on-Metal Hips have Similar Taper Material Loss Rates as Larger Diameter Hips from the Same Manufacturer

Introduction: There is a two-fold difference in failure rate between the two most commonly used metal-on-metal (MOM) bearing types in the US. We compared these two bearing types; one with a 36mm diameter with a modular cup and one with a diameter >36mm with a monoblock cup.

Methods: This was a retrospective study involving 60 retrieved LD-MOM-THR hips of 2 different cobalt-chromium bearing designs (n=30 in each group) from a single manufacturer that had been paired with a single cementless titanium 12/14 stem design from the same manufacturer (Table 1). One group consisted of a monoblock cup whilst the other had a modular cup design with separate metal shell and liner components. Paired t-tests revealed that the two groups were statistically matched in relation to patient age, gender and time to revision. We used a well-published scoring method to visually assess the severity of corrosion at each head taper surface on a scale of 1 (none) to 4 (severe). We then used a roundness-measuring machine to measure the volume of material loss at the taper surfaces. The statistical significance of any differences between the two hip designs in relation to corrosion scores and material loss were then evaluated.

Results: We found that 93% (n=28 in each group) of the tapers showed evidence of corrosion, however there was no significant difference between the two groups (p=0.61). The monoblock cup group had a median taper material loss rate of 0.397 mm^3/year (0-4.198) and the material loss of the modular cup group was 0.216 mm^3/year (0-3.117). There was no significant difference between the two groups (p=0.132).

Discussion and Conclusion: We found corrosion and material loss rates for the tapers of 36mm hips to be comparable to larger diameter hips from the same manufacturer. This supports the classification of 36mm hips as large diameter.

Bearing Material	CoCr	CoCr
Stem Design and Material	12/14 Titanium	12/14 Titanium
Head Size (mm)	47 (35-54)	36 (36-40)
Gender (Male : Female)	13:17	15:15
Age at Primary Surgery (years)	57 (43-78)	62.5 (26-73)
Time to Revision (months)	38.5 (7-74)	52.5 (10-770
Whole Blood Cobalt (ppb)	11.54 (0.6-167)	4.25 (0.6-130)
Whole Blood Chromium (ppb)	7.28 (0.2-66)	3 (0.6-42.4)

Table 1: Implant and patient data