

Mortality rates at 10 years after metal-on-metal hip resurfacing compared with total hip replacement in England

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STUDY QUESTION How do 10 year mortality rates compare between patients undergoing metal-on-metal (MoM) hip resurfacing and those undergoing total hip replacement in England?

SUMMARY ANSWER Patients in England with hip osteoarthritis who underwent MoM hip resurfacing between 1999 and 2012 have reduced long term mortality compared with those who underwent cemented and uncemented THR.

PARTICIPANTS AND SETTING

The English hospital episode statistics database linked to mortality records from the Office for National Statistics was used to include all adults undergoing primary hip replacement between 1999 and 2012.

PRIMARY OUTCOME

The primary outcome was all cause mortality. Propensity score matching was used to minimise confounding by indication. Kaplan-Meier plots estimated the probability of survival up to 10 years after surgery. Multilevel Cox regression modelling, stratified on matched sets, described the association between prosthesis type and time to death, accounting for variation across hospital trusts.

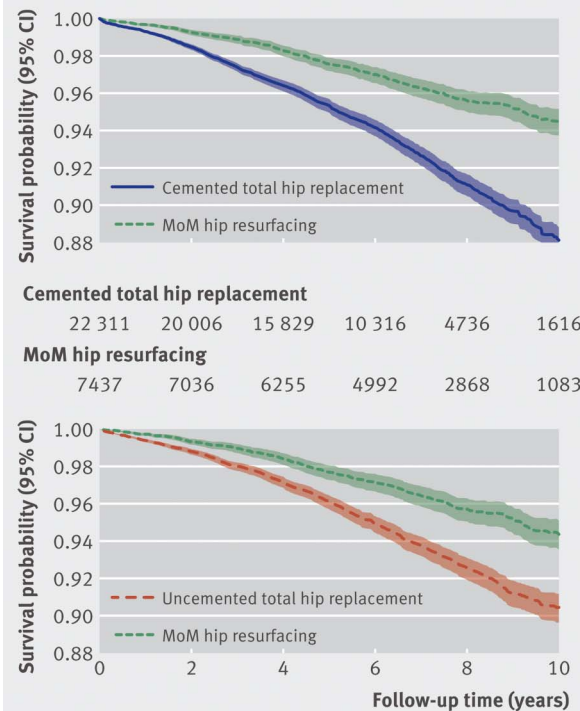
MAIN RESULTS

We matched 7437 patients who underwent MoM hip resurfacing to 22 311 who underwent cemented total hip replacement, and 8101 who underwent MoM hip resurfacing to 24 303 who underwent uncemented total hip replacement. Cumulative mortality rates at 10 years were 271 (3.6%) for MoM hip resurfacing versus 1363 (6.1%) for cemented total hip replacement, and 239 (3.0%) for MoM hip resurfacing versus 999 (4.1%) for uncemented total hip replacement. Patients undergoing MoM hip resurfacing had an increased survival probability (hazard ratio 0.51 (95% confidence interval 0.45 to 0.59) versus cemented hip replacement; and 0.55 (0.47 to 0.65) versus uncemented hip replacement). There was no evidence for an interaction with age or sex.

BIAS, CONFOUNDING, AND OTHER REASONS FOR CAUTION

Propensity score matching on known measurable confounders—including age, sex, Charlson comorbidity index, socioeconomic status, surgical volume, and time of operation—accounted for confounding by indication. But residual confounding could remain owing to the limited scope of known, measured confounders or to further unknown confounders. For these reasons, Rosenbaum bounds sensitivity analyses were performed to estimate the likelihood that an unknown or immeasurable confounder could explain the observed differences in long term mortality. With γ values of 1.7 for MoM hip resurfacing versus cemented total hip replacement and 1.4 for MoM hip resurfacing versus uncemented total hip replacement, unaccounted confounding is unlikely but could remain.

Kaplan Meier survival curves at 10 years by type of operation after matching

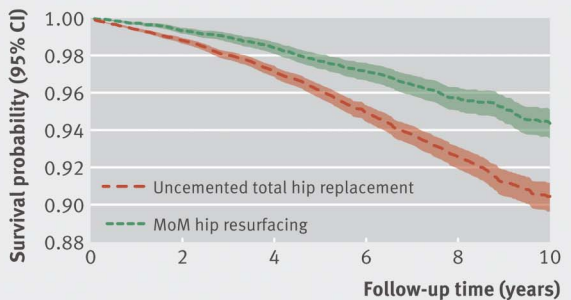


Cemented total hip replacement

22 311	20 006	15 829	10 316	4736	1616
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MoM hip resurfacing

7437	7036	6255	4992	2868	1083
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Uncemented total hip replacement

24 303	20 953	14 354	7563	3085	1173
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MoM hip resurfacing

8101	7281	5710	3848	2013	886
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GENERALISABILITY TO OTHER POPULATIONS

The study results apply to matched populations, which exclude patients who are very old and have had complex total hip replacements. MoM hip resurfacing was developed for young, active patients who were likely to need several total hip replacements of increasing complexity during their lifetime. Including a higher proportion of younger patients in the total hip replacement groups arguably allows a clinically relevant comparison of their outcomes against similar patients undergoing MoM hip resurfacing.

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