

Survivorship of Cemented versus Cementless Metal-on-Metal Hip Resurfacing: A Match-Cohort Analysis at Minimum Five Years

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INTRODUCTION: Although adverse local tissue reactions remain a concern after metal-on-metal hip resurfacing (MoM HR), the most common causes of failure remain femoral neck fracture and aseptic loosening of the femoral component. Cementless femoral fixation was introduced to limit these mechanisms of failure. The purpose of the current study was to compare the survivorship of cemented and cementless femoral fixation metal on metal hip resurfacing at a minimum five years of follow-up.

METHODS: Five-hundred ninety patients MoM HR done through the Hueter-anterior approach with a minimum five years (mean age 50 years, BMI 29, 555 males and 35 females) follow-up were retrieved from the Institutional database. One hundred and forty-three cementless (mean age 50 years, mean BMI 29, 136 males and 7 females) and 143 cemented MoM HR (mean age 52 years, mean BMI 29, 136 males and 7 females) were matched on age, sex and BMI. Overall failures, femoral failures, adverse events, and complication were assessed. Acetabular cup inclination, neck-shaft angle (NSA), stem-shaft angles (SSA), Δ NSA-SSA, neck narrowing, femoral and acetabular osteolysis were recorded. Correlation between radiological parameters and implant survivorship or adverse events was investigated.

RESULTS SECTION. The overall survivorship of both the cemented and cementless implants was 91% at a mean follow-up of 8.2 years (range 5 - 19). There were 14 failures (10% rate) in the cemented group and 12 failures (8% failure rate) in the cementless group ($p > 0.05$). Comparing males' and females' survivorship rate, at the mean follow-up of 8.2 years the survivorship for both cementless and cemented groups was 92.7% for males and 74.9% for females ($p=0.019$). In the male group, using isolated femoral reasons for revision as endpoints the survivorship was 96.5% for the cemented group and 98% for the cementless group ($p > 0.05$). A neck narrowing greater than 10% was present in 11 patients (8%) in the cemented group and in 3 patients (2%) in the cementless group ($p < 0.01$). No significant correlation was found between any radiological parameter and the risk of failure.

DISCUSSION: In this matched cohort, overall survivorship was high and similar between cemented and cementless MoM HR at mid-term follow-up. The pronounced sex effect—with significantly lower survivorship in females—aligns with prior experience and supports careful selection in women. Among males, survivorship for femoral causes of revision exceeded 96% in both groups, while cementless fixation showed a lower incidence of femoral neck narrowing ($>10\%$), suggesting a potential biological advantage at the bone-implant interface. The absence of correlations between measured radiographic parameters and failure indicates that factors beyond alignment metrics may drive failure risk. Strengths include matched groups on key covariates; limitations include the retrospective database design, potential residual confounding, and generalizability beyond the Hueter-anterior approach.

SIGNIFICANCE/CLINICAL RELEVANCE: At ≥ 5 years, cementless and cemented metal on metal hip resurfacing show excellent survivorship in males, with cementless fixation demonstrating a lower incidence of femoral neck narrowing. The significantly lower survivorship in females supports cautious indications and closer follow-up when considering metal on metal resurfacing in women.