

Outcomes of Isolated Modular Component Exchange in Aseptic Revision Total Hip Arthroplasty: 10-Year Outcomes and Risk Factors Associated for Re-Revision

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INTRODUCTION: In patients requiring aseptic revision total hip arthroplasty (rTHA), isolated modular exchange (acetabular liner and femoral head) is an appealing and less invasive option when compared to revision of well-fixed components. However, modular exchange has historically been associated with a higher revision rate and there is limited modern data regarding which indications are best suited to this strategy or risk factors for failure. The aim of this study was to assess the 10-year survivorship of isolated modular component exchange for the first aseptic rTHA and identify patient and surgical factors associated with failure.

METHODS:

A retrospective review of the prospectively maintained database from our tertiary referral centre was performed to identify 481 patients that underwent aseptic rTHA involving isolated modular component exchange during the study period (2000 to 2022). Of these, 266 (55.3%) were a first-time revision procedure and met the inclusion criteria for the current study. We excluded cases involving femoral stem or acetabular shell exchange, re-revision procedures, septic indications and/or oncology reconstructions. The patient median age at revision was 67 years (inter-quartile range (IQR) 57-76), 140 (52.6%) were female, and the median body mass index (BMI) was 27.7 (IQR 24.67-31.7). The mean study follow-up was 11.1 years (range of 2 to 22) and there were 73 (28.1%) deaths during the study period. The main indications for rTHA in the cohort were recurrent hip instability (n=107, 40.2%), polyethylene wear with or without osteolysis (n=108, 40.6%), metal on metal (MoM) reaction with or without pseudotumour (n=41, 15.4%), and pain/other (n=10, 3.8%). The primary outcome was re-revision for any-cause. Re-revision was defined as addition or exchange of implants. Implant survivorship at 10 years was calculated using Kaplan-Meier estimates with 95% confidence intervals (CI). Multivariable Cox proportional hazard regression modelling was used to assess variables associated with 10-year survival and are reported as hazard ratios (HR) with 95% CI.

RESULTS: A total of 60 (22.6%) hips underwent at least one re-revision. The indications for re-revision were recurrent instability (n=42, 70.0%), periprosthetic joint infection (n=6, 10.0%), periprosthetic fracture (n=5, 8.3%), loosening (n=4, 6.7%), and MoM reaction with or without pseudotumour formation (n=3, 5.0%). Ten-year survivorship was 77.8% (95%CI 72.4-83.3) with all-cause re-revision as the endpoint (Figure 1). The ten-year survivorship estimates were significantly different depending on the underlying indication (p=0.02). Younger age (p=0.008), elevated BMI (p=0.006) and the indications instability and pain / other (p=0.017) were significantly associated with revision on univariate analyses. However, on multivariate analyses only younger age at surgery (HR 0.58, 95%CI 0.39-0.88, p=0.01) and pain as an indication for surgery (HR 2.9, 95% CI 1.1-7.9, p=0.02) risk factors for re-revision.

DISCUSSION AND CONCLUSION:

Isolated modular component exchange during aseptic rTHA has a high 10-year rate of failure, most often due to instability. The indications instability and pain had the highest rates of re-revision. Younger age and pain indication were independently associated with increased risk of all-cause re-revision. These findings may help inform patient counselling in the setting of revision THA for instability.

