

Stem Material and Taper Design are Risk Factors for Failure in Revision Total Hip Arthroplasty when New Metal Heads are Placed on a Retained Femoral Stem

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INTRODUCTION: Failure due to trunnionosis has been reported with cobalt-chrome (CoCr) heads in total hip arthroplasty (THA). However, there is limited data on the use of these heads in the revision setting. We sought to analyze the outcomes of patients who underwent revision THA with retained femoral component and received a CoCr femoral head on a used trunnion.

METHODS: We retrospectively reviewed 107 revision THAs implanted with a V40 taper CoCr femoral head between February 2006 and March 2019 and compared these to 90 revision THAs with a C-taper CoCr femoral head between May 2013 and June 2022. All patients had a retained femoral component. Demographics, implant details, and postoperative complications, including need for repeat revision, were recorded.

RESULTS: Patients were more likely to undergo a repeat revision if they were implanted with a titanium–molybdenum–zirconium–iron (TMZF) stem compared to a titanium stem (OR=3.3, 95% CI=1.4-7.7). A multivariable regression showed that a V40 head was a risk factor for undergoing a repeat revision compared to a C-taper head (OR=3.0, 95% CI=1.02-9.0), but not age, gender, body mass index (BMI), American Society of Anesthesiologists (ASA) score, head size, head offset, cemented compared to a uncemented femoral stem, number of components revised, or metallosis during initial revision. After excluding the 67 patients with TMZF stems, V40 taper (OR=6.3, 95% CI=1.2-34.8) and younger age (OR=0.9, 95% CI=0.9-0.98) were risk factors for reoperation, but not gender, BMI, ASA, head size, head offset, or femoral stem material.

DISCUSSION AND CONCLUSION: Both TMZF femoral stem and V40 taper CoCr femoral heads increase the risk of reoperation during revision THA with a retained femoral component. Therefore, we urge caution with using a CoCr femoral head on a retained trunnion.