The Modular Cup-in-Cup Technique in Revision Total Hip Arthroplasty

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INTRODUCTION: The modular cup-in-cup technique, involving cementing a modular acetabular component into a highly porous monoblock tantalum revision shell, provides surgeons the flexibility to exchange the articulation if subsequent re-revision is required. This study seeks to characterize the outcomes of this novel technique.

METHODS: A single-center retrospective review was performed of all patients who underwent revision THA utilizing a modular acetabular component cemented into a monoblock trabecular metal revision shell. Patient demographics, comorbidities, operative characteristics, and postoperative outcomes were assessed. Preoperative and postoperative radiographs were assessed to quantify bone loss, cup position, and aseptic loosening. All-cause revision, revision for aseptic loosening, and revision for instability were estimated using the Kaplan-Meier method.

RESULTS: Seventeen hips were identified with an average age of 65.6 years and a mean follow-up of 447.9 days. The most common preoperative indication for revision was aseptic loosening (82.4%). Preoperatively, 9 (52.9%) hips had Paprosky 3A defects, 5 (29.4%) had Paprosky 3B, 2 (11.7%) had Paprosky 2C defects, and 1 (5.9%) had a Paprosky 2A defect. Average inclination and anteversion of the outer cup were 49.2±8.7° and 15.5±8.0°, respectively. Average inclination and anteversion of the inner cup were 44.8±7.2° and 18.4±7.6°, respectively. In total, 3 (17.7%) patients underwent reoperation, 2 (11.8%) for instability and 1 (5.8%) for irrigation and debridement. Both patients revised for instability were converted from a modular dual mobility articulation to a constrained liner. No patients underwent revision for aseptic loosening or demonstrated radiographic loosening at final follow-up. Estimated 3-year survivorships for all-cause revision and instability were 80.4% (95% confidence interval (CI): 62.7%-100%) and 86.7% (95% CI: 71.1%-100%), respectively.

DISCUSSION AND CONCLUSION: The modular cup-in-cup technique is a viable option for patients undergoing revision THA at increased risk of instability. This technique gives surgeons the flexibility to exchange the articulation if additional surgery is required for instability.