

Short-Term Outcomes of Metaphyseal Cones and Stem Fixation following Rotating Hinge Revision Total Knee Arthroplasty

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INTRODUCTION: Although hinge components are used with success in complex revision total knee arthroplasty (TKA), concerns exist regarding aseptic loosening with high stress across the prosthesis. The use of metaphyseal cones and hybrid cement fixation have been studied in unlinked constrained revision TKA, but whether they result in lower failure rates with a hinge has yet to be addressed in the literature. The purpose of this study was to determine whether the use of cones or cement technique had an impact on the rate of failure following rotating hinge revision TKA.

METHODS: We identified a consecutive series of 169 hinged prostheses implanted between 2011-2022. We reviewed radiographs and medical records to compare demographics, comorbidities, indication, complications, and rerevision in patients with and without cones and fully cemented versus hybrid stems. A multivariate analysis was performed to identify the independent association of cones and stem fixation with rerevision as the primary endpoint.

RESULTS: At a mean follow up of 3.46 ± 2.2 years, 43 patients underwent rerevision (25%) most commonly for infection (12%) and mechanical failure (11%). Of the total cohort, 73 patients (43%) had metaphyseal cones, while 85 patients (50%) had hybrid stems. Patients with fully cemented stems and cones had the lowest rerevision rates compared to hybrid with cones and hybrid or cemented without cones (7% vs. 32% vs. 19% vs. 18%, $p=0.027$). Although cones were not significant in multivariate analysis, hybrid fixation (OR=2.54, $p=0.032$) was an independent risk factor for failure compared to cemented stems.

DISCUSSION AND CONCLUSION: Patients undergoing revision TKA with a rotating hinge prosthesis have high failure rates, with fully cemented stems outperforming hybrid fixation. Although the use of metaphyseal cones had no difference overall, a construct with a fully cemented stem and cone has the lowest rate of failure in rotating hinge revision TKA.