

Is Zone 2 Cementless Fixation Better than Hybrid Fixation in Revision Total Knee Arthroplasty with Moderate Bone Loss? An Intermediate-Term Data Analysis

Patrick Moody¹, Mark Joseph Heidenreich², Lyndsay Somerville³, James L Howard⁴, Douglas Naudie⁵, Richard W McCalden³, Steven J MacDonald⁶, Brent Lanting⁴, Edward Vasarhelyi⁴

¹Western University & Affiliated Clinical Teaching, ²Mayo Clinic, ³London Health Sciences Centre, ⁴LHSC - University Hospital, ⁵University Campus, ⁶LHSC UH

INTRODUCTION:

Bone loss remains an anticipated challenge in revision total knee arthroplasty (TKA). Recent efforts to enhance revision TKA fixation and stability have focused on metaphyseal implants, namely cones and sleeves. Adaptation of such implants continues to grow in the setting of consistently supportive emerging data. However, hybrid fixation with press-fit stems and cemented metaphyseal fixation has previously demonstrated excellent survival out to 5 years at our institution, with considerably less costs. The primary goal of this study was to determine if there is a difference in intermediate-term survival between revision TKA performed with zone 2 cementless fixation versus hybrid fixation in patients with moderate tibial and/or femoral bone loss (AORI 2). A secondary goal of the study was to determine whether patient-reported outcome measures (PROMs) differ between the groups. We hypothesized that there would be no difference in survival or PROM between the groups.

METHODS: A retrospective review based on a prospective institutional database was performed to identify all patients between 2012 to 2017 who underwent revision TKA. Thus, all patients included were between 5 and 10 years postoperative. Patients were included if they had at least femoral or tibial bone loss meeting AORI 2A or 2B criteria, determined intraoperatively. The primary outcome was revision-free survival. Secondary outcome measures included the following PROM: 12-item Short Form Survey (SF-12), Knee Society Clinical Rating System (KSCRS), and the Western Ontario and McMaster Universities Arthritis Index (WOMAC). Statistical analyses were performed.

RESULTS:

Twenty-eight and 61 patients met inclusion criteria for the cementless and hybrid construct groups, respectively. There were no differences in age (71.8 vs. 68.3 years, $p=0.084$) or BMI (34.5 vs. 34.2 kg/m², $p=0.86$) between groups. With respect to PROM, there were no difference in preoperative (83.9 vs. 91.2 points, $p=0.278$) or latest (152.6 vs. 148.5 points, $p=0.652$) KSCRS scores. Similarly, the WOMAC preoperative (45.5 vs. 41.25, $p=0.299$) and latest (63.8 vs. 58.2, $p=0.377$) scores showed no differences. However, patients who underwent revision TKA cementless zone 2 fixation did demonstrate significantly better latest SF-12 physical (37.7 vs. 31.1 points, $p=0.010$) and mental component scores (52.9 vs. 47.8 points, $p=0.044$). No difference was noted between preoperative SF-12 physical (30.7 vs. 32.9 points, $p=0.607$) and mental components (47.5 vs. 49.5 points, $p=0.530$). Revision-free survival was 96.4% for cementless and 90.2% for hybrid fixation constructs ($p=0.42$). No difference was seen when excluding infections, with revision-free survival of 96.4% and 95.1% for cementless and hybrid constructs, respectively ($p=0.63$).

DISCUSSION AND CONCLUSION:

No difference was seen in intermediate-term, revision-free survival between zone 2 cementless fixation and hybrid fixation constructs used for moderate bone loss in revision TKA. Although the cementless group did demonstrate better SF-12 mental and physical component scores, no difference was seen between KSCRS and WOMAC scores between the cementless and hybrid fixation groups.