

Survivorship of Modern Cementless Total Knee Arthroplasty: Analysis from the Canadian Joint Replacement Registry

Olawale Sogbein, Richard W McCalden¹, Eric R Bohm², Brent Lanting³

¹London Health Sciences Centre, ²Concordia Hip and Knee Institute, ³LHSC - University Hospital

INTRODUCTION:

Previous attempts to improve survival using cementless fixation of total knee arthroplasty (TKA) were generally inferior to cemented designs. Modern cementless designs have addressed many of the previous shortcomings and consequently there may be improvement in survivorship of cementless TKA. We sought to evaluate the early survivorship of modern cementless total knee systems and, more specifically, to compare the performance of cementless TKAs to their intracompany cemented counterparts.

METHODS:

Data from the Canadian Joint Replacement Registry (CJRR) was used to analyze four popular TKA designs with both cemented and cementless versions. The primary outcome measure was all cause cumulative percent revision (CPR) at 8 years. Secondary outcomes included reasons for revision, and CPR by brand comparing cemented to cementless versions of the same knee system. Hazard ratios (HR) were used to control for the effect of age and sex.

RESULTS: We included 202,880 primary TKAs performed between 2012 and 2021, of which 9,163 (4.5%) were cementless. We did not find a difference in CPR between cemented (3.14%) and cementless (4.49%) implants (HR 0.87 [0.73 – 1.04], p=0.128). Infection (35.8% vs. 35.1%) and instability (23.4% vs. 29.7%) were the most common revision causes for cemented and cementless TKA respectively. The revision rates for aseptic loosening were similar (18.2% vs. 16.2%). Intra-brand comparison of cemented versus cementless fixation did not find differences in revision risk for 3 out of 4 brands. However, the most commonly used brand found better survival in the cementless version (HR 0.64 [0.50-0.82], p=0.001). p=0.001) at 4-year follow up.

DISCUSSION AND CONCLUSION: This study was the first to evaluate revision risk differences between cemented and cementless TKA using CJRR data. Overall, no differences in revision risk between fixation types was found. However, for the most common brand of cementless knee, it had a lower risk of early revision than its cemented version.