Fifty Years of Progress: Trends in Survivorship and Failure Mechanisms in Over 42,000 Primary THAs

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INTRODUCTION: Two common questions patients ask about total hip arthroplasty (THA) are: *How long will my implant last?* and *What are the reasons it may fail?* This study evaluated long-term trends in surgical approach, survivorship, and revision indications over a 50-year period using the largest single-institution THA cohort to date.

METHODS: We identified 42,768 primary THAs performed between 1969-2021 using our institutional total joint registry. Cases were analyzed by decade and by era (pre-2005 vs. post-2005). Surgical approach evolved over time: transtrochanteric (79%) predominated in 1969-79, followed by anterolateral (78%) in 1980-1999, and posterior (57%) in 2000-2021. Direct anterior approach emerged in 2010-2021, representing 19% of THAs in that decade. Kaplan-Meier survivorship analyses and univariate Cox models were performed. Mean age was 64 and 48% were female. Mean follow up was 10 years.

RESULTS: The 15-year survivorship free of any revision improved from 82% in pre-2005 THAs to 93% in THAs since 2005. The overall risk of revision was reduced 50% for THAs performed since 2005 ($p<0.001$). The risk of revision for aseptic loosening and polyethylene wear and/or osteolysis declined fivefold ($p<0.001$). Although the risk of revision for dislocation was unchanged and the absolute risk remained under 1%, dislocation accounted for one-third of all post-2005 THA revisions. The 15-year risk of revision for PJI increased (HR 1.6; $p<0.001$), and PJI also represented one-third of all post-2005 THA revisions. However, the 15-year survivorship free of revision for PJI risk remained high at 99%.

DISCUSSION AND CONCLUSION: The 15-year survivorship after primary THA has improved substantially over the last 5 decades, driven by advances in fixation and bearing materials. Contemporary THAs performed since 2005 have excellent survivorship that is two times better than THAs performed prior. While dislocation and PJI now account for a larger share of revisions, their absolute risk remains very low.