Fifty Years of Progress: Trends in Survivorship and Failure Mechanisms in Over 41,000 Primary TKAs

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INTRODUCTION: Patients commonly ask two questions about total knee arthroplasty (TKA): *How long will my implant last?* and *What are the reasons it may fail?* This study evaluated long-term trends in implant survivorship and revision indications over a 50-year period using the largest single-institution TKA cohort to date.

METHODS: We identified 41,329 primary TKAs (29,301 patients) performed between 1969 and 2021 using our institutional total joint registry. A majority (97%) were cemented. Cases were stratified by decade and by era (pre-2000 and post-2000). Kaplan-Meier survivorship analyses and univariate Cox regression models were performed. Mean age was 68 and 57% were female. Mean follow-up was 9 years.

RESULTS: The 15-year survivorship free of any revision improved from 82% for TKAs performed before 2000 to 92% for TKAs performed since 2000. The overall risk of revision was reduced by over half for TKAs performed since 2000 (HR 0.4; $p<0.001$). The risk of revision for aseptic loosening reduced by 70% ($p<0.001$) and the risk of revision for instability reduced by 45% ($p<0.001$) for TKAs performed since 2000. While the 15-year survivorship free of revision for PJI remained unchanged over 50 years at 98%, as other failure modes became less common, PJI became the leading indication for revision in TKAs performed since 2000, accounting for 40% of cases.

DISCUSSION AND CONCLUSION:

The 15-year survivorship after primary TKA has improved from 82% to 92% over the past 50 years. The risk of revision for aseptic loosening and instability has significantly improved, while the risk of PJI has not changed substantially. Although its absolute risk remains very low, PJI has become the most common indication for revision in modern TKAs.