Outcomes and Complications of Total Knee Arthroplasty in Nonagenarians: A Multicenter Retrospective Case Series

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INTRODUCTION: With an increasing elderly population, total knee arthroplasty (TKA) is being considered more frequently in nonagenarians (≥90 years). Limited data exist regarding the outcomes and complication rates in this group

METHODS: We retrospectively reviewed 198 patients aged 90 years or older undergoing primary TKA at seven institutions between 2014 and 2024. Demographic information, comorbidities, operative details, complications, and readmission rates (30 days, 90 days, and 1 year) were extracted from electronic medical records. Data were analyzed with descriptive statistics, chi-square tests, and logistic regression to identify factors associated with complications

RESULTS: Among 198 patients (mean age 91.55, range 90–101), the most common comorbidities were hypertension, diabetes, and chronic heart failure. The overall postoperative complication rate was 21.7%, [NY1] with prosthetic joint infections (6.1%) being the most frequent major complication. Other complications included thromboembolic events (2.0%), periprosthetic fractures (1.5%), and patellar clunk syndrome (1.0%). Medical complications such as cardiac events and wound issues were also documented but less common. Compared to previously published data in broader age cohorts—reporting complication rates ranging from 14% to 18% in the general arthroplasty population—our findings highlight an increased risk in nonagenarian patients undergoing total knee arthroplasty. The mean hospital length of stay was 3.5 ± 1.7 days. While many centers report average LOS between 1.5 to 2.5 days for TKA across all age groups, the extended stay observed in this cohort reflects both medical complexity and increased post-operative care needs in nonagenarian patients Readmission rates at 30 days, 90 days, and 1 year were 1.5%, 2.02%, and 1.52%, respectively. The mean knee flexion improved significantly, from 107.92° preoperatively to 111.89° postoperatively ($p < 0.001$)

DISCUSSION AND CONCLUSION: TKA in nonagenarians can offer substantial functional improvement and pain relief, despite a relatively higher risk of complications. Careful patient selection and optimized perioperative management may mitigate these risks. This study represents one of the most contemporary and comprehensive series of nonagenarian TKA patients to date, offering valuable real-world insights into the perioperative and functional outcomes in this understudied demographic. Further prospective studies are warranted to validate these findings and inform future risk stratification models tailored to the ultra-elderly population

Table 1. Descriptive Statistics of Patients ≥90 Years Undergoing TKA

Characteristic	Value
Number of Patients	198
Mean Age (years)	91.55 (range 90–101)
Mean Length of Stay (days)	3.5 ± 1.7
Readmission Rate at 30 days (%)	1.5
Readmission Rate at 90 days (%)	2.0
Readmission Rate at 1 year (%)	1.5
Mean Knee Flexion Preop (°)	107.92
Mean Knee Flexion Postop (°)	111.89 ($p<0.001$)

Abbreviations: TKA = Total Knee Arthroplasty.

Table 2. Key Findings of the Study

Finding	Value
Overall Complication Rate (%)	21.7
Prosthetic Joint Infection (%)	6.1
Thromboembolic Events (%)	2.0
Periprosthetic Fractures (%)	1.5
Patellar Clunk Syndrome (%)	1.0
Logistic Regression for ≥3 Comorbidities (p-value)	$p = 0.533$ (not significant)

Abbreviations: TKA = Total Knee Arthroplasty.