

Temporal Trends in Cementless Fixation and Patellar Resurfacing in Total Knee Arthroplasty: An Analysis of the American Joint Replacement Registry

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INTRODUCTION: While cemented fixation has historically been the gold standard in total knee arthroplasty (TKA), recent advancements in implant technology and biologic fixation have driven increased adoption of cementless fixation. Simultaneously, the routine practice of patellar resurfacing has come under question. This study examines national trends in cementless fixation and patellar resurfacing and investigates whether these patterns are temporally associated.

METHODS: We conducted a retrospective cohort analysis of 1,899,847 primary TKA procedures recorded in the American Joint Replacement Registry (AJRR) from 2012 to 2023. The average patient age was 67.6 years (SD = 9.3), of which 58.5% were female and 41.5% were male. Annual rates of cementless vs. cemented fixation and resurfaced vs. unresurfaced patellae were recorded. Temporal correlation between the two trends was evaluated using Pearson correlation coefficients.

RESULTS: Cementless fixation increased from 1.9% in 2012 to 21.8% in 2023. Over the same period, patellar resurfacing declined from 95.9% to 87.0%. When stratified by sex and age, cementless fixation demonstrated similar or lower revision rates compared to cemented fixation across most subgroups. However, females over age 65 demonstrated a statistically higher revision risk with cementless fixation (hazard ratio [HR] = 1.165; p = 0.0031). There was no statistically significant difference in revision risk between resurfaced and unresurfaced patellae across the entire cohort (HR = 1.056; p = 0.1331). A moderate positive correlation (r = 0.33) was found between the rising use of cementless fixation and the increase in patellar non-resurfacing.

DISCUSSION AND CONCLUSION: Cementless fixation and patellar non-resurfacing have gained traction over the past decade, with both trends appearing to evolve in parallel. This temporal association may reflect a broader shift of surgeon preferences and biologic fixation principles. These findings underscore the need for continued research on long-term outcomes and surgeon decision-making in modern TKA.

Figure 1: Trends in Cementless Fixation and Unresurfaced Patella Rates (2012-2023)

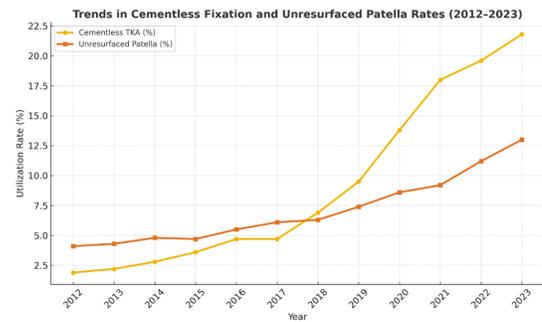


Figure 2: Year-over-Year Change in Cementless Fixation and Unresurfaced Patella Rates (2013-2023)

