

Paper #39

Total Knee Arthroplasty in the 21st Century: Why Do They Fail? A Fifteen-Year Analysis of 11,135 Knees

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Introduction: Efforts to improve TKA outcomes require understanding of the current mechanisms of failure in modern TKA. Revision TKAs reported to national registries lack clinical and radiological data to enable accurate identification of failure mechanisms. Similarly, reports on revision TKA from tertiary referral centres lack data on the overall denominator of primary TKA, therefore the relative importance of each failure mechanism leading to revision TKA remains unclear. The aim of this study was to identify reasons for failure following primary TKA, and assess their relative frequencies over long-term follow-up.

Methods: We identified 11,134 primary TKA performed between 2000–2015 at three tertiary referral hospitals. 'Failure' was defined as subsequent revision surgery involving change of one or more components or reoperation due to deep periprosthetic joint infection (PJI). Patients undergoing subsequent revision surgery were identified using individual search of patient records, supplemented with National Joint Registry data to identify revision TKA performed at outside hospitals. Relevant clinical records, radiographs, and lab results were reviewed to identify the primary reason for failure, according to a standardized protocol.

Results: A total of 357 failures over the 15-year period were identified. Clinical and radiographic data was obtained for all patients, including those undergoing revision at outside hospitals. The cumulative probability of failure at 15 years was 6.1% (standard error (SE) 0.4). At 10 years, the most common cause for failure was PJI (2.0% +/- SE0.2), 2.5 times more common than aseptic loosening. The majority of PJI occurred within the first 4 years (1.4%+/- SE0.1), with subsequent annual incidence of PJI of 0.1% per year. After 10 years, the reason with the highest annual incidence was aseptic loosening (0.3%).

Conclusions: In this large cohort of patients with comprehensive follow up, PJI was the dominant reason for failure in the first 15 years following primary TKA. Aseptic loosening became more important with longer follow up duration. Efforts to improve outcome following primary TKA should focus on these areas, particularly prevention of PJI.

