

Periprosthetic fractures of the tibia in knee arthroplasty have a high risk of treatment failure: A systematic review

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INTRODUCTION: Tibial periprosthetic fractures (PPF) are rare but potentially devastating complications following knee arthroplasty. Despite the increasing number of knee replacements worldwide, there is limited data in the literature regarding these injuries. This systematic review aimed to add up-to-date, evidence-based data on tibial PPF that may lead to a more standardised approach and improved outcomes.

METHODS: A systematic search of PubMed, Virtual Health Library and Cochrane Library databases was performed in accordance with PRISMA guidelines, including studies published from January 2015 to January 2025. Studies were eligible if they reported tibial PPF in knee arthroplasty with at least three patients, describing the treatment approach and follow-up. Data extracted included patient demographics, fracture classification, treatment method, outcomes and methodological quality.

RESULTS: Seventeen studies met the inclusion criteria, including 473 patients with a mean age of 67.6 ± 2.5 years. Felix classification was used for 172 patients, Type 3 being the most common (48%). Overall union rate was 87%. While 29% of fractures were managed conservatively, 71% underwent operative management, with open reduction and internal fixation (ORIF) being the most common at 55%. The complication rate was 38%, with infection being the most common standing at 13%. The secondary intervention rate was 28%, most commonly due to failure of initial management and soft-tissue-related complications.

DISCUSSION AND CONCLUSION: Tibial PPF is a rare but demanding complication of knee arthroplasty, associated with high complication (38%) and reoperation (28%) rates. Optimisation of surgical techniques is crucial to prevent iatrogenic fractures. Provided that the implant is stable, fracture fixation is effective following the appropriate principles depending on the personality of the fracture. Revision TKA may also be effective as a first-line option. Considering the scarce evidence in the literature and the high volume of worldwide knee arthroplasties performed, further high-quality studies are crucial to improve outcomes.