300 Periprosthetic Tibia Fractures Around a TKA: Characteristics and Outcomes from a Single Center

Thomas Alter, Evan Michael Dugdale[1], Michael J Stuart, Stephen A Sems[1], Brandon J Yuan[1], Mark J Spangehl[1], Bryan Donald Springer[2], Daniel J Berry[1], Matthew Philip Abdel[1]
[1]Mayo Clinic, [2]Orthocarolina

INTRODUCTION: Periprosthetic tibia fractures around a total knee arthroplasty (TKA) remain challenging to manage with little published information for guidance. The purpose of this study was to review the characteristics, management techniques, and outcomes of periprosthetic tibia fractures in the largest series to date.

METHODS: We identified 300 periprosthetic tibia fractures (285 patients) around a TKA (43% primaries, 57% revisions) sustained between 1996 and 2020. Fractures were classified according to Felix et al. as Type I (tibial plateau), II (adjacent to stem), III (distal to stem), or IV (tibial tubercle) with subtypes A (well-fixed component), B (loose component), and C (intraoperative fracture). Mean age at fracture was 67 years and 64% were female. Mean follow-up was 6 years.

RESULTS: There were 53% Type I, 24% Type II, 16% Type III, and 8% Type IV fractures. A total of 46% occurred intraoperatively and 54% postoperatively (61% subtype A, 39% subtype B). Intraoperative fracture incidence was 0.10% in primary TKAs and 1.4% in revision TKAs. Among intraoperative fractures, the 2-year survivorship free from a subsequent operation involving tibial component revision was highest in Type I (100%), followed by Type II (90%), Type III (86%), and Type IV (67%; $p<0.001$). The estimated 5-year cumulative incidence of postoperative fractures was 0.1% and 0.7% in primary and revision TKA, respectively. The highest 2-year survivorship free from tibial component revision from time of postoperative fracture was in Type III fractures (88%), followed by Type IV (79%), Type II (51%) and Type I (10%; $p<0.001$).

DISCUSSION AND CONCLUSION: Intraoperative periprosthetic tibia fracture incidence was 14-fold higher in revision TKA compared to primary TKA. Among all intraoperative fractures, tibial plateau fractures were well-tolerated with 100% survivorship free of tibial component revision. Conversely, postoperative tibial plateau fractures had only a 10% survivorship free of tibial component revision at 2 years.