Outcomes After Lateral Locked Plating of Inter-prosthetic and Inter-implant Femur Fractures

Phillip Grisdela, Robert Wagner¹, Jarod Taylor Griffin, Maaz Muhammad², Jacob Samuel Wolf Borgida, Bryce Michael Jensen³, Sravya Challa, Hayley Daniell², Nishant Suneja, Derek S Stenguist

¹Amsterdam UMC, ²Massachusetts General Hospital, ³Texas A&M Health Science Center - Round Rock INTRODUCTION:

Inter-prosthetic (IP) and inter-implant (II) femur fractures are challenging to treat. Choice of implant is dictated by fracture pattern, configuration of existing implants, and bone stock. Prior series have included heterogeneous fixation methods and revision arthroplasty. The purpose of this study was to investigate outcomes after lateral locked plating (LLP) of IP and II fractures, including fractures below a total hip arthroplasty (THA) or cephalomedullary nail (CMN).

METHODS: All patients over 50 years of age with a femur fracture treated with plating at two Level 1 trauma centers between 2010-2023 were reviewed to identify consecutive patients with an IP or II femur fracture. Patient demographics, complications, and pertinent surgical characteristics (prosthesis/implant type, plate type and metallurgy, plate length, working length, screw density) were collected. Primary outcomes were all-cause unplanned reoperation, reoperation for nonunion, and deep infection rates.

RESULTS: 1,141 patients were reviewed and 50 patients with IP/II fractures met inclusion criteria. Median age was 81 years, 82% female, and 98% due to low energy falls. There were 3 fractures below a CMN, 5 below a hip hemiarthroplasty, 35 below a primary THA, and 7 below a revision THA. The majority of femoral components were uncemented (76%). There were 47 primary total knee arthroplasties (TKA) (94%) and 3 revision TKA. There were 5 Vancouver B1 fractures (10%) and 45 Vancouver C fractures (90%). Submuscular plating was used in 34 fractures (29%), open reduction and cerclage wiring in 14 (29%), and lag screws with neutralization plating in 2 patients (4.2%). There was one nonunion (2%) after submuscular plating, successfully managed with revision ORIF. There were 2 deep infections (4%) after submuscular plating, including one rTHA/pTKA, which required 7 surgeries and ultimately an above knee amputation.

DISCUSSION AND CONCLUSION: There was a low rate of nonunion and infection in this cohort of IP/II femur fractures treated with LLP when fixation strategy was guided by fracture pattern and in situ implants. However, bone stock may be limited in cases with revision arthroplasty and patients should understand that the consequences of nonunion or infection requiring multiple reoperations may be severe.