The Use of External Fixation for Distal Femur Fractures: Impacts on Reoperation, Stiffness, and Overall Outcomes

Yvonne Chodaba Conway, MD; Alexander Roszman, MD; Ryan Cone, MD; Kyle Cichos, BS; Gerald McGwin, MS; ***Clay A. Spitler, MD***
University of Alabama at Birmingham, Birmingham, Alabama, UNITED STATES

Purpose: In spite of the advent of locked plating, distal femur fractures continue to be plagued by high complication and reoperation rates. Initial treatment of these injuries is directed by the patient's medical stability, soft-tissue conditions, and the need for orthopaedic trauma training for complex fractures. This can lead to staged procedures using initial external fixation and subsequent open reduction and internal fixation (ORIF). The purpose of this study was to evaluate whether external fixation prior to definitive fixation of distal femur fractures is associated with an increased risk of complication/reoperation.

Methods: After IRB approval, a retrospective review was performed of all patients >18 years old with operative distal femur fractures (AO/OTA 33A/33C) at our Level I trauma center from 2004 to 2019. Patients were excluded if they were managed with screw fixation only or acute arthroplasty, had inadequate clinical or radiographic documentation, or had follow-up less than 6 months. Patients were separated into 2 groups: patients having external fixation and those not requiring external fixation. Reoperations including surgical-site infection (SSI), nonunion, malunion, arthrofibrosis, heterotopic ossification (HO) formation, manipulation under anesthesia (MUA), and lysis of adhesions (LOA) were analyzed.

Results: A total of 439 distal femoral fractures were included. The external fixator was utilized in 173 cases (39%) and 266 cases (61%) were treated with primary ORIF. Average time in the external fixator was 4.2 days. There were 330 AO/OTA Type 33C fractures, and C type fractures were more likely to be treated in a staged fashion (86% vs 68%, P<0.0001). Open fractures were also more likely to be treated with external fixation (67% vs 20%, P<0.0001). There was no difference in infection rate (7% vs 5%, P = 0.29), nonunion rate (18% vs 11%, P = 0.07), return to the operating room (15% vs 14%, P = 0.78), or revision ORIF (12% vs 9%, P = 0.33) between the 2 groups. Additionally, there was no difference between the external fixation group and no-external fixation group for arthrofibrosis (3% vs 5%, P = 0.46) or reoperation for stiffness (3% vs 5%, P = 0.34), lysis of adhesions (1% vs 3%, P = 0.10), and MUA (2% vs 3%, P = 0.58).

Conclusion: External fixation of distal femur fractures as a means of temporary stabilization prior to definitive ORIF does not increase risk of complications when compared to single-stage ORIF of distal femur fractures. When necessary, staged management of distal femoral fractures is safe and does not increase complication rates.