

Complications in the Treatment of Femur Fractures in Patients with Preexisting Spinal Cord Injury

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Background/Purpose: Long-bone fractures in patients with a preexisting spinal cord injury (SCI) present a unique challenge to the orthopaedic surgeon. The incidence of at least one fracture during a patient's lifetime following SCI is 25% to 34%. The unique physiology of paraplegics, including a negative nitrogen balance, insensate skin, infectious risks, and osteoporosis, contribute not only to the fracture, but also to their altered healing potential and complications associated with treatment strategies. Based on the limited literature and variable findings, there is no consensus on the optimal treatment of long bone fractures in patients with preexisting SCI. The purpose of this study is to describe the outcomes of femur fractures treated both nonoperatively and operatively in patients with preexisting SCI and lower extremity paraplegia.

Methods: A retrospective review of consecutive patients 18 years of age and older who sustained a femur fracture in the setting of preexisting SCI and lower extremity paraplegia from 2005 to 2014 was performed. The medical record was used to record demographics, mechanism of injury, AO/OTA fracture classification, treatment, and length of hospital stay. Primary outcome measures included readmission, reoperation, hardware failure, infection, fracture union, decubitus ulcer formation, subjective care complaints, and mortality. Univariate analysis was conducted to examine the relationship between demographics, injury characteristics, and outcomes.

Results: 24 patients (19 male and 5 female) with an average age of 45 years were identified to have sustained a total of 27 femur fractures in the setting of a previous SCI and lower extremity paraplegia. The average time from SCI to femur fracture was 17 years (range, 1.5-23 years). The most common mechanisms of injury were falls and wheelchair transfers. The most frequent locations included 8 spiral diaphyseal fractures (AO/OTA 32A) and 7 distal extra-articular fractures (AO/OTA 33A). 16 fractures were treated nonoperatively and 11 were treated operatively. The average length of stay for the nonoperative patients was 5.2 days and for the operative patients was 7.5 days ($P = 0.36$). There were significantly more patients in the operative group who required an unplanned secondary surgery (6) as compared to a single patient in the nonoperative group who later underwent operative intervention ($P = 0.01$). Secondary surgeries included removal of hardware, irrigation and debridement, and amputation. Four operative patients developed an infection as compared to none in the nonoperative group ($P = 0.02$), and three developed hardware failure. No patients died within 2 years of their fracture.

Conclusion: Surgical treatment of femur fractures in patients with a preexisting SCI and lower extremity paraplegia is fraught with complications. Operative management in our study cohort resulted in rates of reoperation of 55%, infection 36%, and hardware failure 18%. The occurrence of decubitus ulcers postinjury and readmission rates were similar among operatively and nonoperatively treated patients, and subjective care complaints were

insignificant. Based on our experience, we recommend nonoperative treatment of femur fractures in patients with preexisting SCI and lower extremity paraplegia.

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.