Low-Energy Gunshot Injuries to the Femur:
What Is the Utility of Stabilizing Incomplete Fractures?
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Purpose: Extremity involvement is common among gunshot injuries, 57% with associated fractures. Patients may present with cortical penetration of the bullet without a complete fracture, thus without displacement. Treatment recommendations are variable with some advocating protected weight bearing to promote healing without fracture displacement, and with others performing prophylactic stabilization to protect against displacement of the fracture. The purpose of this study was to review our experience in the management of these injuries and to develop treatment recommendations.

Methods: 51 skeletally mature patients were treated over 15 years at an urban Level I trauma center for incomplete fractures of the femur secondary to low-energy gunshot. One died from severe head injury on the date of presentation. Clinical and radiographic data were obtained for the other 50 patients. Fracture patterns included AO/OTA 31 (n = 4), 32 (n = 31), and 33 (n = 15). All fractures were nondisplaced and extra-articular.

Results: 49 men and 1 woman with mean age 22.7 years (range, 16-58), and mean body mass index (BMI) 29.5 (range, 18.8-40) were included. 14 were obese with BMI>30. 34 had injury isolated to the femur, while 7 had injuries to other body systems, and 9 had other fractures. 36 patients (72%) were managed nonoperatively with protected weight bearing for 6 weeks, while 14 patients (28%) underwent prophylactic fixation of the femur. No differences in treatment were seen based on age, BMI, fracture pattern, or presence of other fractures or system injuries. Prophylactic surgery was more likely over time: 16.7% during the first 5 years of study, 21.4% over the middle 5 years, and 40% during the last 5 years. Two of the 36 patients (5.6%) treated nonoperatively for shaft fracture fell at 10 days and 5 weeks after injury and displaced their fractures. Both underwent reduction and fixation. All other fractures maintained alignment until union. No infections or nonunions were seen. Among patients who underwent prophylactic fixation, 2 underwent removal of prominent implants after union. Two patients returned for removal of prominent bullet fragments at 4 weeks and 3 years after injury.

Conclusion: Less than 6% of incomplete femur fractures treated at our hospital required later surgery for fracture displacement. Although incomplete fractures occur infrequently, nonoperative management appears successful and cost-effective for most patients. We propose this strategy, and potentially extrapolating it to similar fractures in other locations.

See pages 401 - 442 for financial disclosure information.