

**Outcomes of Low-Velocity Ballistic Femoral Shaft Fracture**

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**Purpose:** Ballistic femur fractures are a common injury treated at urban, civilian trauma centers in the United States. This study investigates the outcomes of these injuries by comparing the rate of infection, nonunion, secondary operations, and associated injuries from low-velocity gunshot wound (GSW) injuries with closed fractures sustained by blunt trauma.

**Methods:** A retrospective review of 345 patients with femoral shaft fractures treated at a single Level I trauma center from 2011 to 2020 was conducted. Operative injuries were managed by fellowship-trained orthopaedic surgeons utilizing standard techniques. Patients were categorized by mechanism of injury, and the following outcomes were examined: superficial and deep infection, compartment syndrome, nonunion, malunion, associated injuries, and secondary operations.

**Results:** Over 9 years, 148 patients in the GSW group and 197 patients who sustained closed fracture from blunt trauma were included. The rates of deep infection were similar between GSW and blunt trauma femur fractures at 1.35% and 1.52% respectively ( $P=0.64$ ). Nonunions occurred in 8 blunt trauma patients (4.1%), while no GSW patients experienced nonunions ( $P=0.08$ ). The rate of compartment syndrome was higher in the GSW group ( $n=9$ , 6.08%;  $P<0.001$ ) versus none after blunt trauma. Associated arterial injury requiring repair after GSW occurred in 9% ( $P<0.001$ ), while no blunt injuries had arterial injury requiring repair. Finally, the rate of secondary operation was nearly equivalent between the GSW and blunt trauma groups at 8.1% and 8.12%, respectively ( $P=0.93$ ).

**Conclusion:** Ballistic femoral shaft fractures are often equated with open injuries; however, our data indicate rates of infection, nonunion, and secondary operations closely mirror those of closed injuries resulting from blunt force trauma. Compartment syndrome and arterial injury are more common after low-velocity GSW and warrant careful clinical examination.