

**Geriatric Distal Femur Fracture: 1 in 3 Chance of Death or Nonunion Surgery at 1 Year***Gele Moloney, MD; Tiffany Pan, MD; Carola Van Eck, MD; Devan Patel, BS;**Ivan Tarkin, MD**University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania, USA*

**Background/Purpose:** Fractures of the distal femur occur commonly in elderly patients after low-energy trauma. The purpose of our study was to investigate rates of mortality and nonunion following open reduction and internal fixation (ORIF) of low-energy distal femur fractures in a geriatric population. In addition, we sought to quantify the length of inpatient hospitalization and discharge disposition to better understand the impact of this injury on the health-care system.

**Methods:** After obtaining IRB approval we retrospectively reviewed patients aged 60 and above who sustained a low-energy distal femur fracture (AO/OTA 33) treated with ORIF using laterally based locked plating at three affiliated institutions from 2004 through 2014. Primary outcomes included death, symptomatic nonunion, and reoperation to promote union. Age-adjusted Charlson Comorbidity Index (CCI) was calculated based on comorbidities documented in the electronic medical record. Length of stay was calculated and discharge disposition was recorded.

**Results:** 176 patients were included in the final analysis. *Mortality:* 30-day, 90-day, and 1-year mortality were 6% (11 patients), 11% (20 patients), and 25% (44 patients) respectively. Significant predictors of 1-year mortality included increased age ( $82 \pm 9$  vs  $76 \pm 9$ ,  $P < 0.001$ ), increased CCI ( $4.5 \pm 2.5$  vs  $3.3 \pm 2.1$ ,  $P < 0.02$ ), and increased age-adjusted CCI ( $7.2 \pm 2.3$  vs  $5.4 \pm 2.2$ ,  $P < 0.001$ ). *Nonunion:* In 99 patients alive and with 1-year follow-up there were 24 symptomatic nonunions identified (24%); 21 were treated with reoperation, either with revision ORIF or conversion to distal femoral replacement. Age ( $71 \pm 8$  vs  $75 \pm 8$ ,  $P > 0.05$ ), CCI ( $2.7 \pm 2.1$  vs  $3.7 \pm 2.3$ ,  $P > 0.05$ ), and age-adjusted CCI ( $5.5 \pm 2.4$  vs  $5.9 \pm 2.4$ ,  $P > 0.05$ ) were not significant predictors of nonunion. Development of surgical site infection was associated with a sixfold increase in development of nonunion. *Length of Stay/Disposition:* The postoperative length of hospital stay averaged 8.1 days (SD 6.6 days). Additionally, 154 patients (87%) were discharged to a skilled nursing facility (SNF).

**Conclusion:** The low-energy geriatric distal femur fracture occurs in a frail, elderly population and is associated with significant mortality and risk for nonunion. In our series, 65 patients (36%) underwent reoperation for nonunion or died within 1 year of fracture. Increased age and comorbidities are associated with death at 1 year, but not nonunion. Development of surgical site infection is a significant risk factor for nonunion. Additionally, with the increasing emphasis on providing cost-effective health care, the financial burden associated with long inpatient hospitalizations and postacute SNF placement in the vast majority of patients should be acknowledged.