

**Hoffa Fragments in the Geriatric Distal Femur Fracture: Myth or Reality?***Brian Hill, MD; Praveen Nandamuru, BS; Lisa K. Cannada, MD**Saint Louis University, St. Louis, Missouri, USA*

**Purpose:** Previous research reported the frequency of coronal plane (Hoffa) fractures in high-energy supracondylar-intercondylar femur fractures. The study population was relatively young. However, the fracture patterns may not be similar to osteoporotic patients. The purpose of this study is to identify the frequency of coronal plane fractures seen in in elderly ( $\geq 60$  years of age) patients. Our hypothesis is that elderly patients will have a significantly lower frequency of Hoffa fractures due to their bone quality combined with a likely different mechanism of injury.

**Methods:** Between 2011 and 2014, all patients over the age of 18 years treated for supracondylar femur fractures at two Level I trauma centers were reviewed. Patients were excluded if they did not have CT scans of their knee or if they had previous implants to the distal femur. Patient and injury characteristics along with fracture patterns were recorded. The patients were then stratified ( $\geq 60$  years and  $< 60$  years) and compared to determine were differences in injury characteristics and/or fracture patterns with special attention to the incidence of coronal plane fractures. Binary comparisons were made using a Fisher exact test and ordinal or continuous variables were analyzed via Mann-Whitney *U* test. Significance was set at  $P < 0.05$ .

**Results:** 110 patients were identified with supracondylar femur fractures (12 OTA 33A; 2 OTA 33B; 96 OTA 33C). 32 of the 96 intercondylar fractures (33%) were in patients  $\geq 60$  years of age. Coronal plane fractures were visualized on CT scans in 56 (58%) of the 33C femur fractures. 44% of elderly patients sustained a coronal plane fracture compared with 66% percent of the younger cohort ( $P = 0.04$ ). The elderly group included a higher percentage of females (81% vs 36%,  $P = 0.0001$ ) and were more likely to sustain their injury due to a fall (59% vs 19%,  $P = 0.0001$ ). The percentage of open fractures (30% elderly vs 46%) was not significantly different between the two groups ( $P = 0.17$ ). The majority of coronal fractures were located on the lateral femoral condyle (86% elderly vs 60%,  $P = 0.10$ ) in both groups. The average ISS was similar between the groups: 16 in both ( $P > 0.05$ ).

**Conclusion:** The 58% of distal femur fractures with coronal fracture identified in this study population is higher than previously reported. This is the first study to specifically look at the rate of Hoffa fractures in the elderly. We found elderly patients more commonly sustained their injury as a result of a fall and had a lower percentage of patients with Hoffa fractures compared with the younger patients with higher-energy injuries. The occurrence rate of 44% in this study was higher than expected and is the first to provide a occurrence rate in the elderly of this fracture. It is important that a high index of suspicion be maintained for the Hoffa fracture in all distal femur fractures, regardless of age or mechanism of injury. This allows for proper planning and treatment of these fractures.