

**Functional and Clinical Outcomes of Nonoperatively Managed Tibial Plateau Fractures***Christian Pean, MS; Anthony Christiano, BA; Sanjit Konda, MD; Roy Davidovitch, MD;**Kenneth A Egol, MD;**Hospital for Joint Diseases, New York, New York, USA*

**Background/Purpose:** This study sought to assess and compare long-term functional and clinical outcomes in patients with tibial plateau fractures that are treated nonoperatively.

**Methods:** Over 8 years, 275 consecutive tibial plateau fractures were treated by two surgeons at a single institution and followed prospectively in an IRB-approved study. Overall, 28 patients (10%) were treated nonoperatively and followed for a mean  $21 \pm 15.5$  months. All patients were treated similarly: kept non-weight-bearing for a minimum 10 weeks and prescribed a similar physiotherapy regimen. Patients were categorized into one of two cohorts based on the indication for nonoperative care: (1) minimal fracture displacement (MFD) defined as less than 2 mm of articular depression or 1 mm fracture gap or (2) surgery precluded (SP) by patient characteristics such as severe comorbidities at time of treatment or delayed presentation. Clinical follow-up included functional score, clinical examination, and radiologic evaluation. Student t tests for continuous variables and chi-square tests for categorical variables were used to assess differences between the groups. A multiple linear regression analysis of the entire cohort controlling for gender, age, smoking history, age-adjusted CCI (Charlson comorbidity index) and injury energy level was used to identify independent factors predictive of Short Musculoskeletal Function Assessment (SMFA) scores.

**Results:** 23 patients were available for long-term follow-up. The cohort was 48% male,  $51.3 \pm 15.6$  years of age, and had a mean age-adjusted CCI of  $0.7 \pm 1.7$ . Overall, 57% of injuries were due to a high-velocity energy mechanism, and the fracture breakdown by Schatzker classification was as follows: 5 type I, 7 type II, 3 type III, 6 type IV, and 2 type VI. Average total SMFA at latest follow-up was  $14.7 \pm 18.2$  points and mean VAS (visual analog scale) pain score was  $2 \pm 2.8$ . Overall, 65% ( $n = 15$ ) of patients in this study attained good to excellent functional outcomes as defined by a total standard SMFA score of 15 or less. 22% ( $n = 5$ ) had radiographic evidence of knee arthritis. Average knee range of motion (ROM) at latest follow-up for this cohort was  $130^\circ \pm 6.5^\circ$ . In the patients in whom surgery was precluded, ROM ( $123^\circ \pm 15.3^\circ$  vs  $132^\circ \pm 3.8^\circ$ ,  $P = 0.03$ ) and outcome scores ( $44.03 \pm 19.8$  vs  $10.4 \pm 13.6$ ) were significantly poorer. To date, no patient had undergone total joint arthroplasty following index injury. Age was the only statistically significant predictor of total SMFA in a multiple linear regression analysis of the cohort,  $F(6,16) = 5.139$ ,  $P = 0.007$ , adjusted  $R^2 = 0.530$ .

**Conclusion:** A large proportion of carefully selected patients with minimally displaced tibial plateau fractures can expect good to excellent outcomes when managed nonoperatively. Patients with comorbidities precluding surgery for tibial plateau fractures at time of presentation have long-term sequelae from this injury including chronic pain and poorer functional outcomes.