Fix 'Em or Leave 'Em Alone? Impact of Tibial Spine Fractures on Outcomes in Tibial Plateau Fractures

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Purpose: Fracture mapping studies have identified central comminution in up to 30% of tibial plateau (TP) fractures. This zone may compromise outcomes with involvement of the tibial spine (TS) due to potential knee instability or posttraumatic arthritis. There are no studies on the impact of TS fractures on outcomes after TP fractures. The purpose of this study was to describe outcomes of patients with TP fractures with associated TS fractures.

Methods: This was a retrospective study of consecutive patients >18 years undergoing open reduction and interval fixation (ORIF) of a TP fracture at a Level I trauma center between 2011 and 2020. Patient demographics, fracture patterns, and surgical and radiographic outcomes were recorded. Patients included were followed for >6 months or until clinical and radiographic union.

Results: 122 patients with TP fractures involving the TS were identified (average 50 years of age, 62% male). TS involvement was more common in bicondylar patterns (67%). Most fractures were high-energy mechanisms (84%), 20% were open, and 46% were in polytrauma patients (average ISS 16). Concomitant meniscal tear was present in 28%. The average TS fragment displacement was 4.1 mm, which decreased to 1 mm postoperatively. The deep infection rate was 13% and reoperation rate 24%. The average range of motion arc at final follow-up was 110 degrees and 4% required lysis of adhesions or manipulation under anesthesia (MUA) for arthrofibrosis. There were no recorded cases of knee instability. The average Kellgren-Lawrence arthritis score at last follow-up was 1.6 (range, 0-4). Rate of early conversion to total knee arthroplasty (TKA) was 4%. Average coronal alignment (medial proximal tibial angle [MPTA]) was 86° and sagittal alignment (posterior proximal tibial angle [PPTA]) 9°. Only 5 patients underwent fragment-specific TS fixation (4%). The average initial displacement of the TS fragment was 5.0 mm, which decreased to 3.1 mm after fixation. Four had the TS secured with suture through bone tunnels and one was fixed with a screw. None of the patients with TS fixation had knee instability or went on to early TKA.

Conclusion: Following ORIF of TP fractures, displacement of associated TS fragments decreases with or without specific TS fixation. There were no cases of knee instability, relatively mild arthritis, and rare early conversion to TKA. Fixation of TS fragments can be performed at surgeon discretion based upon injury pattern and preference but does not appear to impact outcomes.