Function and Knee Range of Motion Plateau 6 Months Following Tibial Plateau Fractures

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Purpose: Tibial plateau fractures are common and drastically affect patient quality of life. Adequate care and patient education are pivotal for patient recovery. The purpose of this study is to determine when function, range of knee motion (ROM), and pain levels no longer improve following tibial plateau fracture.

Methods: A consecutive series of patients who sustained a tibial plateau fracture were reviewed. Patients were evaluated postoperatively using the Short Musculoskeletal Function Assessment (SMFA), physical examination, and radiographic examination at regular intervals for a minimum of 12 months. Preoperative radiographs were reviewed, and fractures were classified based on the Schatzker classification. The cohort was divided into high- and low-energy fractures based on Schatzker classification. A Friedman test was run on each group to determine if there were differences in SMFA standardized scores, range of motion, and pain levels at 3, 6, and 12 months after surgery. Pairwise comparisons were performed with a Bonferroni correction for multiple comparisons.

Results: 84 patients with complete SMFA follow-up at 3, 6, and 12 months were identified. 78 (93%) had known ROM at all three time points. 74 (88%) had a known pain score at all three time points. Fifty patients (60%) had low-energy fractures (Schatzker 1-3). 34 patients (40%) had high-energy fractures (Schatzker 4-6). SMFA total score ($P < 0.0005$) and knee ROM ($P < 0.0005$) were significantly different when comparing all three time points following both low- and high-energy tibial plateau fractures. Pain level was not different at any time (High $P = 0.718$, Low $P = 0.760$) in either group. Post hoc analysis revealed significant differences in standardized SMFA total score, ROM, and most SMFA subscores between 3 and 6 months as well as 3 and 12 months postoperatively in both groups. There was no statistically significant difference for any of the studied metrics between 6 and 12 months in the low-energy cohort. The mobility category ($P = 0.046$) and daily activities category ($P = 0.033$) were the only scores to show significant differences between 6 and 12 months in the high-energy cohort.

Table 1:
Pairwise comparisons of SMFA scores between 6 and 12 months

Score	High Energy Adjusted p-value	Low Energy Adjusted p-value
Total SMFA	0.087	1.000
Function Index	0.118	1.000
Bothersome Index	0.236	1.000
Daily Activities Category	0.033*	1.000
Emotional Status Category		0.634
Mobility Category	0.046*	0.881
ROM	0.974	1.000

* Indicates significance at $p<0.05$

Conclusion: In this cohort, no significant difference in function, ROM, or pain level exists between 6 months and 12 months after treatment of low-energy tibial plateau fractures. However, there are significant differences in mobility and daily activity between 6 months and 12 months after treatment of high-energy tibial plateau fractures. Patients can be counseled that 6 months after low-energy tibial plateau fractures patients should not expect significant changes in function or ROM. However, patients with high-energy tibial plateau fractures can be counseled that they can expect continued significant changes in mobility and ability to conduct daily activities up to 12 months after surgery.

See pages 47 - 108 for financial disclosure information.