

Proximal Tibia Fracture Dislocations: Management and Outcomes of an Underrecognized Injury

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Purpose: Proximal tibia fracture dislocations (PTFDs) are a subset of plateau fractures, with little in the literature since description by Hohl (1967) and classification by Moore (1981). We sought to evaluate reliability in diagnosis of fracture-dislocations by traumatologists and to compare their outcomes with bicondylar tibial plateau fractures (BTPFs).

Methods: This was a retrospective cohort study at 14 Level I trauma centers throughout North America. In all, 4771 proximal tibia fractures were reviewed by sites and 278 possible PTFDs were identified using the Moore classification. These were reviewed by an adjudication board of 3 traumatologists to obtain consensus. Outcomes included interrater reliability of PTFD diagnosis, wound complications, malunion, range of motion (ROM), and knee pain limiting function. These were compared to BTPF data from a previous study.

Results: Of 278 submitted cases, 187 were deemed PTFDs, representing 4% of all proximal tibia fractures reviewed and 67% of those submitted. Interrater agreement by the adjudication board was good (83%). 61 PTFDs (33%) were unicondylar. 11 (6%) had ligamentous repair and 72 (39%) had meniscal repair. Two required vascular repair. Infection was more common among PTFDs than BTPFs (14% vs 9%, $P = 0.038$). Malunion occurred in 25% of PTFDs. ROM was worse among PTFDs, although likely not clinically significant. Knee pain limited function at final follow-up in 24% of both cohorts.

Conclusion: PTFDs represent 4% of proximal tibia fractures. They are often unicondylar and may go unrecognized. Malunion is common, and PTFD outcomes may be worse than bicondylar fractures.

	PTFD (n=187*)	Bicondylar Tibial Plateau Fracture (n=1297*)	p-value†
Age at injury in years, mean (SD)	48 (16)	50 (14)	0.056
Sex, n (%)			
Female	82 (44)	541 (46)	0.186
Male	105 (56)	647 (54)	
Body mass index, mean (SD)	29 (7)	30 (7)	0.914
Injury Severity Score, mean (SD)	10.3 (6.8)	10.5 (7.0)	0.508
Mechanism of injury, n (%)			
Fall from height	73 (39)	418 (32)	<0.001
Fall from standing	12 (6)	205 (16)	
MVC	31 (17)	230 (18)	
MCC	29 (16)	255 (20)	
Pedestrian vs auto	10 (5)	94 (7)	
Other	32 (17)	80 (6)	
Laterality, n (%)			
Left	98 (52)	662 (51)	0.115
Right	89 (48)	634 (49)	
Open fractures, n (%)	7 (4)	123 (9)	0.009
Compartment syndrome, n (%)	18 (10)	166 (13)	0.255
Ipsilateral bony injury, n (%)	24 (13)	245 (19)	0.042
Temporary ex-fix used, n (%)	149 (80)	813 (63)	<0.001
Plating, n (%)			
Medial only	57 (31)	129 (10)	<0.001
Lateral only	35 (19)	457 (37)	
Dual plating	89 (49)	648 (53)	
Wound dehiscence, n (%)	17 (9)	72 (6)	0.070
Wound infection, n (%)	26 (14)	118 (9)	0.038
Time to radiographic union in months, mean (SD)	6 (7)	6 (8)	0.671
Malunion, n (%)			
Articular	27 (14)	92 (7)	0.001
Metaphyseal	3 (2)	34 (3)	0.404
Range of motion at last follow-up, mean (SD)			
Extension	3 (5)	2 (4)	<0.001
Flexion	112 (19)	116 (39)	
Time to return to work in months, mean (SD)	7 (7)	9 (14)	0.195
Knee limiting function at last follow-up, n (%)	39 (24)	277 (24)	0.851

*Missing data in some cells, percents reflect individual denominators
 †Chi-squared test for categorical variables, Wilcoxon rank sum (Mann-Whitney U) test for continuous variables

Table 1. Comparison of proximal tibia fracture dislocations (PTFDs) with bicondylar tibial plateau fractures

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