Outcomes of Surgically Treated Interprosthetic Femur Fractures versus Periprosthetic Femur Fractures

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Purpose: As the population ages, the number of periprosthetic and interprosthetic femur fractures (IPFFs) continues to increase. Current literature has a substantial amount of information regarding periprosthetic femur fractures (PPFFs); however, there remains a paucity of data concerning IPFFs. The aim of our study is to identify risk factors associated with poor outcomes in these fractures and to compare overall outcomes of surgically treated IPFFs with PPFFs.

Methods: A retrospective review of adult patients from 2015 to present at a single Level I academic trauma center who suffered a PPFF or IPFF was completed. CPT codes and radiographic review were used to identify patients with PPFFs and IPFFs. Inclusion criteria for outcome analysis was follow-up of 30 days and/or reoperation/death within 30 days. Patient demographics, treatment characteristics, and complications were compared between the PPFF and IPFF groups utilizing Fisher's exact and chi-squared tests.

Results: The PPPF group consisted of 198 patients, with 165 meeting inclusion criteria for outcome analysis. This is compared to 27 IPFF patients, with 17 available for outcome analysis. Patients with an IPFF were significantly older than PPPF patients (76.7 vs 70.42, P = 0.0183), but had similar body mass index (BMI), gender, and tobacco use. There was a significant difference in the number of hybrid fixation constructs between the 2 cohorts with 33.3% of the IPFFs being fixed using a nail-plate combination, compared to 25.3% in the PPFF fracture group (P = 0.0117). All hybrid IPFF constructs were performed within the last 5 years. The IPFF group had an implant failure rate of 18.8% compared to 7.1% in the PPFF group (P = 0.1283). However, none of the nail-plate hybrid constructs in the IPFF cohort failed. The major complication rate was not significantly different between PPFF and IPFF cohorts.

Conclusion: Patients who suffer IPFFs tend to be older than patients who suffer PPFFs. IPFFs are treated with hybrid fixation more often than the PPFFs at our institution. The lack of failure among these hybrid constructs, the increased failure rate of traditional constructs, and the older patient population in our IPFF cohort supports the need for more robust fixation in these complex fractures; however, further studies are needed to fully address this topic.

Table 1: Interprosthetic Femur Fractures Versus Periprosthetic Femur Fractures
[N (%) or Mean (SD)]

Demographics	**IPFF (n=27)**	**PPFF (n=198)**	**p-value**
Age	76.7 (9.69)	70.4 (13.25)	0.0183*
Female	21 (77.8%)	131 (66.2%)	0.2773
BMI			
Treatment Characteristics			
Fixation Method			
Revision Alone	3 (11.1%)	27 (13.6%)	
Locking Plate	10 (37%)	74 (37.4%)	
IMN	1 (3.7%)	41 (20.7%)	
Nail + Plate	9 (33.3%)	50 (25.3%))	
DFR	2 (7.4%)	5 (2.5%)	
Cerclage Wires Alone	2 (7.4%)	1 (0.5%)	0.0117*
Outcomes	**IPFF (n=17)**	**PPFF (n=168)**	
Unplanned Reoperations	6 [n=16] (37.5%)	44 (26.2%)	0.3795
Nonunion	2 [n=16] (12.5%)	9 (5.36%)	0.2456
Deep Infection	3 [n=16] (18.8%)	17 (10.1%)	0.3895
Implant Failure	3 [n=16] (18.8%)	12 (7.14%)	0.1283

*IPFF (Interprosthetic Femur Fracture); PPFF (Periprosthetic Femur Fracture); BMI (Body Mass Index); IMN (Intramedullary Nail); DFR (Distal Femur Replacement) *Denotes significance. 'Wilcoxon Two-Sample Test employed due to these variables being non-parametric*