

Alarming High Rates of Complications and Re-Fracture Among Patients with Early Periprosthetic Fracture Within 30-Days of Total Hip Arthroplasty

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INTRODUCTION:

Periprosthetic femur fractures (PPFx) are a devastating complication following primary total hip arthroplasty (THA). Our study compared outcomes of early postoperative PPFx within 30-days of THA to PPFx which occurred at later time points.

METHODS:

A large, all-payer national database was queried to identify patients undergoing primary THA between 2010 and 2022. Patients with an intra-operative fracture or who underwent THA for fracture or malignancy were excluded. Patients with a PPFx within 30-days of THA were matched based on age, sex, and comorbidity burden to three separate cohorts based on PPFx timing: 31-90 days (n=1,803), 91 days-1-year (n=1,330), and no fracture within 1-year (n=4,586) of THA. Univariate and multivariate regression analyses were utilized to evaluate outcomes at 90-days and 2-years following PPFx.

RESULTS:

Patients who sustained a PPFx within 30-days of primary THA demonstrated significantly greater rates of periprosthetic joint infection (PJI), transfusion, and any complication relative to 31-90 days, 91 days-1 year, and no fracture cohorts at 90-days post-operatively (all p-values <0.05). Patients with PPFx within 30 days demonstrated higher rates of subsequent PPFx and any revision at 2 years relative to 31-90 days (OR: 1.4, OR. 1.4, respectively), 91 days-1-year (OR: 3.6 and OR: 2.5, respectively), and no fracture (OR: 60.7 and OR: 53.3, respectively) cohorts (all p-values <0.001). Patients with PPFx within 30 days also demonstrated higher rates of PJI at 2 years relative to 31-90 day (OR: 1.4; p<0.001) and no fracture cohorts (OR: 6.8; p<0.001).

DISCUSSION AND CONCLUSION:

Patients who sustain early PPFx within 30 days following primary THA are at significantly greater risk for PJI at 90 days and revision at 2 years than their counterparts with PPFx at later timepoints. These findings highlight the morbidity of early PPFx and the importance of primary prevention in high-risk patient populations.

Table 1. Patient Demographics

Variable	Periprosthetic Fracture (N=1,803)	Periprosthetic Fracture (N=1,330)	Periprosthetic Fracture (N=4,586)	No Periprosthetic Fracture (N=4,586)	p-value
Age	68.5 (10.2)	68.5 (10.2)	68.5 (10.2)	68.5 (10.2)	0.999
Sex	Male: 1,021 (56.6%)	Male: 754 (56.7%)	Male: 2,387 (52.1%)	Male: 2,387 (52.1%)	0.001
Comorbidity Index	1.8 (1.2)	1.8 (1.2)	1.8 (1.2)	1.8 (1.2)	0.999

* p < 0.05 ** p < 0.001

Table 2. Outcomes Relative to Periprosthetic Fracture Within 90 Days vs. 31-90 Days vs. 91-365 Days and 2 Years Following First Instance of Periprosthetic Fracture

Variable	MATCHED TRIPLATES			
	N	90 Days	31-90 Days	p-value
90-DAY OUTCOME*				
Periprosthetic Joint Infection	1,803	1,803	1,803	0.001
Transfusion	1,803	1,803	1,803	0.001
Any Complication	1,803	1,803	1,803	0.001
2-YEAR OUTCOME**				
Periprosthetic Fracture	1,803	1,803	1,803	0.001
Revision	1,803	1,803	1,803	0.001
Any Revision	1,803	1,803	1,803	0.001

* p < 0.05

Table 3. Outcomes Relative to Periprosthetic Fracture Within 90 Days vs. 31-90 Days vs. 91-365 Days and 2 Years Following First Instance of Periprosthetic Fracture

Variable	MATCHED TRIPLATES			
	N	90 Days	31-90 Days	p-value
90-DAY OUTCOME*				
Periprosthetic Joint Infection	1,803	1,803	1,803	0.001
Transfusion	1,803	1,803	1,803	0.001
Any Complication	1,803	1,803	1,803	0.001
2-YEAR OUTCOME**				
Periprosthetic Fracture	1,803	1,803	1,803	0.001
Revision	1,803	1,803	1,803	0.001
Any Revision	1,803	1,803	1,803	0.001

* p < 0.05

Table 4. Outcomes Relative to Periprosthetic Fracture Within 90 Days vs. Patient-Related Periprosthetic Fracture Within 3 Years Post-Operatively, by 90 Days and 3 Years Following First Instance of Periprosthetic Fracture

Variable	MATCHED TRIPLATES			
	N	90 Days	3 Years	p-value
90-DAY OUTCOME*				
Periprosthetic Joint Infection	1,803	1,803	1,803	0.001
Transfusion	1,803	1,803	1,803	0.001
Any Complication	1,803	1,803	1,803	0.001
3-YEAR OUTCOME**				
Periprosthetic Fracture	1,803	1,803	1,803	0.001
Revision	1,803	1,803	1,803	0.001
Any Revision	1,803	1,803	1,803	0.001

* p < 0.05