

**Are Extreme Distal Periprosthetic Femur Fractures too Distal for Retrograde Intramedullary Nailing? A Multicenter Retrospective Cohort Study**

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**Purpose:** Our objective was to compare clinical and radiographic outcomes following retrograde intramedullary nailing (rIMN) of “extreme distal” periprosthetic femur fractures versus periprosthetic femur fractures proximal to the anterior flange.

**Methods:** This was a multicenter retrospective review of all patients treated for a periprosthetic distal femur fracture with rIMN. The primary outcome was reoperation for fixation failure or nonunion. Secondary outcomes included infection, delayed union, and overall reoperation rate. Outcomes were compared between patients with “extreme distal” periprosthetic femur fractures (ED), defined as fractures at or distal to the anterior flange, and those with fractures proximal to the anterior flange (Su1).

**Results:** 59 patients met inclusion criteria, including 37 patients with ED fractures and 22 patients with Su1 fractures. Demographic data and fracture characteristics are shown in Table 1. Both groups had a similar number of points of fixation in the distal segment (Su1: 3.2 ± 1.4, ED: 3.1 ± 0.8, P = 0.663) and of patients allowed immediate weightbearing postoperatively (Su1: 27%, ED: 40%, P = 0.454). There were no cases of acute fixation failure, and no statistically significant differences in nonunion (Su1: 13.6%, ED: 5.6%, P = 0.561), delayed union (Su1: 0%, ED: 5.6%, P = 0.701), or overall reoperation rate (Su1: 27%, ED 16.7%, P = 0.526) between groups. There were significantly more infections in the Su1 group (18% vs 0%, P = 0.034), despite a lower rate of open fractures than the ED group. Overall, 40% of patients were ambulating independently at final follow-up (Su1: 36.8%, ED: 42%, P = 0.953).

**Conclusion:** Retrograde intramedullary nailing of extreme distal periprosthetic femur fractures appears safe and effective, with favorable complication rates compared to more proximal fractures. Surgeons treating these fractures should consider this treatment strategy, even in the most distal fractures.

**Table 1: Patient Demographics, Fracture Characteristics and Complications: Su1 vs. Extreme Distal**

	Su 1 (n = 22)	ED (n = 37)	All (n = 59)	P
Age (years)	74.3 (IQR 70.1-79.7)	75.1 (IQR 65-81.1)	74.8 (IQR 66-81.1)	0.7698
BMI	36.8 (IQR 29.2-41.1)	33.2 (IQR 26.7-36.1)	34.5 (IQR 27.3-39.7)	0.253
Follow-up (weeks)	47.5 (IQR 16-50)	31.3 (IQR 16-36)	37.3 (IQR 16-44)	0.1865
Male	2 (9.1%)	10 (27%)	12 (20%)	0.1866
Smoking	1 (4.5%)	6 (16%)	7 (11.9%)	0.3553
Mechanism				
GLF	20 (91%)	31 (84%)	51 (87%)	0.7040
High energy (ie, MVC)	1 (4.5%)	4 (11%)	5 (8.5%)	0.7246
Open Fracture	1 (4.5%)	4 (11%)	5 (8.5%)	0.7246
Su Class				
1	22 (100%)	N/A	22 (37%)	
2	N/A	14 (38%)	14 (23.7%)	
3	N/A	23 (62%)	23 (39%)	
Comminution	13 (59%)	20 (54%)	33 (56%)	0.9158
Distal Fixation Points	3.2 +/- 1.4 (range 2-4)	3.1 +/- 0.8 (range 2-4)	3.1 +/- 1.1 (2-4)	0.6633
WBAT	6 (27%)	15 (40%)	21 (36%)	0.4544
<b>Outcomes</b>				
Nonunion	3 (13.6%)	2 (5.6%)	5 (8.6%)	0.5607
Delayed Union	0 (0%)	2 (5.6%)	2 (3.4%)	0.7013
Fixation Failure	0 (0%)	0	0	
Infection	4 (18%)	0	4 (6.9%)	<b>0.0342</b>
Any Reoperation	6 (27%)	6 (16.7%)	12 (20.7%)	0.5264
Independent WB at final follow-up	7(36.8%)	13 (42%)	20 (40%)	0.9526

POSTER ABSTRACTS

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device they wish to use in clinical practice.