

Δ The Effect of Knee Flexion Contracture on Outcomes of Distal Femur Fractures

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Background/Purpose: Injuries about the knee may result in stiffness. The development of a flexion contracture is common after distal femur fracture, yet the effect of a flexion contracture on outcomes has never been evaluated. The purpose of this study is to compare the demographics and validated outcomes of patients with and without a flexion contracture after operative treatment for distal femur fractures.

Methods: As part of a multicenter randomized trial of adult patients with A1-3 or C1 (undisplaced joint injuries) distal femur fractures, data on contractures were gathered prospectively. Patients were treated by intramedullary (IM) nail or locked plate. Demographic data, ambulatory ability, and validated outcomes including SMFA (Short Musculoskeletal Function Assessment), Bother Index, and EQ health index were obtained at 3, 6, and 12 months postoperatively. Range of motion was tested at each interval. Flexion contractures were defined by a lack of full extension and were documented in degrees. A contracture was defined as 10° to account for measurement variation and be certain that a noticeable

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See pages 47 - 108 for financial disclosure information.

contracture was present. Comparisons were made using a Fisher exact test for categorical variables and t tests for continuous variables.

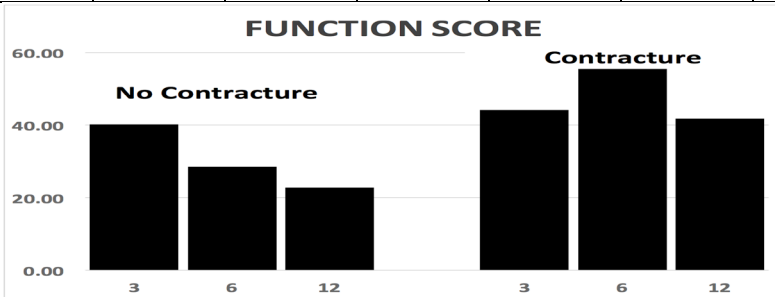
Results: 126 patients were enrolled and followed for >6 months. Of these, 98 were examined for contracture in person and had data at 3 months, 88 at 6 months, and 73 at 1 year. Patients who filled out outcome forms but were not examined in person were excluded. There were 55 men and 43 women aged 16 to 90 years (mean 51). The average ISS was 12.6 (range, 9-43) and 24 (24%) were open. A flexion contracture of 10° was present in 16% at 3 months and 14% at 1 year. Patients did not show improvement between 3 months and 1 year. There was no difference in contracture development between patients treated with nails versus plates ($P = 1$), open versus closed fractures ($P = 0.24$), or by gender ($P = 0.5$). Patients who developed a contracture were slightly older than those who did not, 65 ± 14 versus 52 ± 19 ($P = 0.01$). Outcome data are summarized in the table. Patients without a contracture had better outcomes; the SMFA score, walking distance, and stair climbing all reached statistical significance. Patients with contracture could walk less than 5 blocks and those without could walk more than 10 or were unlimited. Flexion contracture was not associated with a difference in flexion at any time point. Finally, patients with a flexion contracture did not show improvement in their SMFA score over time while those without a contracture showed steady improvement (bar graph: 3,6, and 12 months).

Conclusion: Flexion contracture after distal femur fracture occurs in approximately 15% of patients, is typically present by 3 months, and does not improve by 1 year. Outcomes for patients with contractures are worse than in those without contractures and minimal improvement is seen over the first year. Walking and stair climbing are substantially diminished.

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One Year Results

Group	SMFA	Bother Index	EQ-Health State	Avg. Flexion	Walking (1 – 6) 1 best	Stairs (1 – 5) 1 best
Contracture	41.8	35.8	0.6	107°	4.1	3.4
No Contracture	22.8	25.1	0.8	118°	2.6	2.4
P value	<i>0.038</i>	0.29	0.12	0.41	<i>0.007</i>	<i>0.017</i>



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