

Comparison between DFLP and Retrograde Nailing in Management of Distal Femoral Fracture at a Tertiary Care Centre

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ABSTRACT

Background: Distal femur fractures are relatively rare injuries accounting for approximately 1% of fractures in the elderly. The aim of surgical management in these frail patients should be considered similar to those with a proximal femur fracture that is a quick surgical procedure that allows early weight bearing and mobilisation to avoid the complications of prolonged bed rest. Hence; the present study was undertaken for comparing the treatment outcome between distal femoral locking plates (DFLP) and retrograde nailing in management of distal femoral fracture.

Materials & Methods: A total of 30 patients were enrolled in the present study and were broadly divided into two study groups. One group included patients treated with DFLP while other group included patients managed with retrograde nailing. Complete demographic details and clinical history of all the patients was obtained. Clinical and radiographic evaluation was done in all the patients. Treatment was done according to respective group and post-operative care was provided. Follow-up was done and Neer et al criteria were used for assessing the outcome.

Results: Mean fracture union time was 18.36 weeks among the patients of the DFLP group and was 14.38 weeks among the patients of the retrograde nailing group respectively. Significant results were obtained while comparing the mean

fracture union time among the patients of the two study groups. While comparing the clinical and radiological outcome, it was observed that excellent results were obtained in 53.33 percent of the patients of the DFLP group and in 46.67 percent of the patients of the retrograde nailing group.

Conclusion: Both DFLP and Retrograde intramedullary nail fixation are effective method for treating fractures of distal femur. However; retrograde nailing was slightly better in terms of faster fracture union time.


Key Words: Distal Femoral, Retrograde Nailing.

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INTRODUCTION

Distal femur fractures are relatively rare injuries accounting for approximately 1% of fractures in the elderly. They have bimodal age distribution; young patients as a result of high-energy injuries and elderly patients after simple falls. Despite affecting the same anatomical location as young patients, fractures in the elderly pose different challenges due to osteoporotic bone and the overall patients' medical condition.¹⁻³ The diversity of surgical options for the management of distal femoral fractures reflects the challenges inherent in these injuries. These fractures are frequently comminuted and intra-articular, and they often involve osteoporotic bone, which makes it difficult to reduce and hold them while maintaining joint function and overall limb alignment. Surgery has become the standard of care for displaced fractures and for patients who must obtain rapid return of knee function.^{4,5}

The aim of surgical management in these frail patients should be considered similar to those with a proximal femur fracture that is a quick surgical procedure that allows early weight bearing and mobilisation to avoid the complications of prolonged bed rest.⁶ Hence; the present study was undertaken for comparing the treatment outcome between distal femoral locking plates (DFLP) and retrograde nailing in management of distal femoral fracture.

MATERIALS & METHODS

The present study was conducted in the Department of Orthopaedic Surgery, LLRM Medical College, Meerut, Uttar Pradesh (India) and it included comparison of outcome of DFLP and retrograde nailing in patients with distal femoral fractures. Ethical approval was obtained from institutional ethical committee

and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 30 patients were enrolled in the present study and were broadly divided into two study groups. One group included patients treated with DLFP while other group included patients managed with retrograde nailing. Complete demographic details and clinical history of all the patients was obtained. Clinical and radiographic

evaluation was done in all the patients. Treatment was done according to respective group and post-operative care was provided. Follow-up was done and Neer et al criteria were used for assessing the outcome.⁷

All the results were analysed by SPSS software. Chi-square test, student test and Mann-Whitney u test were used for assessment of level of significance.

Table 1: Age-wise distribution of patients

Age group (years)	DLFP group		Retrograde nailing group	
	Number of patients	Percentage	Number of patients	Percentage
18 to 30	0	0	1	6.67
31 to 40	3	20	3	20
41 to 50	4	26.67	3	20
51 to 60	8	53.33	8	53.33
Total	15	100	15	100
Mean age (years)	47.5 ± 5.38		46.9 ± 4.25	

Table 2: Gender-wise distribution of patients

Gender	DLFP group		Retrograde nailing group	
	Number of patients	Percentage	Number of patients	Percentage
Males	10	66.67	11	73.33
Females	5	33.33	4	26.67
Total	15	100	15	100

Table 3: Distribution of patients according to side involved

Side involved	DLFP group		Retrograde nailing group	
	Number of patients	Percentage	Number of patients	Percentage
Right	8	53.33	9	60
Left	7	46.67	6	40
Total	15	100	15	100

Table 4: Mean fracture union time

Mean union time	DLFP group	Retrograde nailing group	p-value
Mean (weeks)	18.36	14.38	0.023 (Significant)
SD (weeks)	4.36	4.39	

Table 5: Outcome

Outcome	DLFP group		Retrograde nailing group	
	Number of patients	Percentage	Number of patients	Percentage
Excellent	8	53.33	7	46.67
Satisfactory	3	20	4	26.67
Unsatisfactory	3	20	3	20
Failure	1	6.67	1	6.67
Total	10	100	10	100

RESULTS

In the present study, a total of 30 patients with distal femur fractures were enrolled and were broadly divided into two study groups with 15 patients in each group. Mean age of the patients of the DLFP group and retrograde nailing group was 47.5 years and

46.9 years respectively. Majority of the patients of both the study groups belonged to the age group of 51 to 60 years. 66.67 percent of the patients of the DLFP group and 73.33 percent of the patients of the retrograde nailing group were males. Right side involvement occurred in 53.33 percent of the patients of the DLFP

group and 60 percent of the patients of the retrograde nailing group respectively. In the present study, mean fracture union time was 18.36 weeks among the patients of the DLFP group and was 14.38 weeks among the patients of the retrograde nailing group respectively. Significant results were obtained while comparing the mean fracture union time among the patients of the two study groups. While comparing the clinical and radiological outcome, it was observed that excellent results were obtained in 53.33 percent of the patients of the DLFP group and in 46.67 percent of the patients of the retrograde nailing group. Satisfactory results were obtained in 20 percent of the patients of the DLFP group and in 26.67 percent of the patients of the retrograde nailing group. Failure occurred in 1 patient each of both the study groups.

DISCUSSION

Retrograde nailing is an established management option for these fractures. Previous studies on the outcome of patients managed by retrograde nailing often included both young patients with high-energy fractures and elderly patients with osteoporotic fractures. However, the differences in patient and fracture characteristics between these two groups make them two distinct injuries requiring a separate analysis.⁷⁻⁹ Hence; the present study was undertaken for comparing the treatment outcome between distal femoral locking plates (DFLP) and retrograde nailing in management of distal femoral fracture.

In the present study, a total of 30 patients with distal femur fractures were enrolled and were broadly divided into two study groups with 15 patients in each group. Mean age of the patients of the DLFP group and retrograde nailing group was 47.5 years and 46.9 years respectively. Majority of the patients of both the study groups belonged to the age group of 51 to 60 years. 66.67 percent of the patients of the DLFP group and 73.33 percent of the patients of the retrograde nailing group were males. Right side involvement occurred in 53.33 percent of the patients of the DLFP group and 60 percent of the patients of the retrograde nailing group respectively.

Virk JS et al studied the functional and radiological outcome of distal femoral fractures in skeletally mature patients treated by open reduction and internal fixation with distal femur locking plate. This was a prospective study conducted from January 2012 to March 2014 at the Government Medical College and Hospital (GMCH) with a 2 year follow-up. Twenty five skeletally mature patients with post-traumatic distal femur fractures were included. Patients with open grade 3B and 3C distal femur fractures, according to the Gustilo- Anderson classification and pathological distal femur fractures were excluded from the study. Patients with any fracture other than the distal femur in the ipsilateral limb were excluded from the study. Follow-up at 3 months, 6 months, 1 year and 2 years was carried out and evaluation was done according to the Neer scoring system. The statistical data analysis was carried out using SPSS version 20 (IBM, Chicago, USA). The p-value <0.05 was considered significant. Following all principles of fracture reduction, union was achieved in all patients with mean time to radiological union being 19 weeks. The mean Range of Motion (ROM) was 109 degrees with 20 patients having a Neer score graded as excellent to satisfactory. Their study had nine cases which required additional surgeries. Out of these, all nine cases required bone grafting; three also required antibiotic cement bead insertion initially. Three patients developed complications in

the form of infection (two cases) and mal-union (one case) during the course of our study, but were completely treated by the end of the study. They concluded that positive results can be obtained by distal femur locking plate alone as it is the main implant of choice for distal femur fractures of all varieties. Best outcome is expected if fracture fixation is done following all the basic principles of fracture fixation and taking benefit of the mechanical properties of a locking plate.⁶

In the present study, mean fracture union time was 18.36 weeks among the patients of the DLFP group and was 14.38 weeks among the patients of the retrograde nailing group respectively. Significant results were obtained while comparing the mean fracture union time among the patients of the two study groups. While comparing the clinical and radiological outcome, it was observed that excellent results were obtained in 53.33 percent of the patients of the DLFP group and in 46.67 percent of the patients of the retrograde nailing group. Satisfactory results were obtained in 20 percent of the patients of the DLFP group and in 26.67 percent of the patients of the retrograde nailing group. Failure occurred in 1 patient each of both the study groups. Ramanand M et al concluded that LCP plating proved to be the better choice than DFN for treating distal femur fracture with respect to surgical duration, mobilization, fracture union, weight bearing, range of motion and complications.¹⁰

Kumar SK et al concluded that distal femoral locking plate in the treatment of choice in the management of comminuted distal femoral fractures especially type A fractures where they had found higher Neer score. DFLP also prevents compression of periosteal vessels. It may not completely solve the age old problems associated with any fracture like non-union and malunion, but is a valuable technique in management of these fractures. However, in type C fracture the outcome is poorer, but still DFLP remains the implant of choice for type C fractures, through complications like knee stiffness and extension lag was encountered in a few cases. DFLP showed better result than DCS and angle blade plate.¹¹

CONCLUSION

From the above results, the authors conclude that both DLFP and Retrograde intramedullary nail fixation are effective method for treating fractures of distal femur. However; retrograde nailing was slightly better in terms of faster fracture union time.

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