

Comparison Of Functional Outcome Of Distal Femur Fractures Treated With Distal Femur Locking Plate Versus Dynamic Condylar Screw

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ABSTRACT

Background: Distal femoral fractures are associated with high energy trauma and osteoporotic bones in the elderly. The present study was conducted to compare functional outcome of distal femur fractures treated with distal femur locking plate versus dynamic condylar screw.

Materials & Methods:

Results: Group I had 20 males and 24 females and group II had 25 males and 19 females. Average time to union (months) was 3.5 and 3.9, average range of flexion was 114.6 degrees and 110.3 degrees, knee score was 95.2 and 90.4 and functional score was 91.7 and 86.3 in group I and II respectively. The difference was significant ($P < 0.05$). In group I and group II, Muller type A1 was seen in 20 and 14, A3 in 12 and 18, C1 in 7 and 8 and C2 in 5 and 4 respectively. Complications were wound infection in 2 and 4 and non-union in 3 and 6. HSS was excellent in 34 and 28, good in 8 and 10, fair in 2 and 6 respectively.

Conclusion: Distal femur locking plate was best choice for management of distal femur fractures.

Key words: distal femur fractures, dynamic condylar screw, distal femur locking plate

Introduction

Distal femoral fractures are associated with high energy trauma (in the youngsters) and osteoporotic bones in the elderly.¹ High energy injuries tend to occur in young males, whereas low energy injuries occur commonly in elderly females. These fractures often are unstable and comminuted. They are complex injuries that can be difficult to manage. Distal femoral fractures account for about 4% to 7% of all femoral fracture.²

Surgical treatment can either be retrograde intramedullary nail fixation or be plate fixation, with plate fixation having a wide indication for

various fractures types.³ Regarding plate fixation, basic fixation is generally recommended to achieve absolute stability using lag screws in simple fractures; however, lag screw fixation cannot be performed in transverse fractures. Moreover, it is impossible to achieve absolute stability with rigid internal fixation in comminuted fractures. In such cases, it is necessary to use a locking plate as a bridging plate to fix the fracture site.⁴

In 1970, the AO published its first review of distal femoral fractures treated according to their principles of anatomical reduction and stable internal fixation; most of their reviewed

patients achieved good or excellent results. However, surgical treatment was complicated by infection and metal failure in the form of breakage of the implant or packing out of the screws.^{5,6} The present study was conducted to compare functional outcome of distal femur fractures treated with distal femur locking plate versus dynamic condylar screw.

Materials & Methods

The present study comprised of 88 patients of distal femur fractures of both genders. All gave their written consent for the participation in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 44 each. Group I were treated with distal femur locking plate and group II with dynamic condylar screw. Parameters such as muller classification, HSS score, average time to union (months), average range of flexion (degree), knee score (mean), functional score (mean) and complications were recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Distribution of patients

Groups	Group I	Group II
Method	DFLP	DCS
M:F	20:24	25:19

Table I shows that group I had 20 males and 24 females and group II had 25 males and 19 females.

Table II Assessment of parameters

Parameters	Group I	Group II	P value
Average time to union (months)	3.5	3.9	0.05
The average range of flexion (degree)	114.6	110.3	0.12
Knee score (mean)	95.2	90.4	0.04
Functional score (mean)	91.7	86.3	0.02

Table II shows that average time to union (months) was 3.5 and 3.9, average range of flexion was 114.6 degrees and 110.3 degrees, knee score was 95.2 and 90.4 and functional

score was 91.7 and 86.3 in group I and II respectively. The difference was significant (P< 0.05).

Table III Muller type, HSS and complications

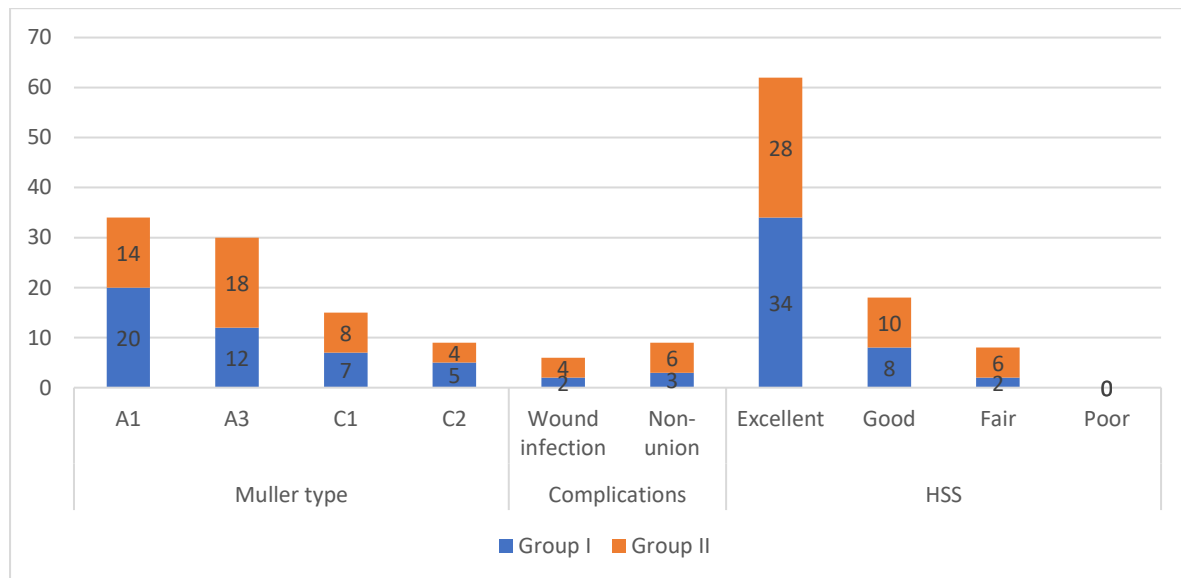
Parameters	Variables	Group I	Group II	P value
Muller type	A1	20	14	0.93
	A3	12	18	
	C1	7	8	
	C2	5	4	
Complications	Wound infection	2	4	0.05
	Non- union	3	6	0.04
HSS	Excellent	34	28	0.05
	Good	8	10	
	Fair	2	6	

	Poor	0	0	
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Table II, graph I shows that in group I and group II, Muller type A1 was seen in 20 and 14, A3 in 12 and 18, C1 in 7 and 8 and C2 in 5 and 4 respectively. Complications were wound

infection in 2 and 4 and non-union in 3 and 6. HSS was excellent in 34 and 28, good in 8 and 10, fair in 2 and 6 respectively.

Graph I Muller type, HSS and complications



Discussion

Distal femoral fractures account for about 4% to 7% of all femoral fracture. These fractures have got wide variety of fracture patterns and they are commonly associated with injuries such as open wounds, patellar fractures and ligament disruption.⁷ These serious injuries have the potential to produce significant long-term disability especially when they are associated with extensive articular cartilage damage, marked bone comminution, and severe soft tissue injury.⁸ Distal femur fractures can be treated by traditional plating techniques (blade plate, Dynamic Condylar Screw, non-locking condylar buttress plate), antegrade nailing fixation, retrograde nailing, sub muscular locked internal fixation and external fixation.⁹ The present study was conducted to compare functional outcome of distal femur fractures treated with distal femur locking plate versus dynamic condylar screw.

We found that group I had 20 males and 24 females and group II had 25 males and 19 females. Average time to union (months) was 3.5 and 3.9, average range of flexion was 114.6 degrees and 110.3 degrees, knee score was 95.2 and 90.4 and functional score was 91.7 and 86.3 in group I and II respectively. Kumar et al¹⁰ evaluated the advantages, disadvantages and possible complications associated with fixation of distal femur fracture with distal femur locking plate versus dynamic condylar screw. In Type A fractures DCS produced better functional results when compare to DLFP in our study. Infection, knee stiffness and mal alignment of fractures were the common complication we encountered in both DLFP and DCS, which could be tackled by surgical expertise, meticulous soft tissue handling, judicious use of antibiotics and vigorous early knee mobilization.

We found that in group I and group II, Muller type A1 was seen in 20 and 14, A3 in 12 and

18, C1 in 7 and 8 and C2 in 5 and 4 respectively. Nayak et al¹¹ evaluated treatment outcomes of minimally invasive plate osteosynthesis (MIPO) for distal femoral fractures in 31 patients. 22 male and 9 female consecutive patients aged 21 to 65 (mean, 42) years underwent minimally invasive plate osteosynthesis using a locking compression plate (LCP) for distal femoral fractures. The causes of injury were vehicular accidents (n=24), falls (n=6), and assault (n=1). According to the AO classification, the fractures were classified as types A1 (n=10), A2 (n=7), and A3 (n=14). Most fractures were closed; 3 were Gustilo type-II fractures. Clinical and functional outcomes were assessed using the Knee Society Scores. The mean operating time was 70 minutes. The mean length of hospital stay was 9 (6–14) days. The mean time to union was 3.7 months. The mean follow-up period was 18 (14–26) months. At the one-year follow-up, 29 of the patients had good or excellent outcomes.

We found that complications were wound infection in 2 and 4 and non-union in 3 and 6. HSS was excellent in 34 and 28, good in 8 and 10, fair in 2 and 6 respectively. Markmiller et al¹² evaluated the functional and radiologic outcomes after stabilization of distal femoral fractures using the distal femoral nail and a less invasive stabilization system to determine if the new implants are superior to other implants (especially the condylar blade plate) regarding the rates of axial deviation, non-union, and infection and if one of these new implants (Less Invasive Stabilization System, or distal femoral nail) is superior to the other. Two groups, each with 16 patients, were documented prospectively and the results were compared. To record the findings objectively, the Lysholm-Gillquist score was used. A conversion procedure was done in two patients in the plate group and one patient of the nail group. At the 1-year follow up mobility of the knee was on average 110 degrees in the plate group and 103 degrees in the nail group.

The limitation the study is small sample size.

Conclusion

Authors found that distal femur locking plate was best choice for management of distal femur fractures.

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