

Incidence of Complications Following Management of Distal Femur Fracture Using Locking Compression Plate: A Longitudinal Study

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Conflict of interest: Nil

Abstract:

Introduction: Locked plating (LP) of distal femoral fractures has become very popular. Despite technique suggestions from anecdotal and some early reports, knowledge about risk factors for failure, nonunion (NU), and revision is limited.

Objective: To study the incidence of complications following management of distal femur fracture using locking compression plate

Methodology: The study was conducted on patients of distal femur fracture treated by locking compression plate in tertiary care hospital during the study period of January 2018 to June 2019

Results: Out of 42 patients with distal femoral fracture in our study, majority of them i.e. 12(28.6%) were from 41-50 years. Mullers type A2 was commonest i.e. 11(26.2%) followed by A3 in 10(23.8%) and A1 in 8(19%). Only in 10 cases associate implants were used. Shortening of leg was seen in 2 patients i.e. 4.8%. Varus was reported in 2 cases i.e. 4.8%. Prevalence of infection was reported in 3 patients i.e. 7.1%. Majority of the patients achieved knee flexion above 110 degrees in 22 i.e. 52.4%.

Conclusion: Incidence of shortening of leg was 4.8%. Incidence of Varus deformity was 4.8%. Incidence of infection was 7.1%.

Keywords: Distal femur fractures, locking compression plate, complications, incidence.

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Introduction

The incidence of distal femur fractures is approximately 37 per 1, 00,000 person-years. Distal femoral fractures are much less common than hip fractures and account for about 4-7% of all femoral fractures. If fractures of the hip are excluded, 31% of femoral fractures involve the distal portion. [1]

Distal femur fractures remain difficult fractures to treat successfully as they are often comminuted, unstable, with intra-articular extension and associated with severe soft tissue injury to the quadriceps mechanism and ligament disruption of knee joint. Both articular and extraarticular distal femur fractures require anatomical reduction in order to restore the functional and mechanical axis of the extremity. Also, a stable internal fixation is required in order to start early range of movements to avoid stiffness of knee joint. Distal femoral fractures mainly arise from two different injury mechanisms. They are often caused by high energy trauma mainly sustained in road traffic accidents. Open injuries with considerable comminution of

condyles and metaphysis are frequently seen, as is low energy trauma, relating to elderly patients with severe osteoporosis frequently seen as periprosthetic fracture. In high-energy trauma, the problem of restoring the function in a destroyed knee joint persists. Complex knee ligament injuries frequently occur additionally to extensive cartilage injuries. In elderly patients, extreme osteoporosis represents a particular problem for anchoring the implant. [2]

Distal femoral fractures represent less than 1% of all fractures and 4-6% of all femoral fractures. [3] These fractures have a tendency of being unstable [AO type 33A2, 33A3, 33C2 and 33C3] with intra-articular comminution. [4] Regardless of the immense advancements in implant designs and surgical techniques for treating these fractures, the difficulties in fracture healing and high rate of complications with subsequent poor outcomes are still encountered. [5] Currently there is no consensus regarding optimal treatment for these fractures. DFLCP is helpful in the management of

unstable fractures by virtue of offering multiple points of fixation and ability to resist varus collapse. As high as 32% of these patients may require revision surgery to achieve satisfactory outcomes. [6] The causes and risk factors for these revision surgeries remain ambiguous. Few studies mention comminution, fracture type, osteoporosis, poor quality of reduction and unstable fixation due to poor application of the principles of locked plating system as the risk factors for poor outcome.

Hence the present longitudinal study was carried out to study the incidence of complications following management of distal femur fracture using locking compression plate

Objective: To study the incidence of complications following management of distal femur fracture using locking compression plate

Source of data: The study was conducted on patients of distal femur fracture treated by locking compression plate in tertiary care hospital during the study period January 2018 to June 2019.

It's a longitudinal study carried out in department of orthopedics at Tertiary care and rural hospital, Latur during the study period from January 2018 to June 2019 involving 42 cases.

Method of collection of data:

We will prospectively follow up 42 cases of Distal Femur fractures treated with LCP during 18-month period in our hospital. Patients with distal femur fracture are admitted and examined according to protocol both clinically and radiologically. Patient will be clinically and radiologically evaluated pre operatively and post operatively. Fracture care will be provided by trained orthopaedic surgeon at our hospital. The patient will be assessed up regularly by clinical examination Neers' scoring and X rays taken immediately after operation, at 6 weeks, 12 weeks and 24 weeks after surgery.

Inclusion criteria:

- All patients with distal femur fractures treated with LCP
- All patients age >18years
- Open distal femur fractures up to type A, B and C

Exclusion criteria:

- Patients of age less than 18 years
- Open fractures type III B and C
- Pathological Fractures
- Associated tibial plateau fractures
- Nonunion and Delayed union

Results

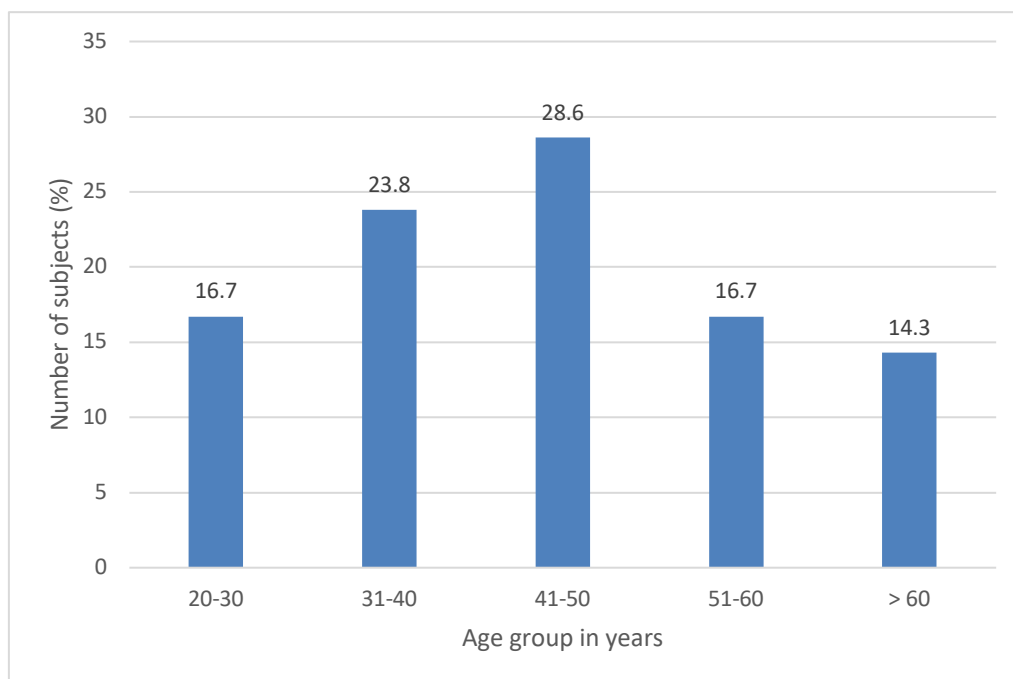


Figure 1: Distribution according to age

Out of 42 patients with distal femoral fracture in our study, majority of them i.e. 12(28.6%) were from 41-50 years followed by 10 i.e. 23.8% were from 31-40 years, 7 each i.e. 16.7% from 20-30- and 51-60-years age group

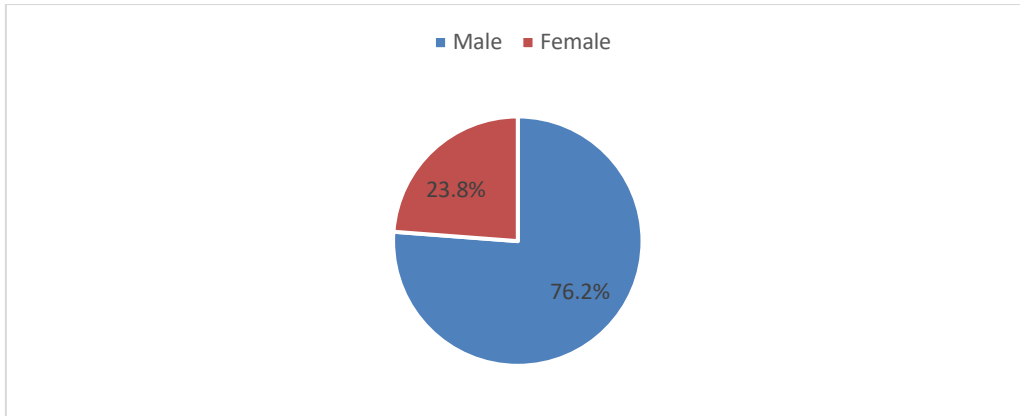


Figure 2: Distribution according to gender

In our study, there were 32 males (76.2%) and 10 (23.8%) females. Male preponderance was seen with male to female ratio as 3.2:1

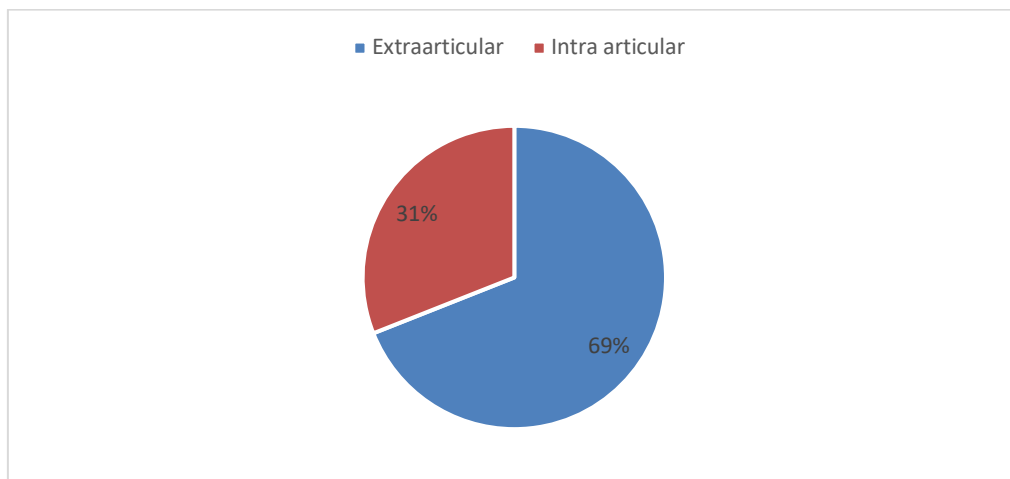


Figure 3: Distribution according to type of fracture

In our study, more commonly involved was extraarticular in 29 (69%) and in 13 i.e. 31% it was intraarticular type

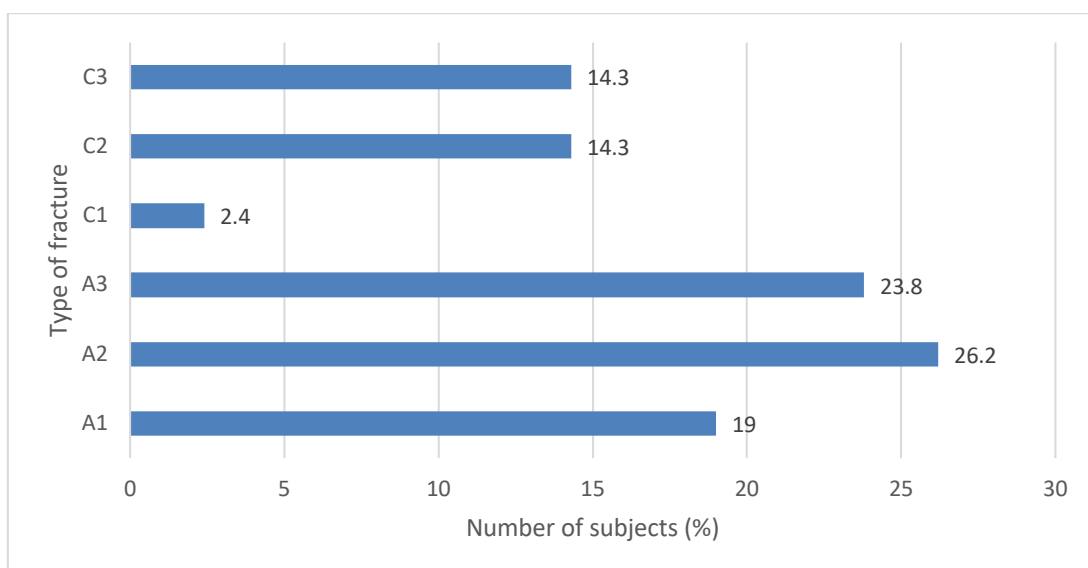


Figure 4: Distribution according to Mullers type fracture

In our study, mullers type A2 was commonest i.e. 11(26.2%) followed by A3 in 10(23.8%) and A1 in 8(19%)

Table 1: Distribution according to post op complications

		Frequency	Percent
Shortening	No	40	95.2
	Yes	2	4.8
Angulation	No	40	95.2
	Varus	2	4.8
	Valgus	0	0
Infection	No	39	92.9
	Yes	3	7.1
Movement restriction	Flexion	14	33.3
	Extension lag	3	7.1
	No	25	59.5
Knee flexion	<90	7	16.3
	90-110	13	31
	>110	22	52.4
Extensor lag	No lag	39	92.8
	0 to 5	0	0
	6 to 10	2	4.8
	> 10	1	2.4

Shortening of leg was seen in 2 patients i.e. 4.8%. Varus was reported in 2 cases i.e. 4.8%. Prevalence of infection was reported in 3 patients i.e. 7.1%. Infection occurred in 2 patients with compound fractures and in one patient with closed fracture. Movement restriction post operatively was seen in 17 patients. Flexion was seen in 14(33.3%) and extension lag in 3 i.e. 7.1% patients.

Majority of the patients achieved knee flexion above 110 degrees in 22 i.e. 52.4%, followed by 13 i.e. 31% between 90-110 and 7(16.3%) below 90 degrees. In our study, we observed extensor lag in only 3 patients. Out of these 3 patients, lag was between 6-10 degrees in 2 i.e. 4.8% patients and more than 10 degrees in 1(2.4%) case.

Discussion

Age and gender distribution:

In our study, out of 42 patients with distal femoral fracture in our study, majority of them i.e. 12(28.6%) were from 41-50 years followed by 10 i.e. 23.8% were from 31-40 years, 7 each i.e. 16.7% from 20-30- and 51-60-years age group. In our study, there were 32 males (76.2%) and 10 (23.8%) females. Mean age in our study was found to be 45.79±14.73 years.

In our study, male preponderance was seen with male to female ratio as 3.2:1. In our study, out of 32 males, majority i.e. 10(31.3%) were from 31-40 years age followed by 9(28.1%) from 41-50 and 6(18.7%) from 20-30 years age group. Out of 10 females, majority i.e. 4(40%) were from 51-60 years age followed by 3(30%) from 41-50 and 2(20%) from above 60 years age group.

SK Venkatesh Gupta et al [8] in 2015 conducted study which is a hospital based prospective study centered in orthopedic department, Mamata General Hospital, Khammam. All cases were fresh, 78 patients were males and 22 patients were females. The median age was 47 years ranging from 20-70 years.

Pradeep Patil et al [9] in 2016 from Maharashtra conducted study with 30 patients with closed fracture lower end of femur. The duration of follow up ranged from 6 months to 24 months. 70% were males & 30% were females and they belonged to 17-75-year age group.

Rajani Ranjanet al [10] conducted a prospective study was done during June 2012 to July 2016. Total 28 patient were enrolled in our study. There were 21 male and 7 females. The age range was from 21 to 68 years.

Mode of injury

Commonest mode of injury in our study was Road traffic accidents in 34 patients i.e. 81% and in 8(19%), it was fall. Almost 79% fractures in our study were reported amongst males in the 25-45 years age group predominantly.

Most of our patients were seen on the day of injury

Winqvist et al [11] also had 77% of cases because of motor vehicular accidents. This observation by various authors implies that fracture shaft femur is usually a result of high energy trauma. So, it is commonly associated with other injuries.

White et al [12] observed 76% of his cases were associated with RTA injuries.

Table 2: Comparison of complications with other studies

	Non-union	Shortening	Angulation	Infection	Movement restriction	ROM (degrees)
Our study results	7.1%	4.8%	4.8%	7.1%	33.3%	98.5±7.59
Kregor et al [13]	2	1	4.5	3		2-103
Schandelmaier et al [2]	-	-	17.5%	1.9	-	104
Muller et al [5]	17%	6%	2%	5	10%	4-112
Markmaier et al [14]	15	2%	-	5.3%	-	0-110
Yeap et al [15]	9%	3%	-	18.2%	-	1-107

Conclusion:

- Incidence of shortening of leg was 4.8%.
- Incidence of Varus deformity was 4.8%.
- Incidence of infection was 7.1%.
- Movement restriction post operatively was seen in 17 patients. Flexion was seen in 14(33.3%) and extension lag in 3 i.e. 7.1% patients.

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