

FUNCTIONAL OUTCOME OF DISTAL FEMORAL FRACTURES AND THEIR MANAGEMENT

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Abstract

Background: Fractures of distal end of femur are complex injuries which are difficult to manage. These fractures often are unstable and comminuted. Despite advances in surgical techniques and improvement in implants, treatment of distal femoral fractures remains a challenge in many situations. This study was done to analyse the functional outcome and this management of distal femoral fractures.

Material & Methods: This study has been done between August 2008 to March 2010 on patients coming to Orthopaedics Department at Jawaharlal Nehru Hospital and Research Center, Bhilai. It is a prospective study which includes 25 patients with 10 Type A, 7 Type B and 8 Type C fractures of distal femur after fulfilling the inclusion and exclusion criteria.

Results: Mean age of 47.08 years with sex incidence of 3.17:1(M:F). Mode of injury was RTA in 16, simple fall in 6, fall from height in 2 and railway track accident in 1 patient. There were 5-A1, 1-A2, 4-A3, 3-B1, 1-B2, 3-B3, 1-C1, 4-C2 and 3-C3 fractures. Results were found to be excellent in 17, good in 1, moderate in 3 and poor in 4 patients.

Conclusion: We conclude that minimally invasive surgical techniques and with the availability of locking type of plates distal femoral fractures can now be dealt with more precessions and more satisfactory results can be produced.

Keywords: Distal fractures, Muller Classification, Management, Femoral fractures

Introduction:

Advances in mechanisation and increase in the speed of motor vehicles have been accompanied by an increase in the number and severity of fractures; those in distal part of femur are no exception.

Distal femoral fractures often are unstable and comminuted and tend to occur in either elderly or multiply injured patients. Because of the proximity of these fractures to the knee joint, regaining full knee motion and function may be difficult. (1)

Distal femoral fractures involving 9-15cm from the distal articular surface are much less common than hip fractures and account for about 7% of all femoral fractures. If fractures of hip are excluded, 31% of femoral fractures involve the distal portion. (2)

There are various treatment options available for the management of these injuries. Despite the advances in techniques and improvement in surgical implants, treatment of distal femoral fractures remains a challenge in many situations. Anatomical reduction of articular surface, stable internal fixation with minimal soft tissue stripping, restoration of limb alignment and early mobilisation have been shown to be effective way of managing most distal femoral fractures. (3) In this study to aim was to study functional outcome of distal femoral fractures & their management.

Materials & Methods:

Twenty five patients having 25 distal femoral fractures with 10 Type A, 7 Type B and 8 Type C fractures of distal femur were treated by open reduction and internal fixation with locking plates, condylar plates and cancellous cannulated screws during the period from August 2008 to March 2010, at Jawaharlal Nehru Hospital and Research Centre Bhilai, C.G. All the 25 patients were available for the study. Fresh & old cases of distal femoral fractures which are closed type and all supracondylar & intercondylar extension of distal femoral fractures were included.

Most of the patients were brought to casualty. A careful history was elicited from the patient and/or attenders to reveal the mechanism of injury and the severity of trauma. Clinical assessment of skeletal and soft tissue injuries and general condition was done. The patients who had supracondylar and intercondylar fractures of distal 9 cm of femur were selected for the study.

Vital signs were recorded. Systemic examination was done. Local examination of the fractured limb in majority of the cases revealed lateral rotation of the limb, swelling at the fracture site, tenderness, abnormal mobility, crepitus and shortening from 1 cm to 2 cm. Distal neurovascular status was assessed by palpating dorsalis pedis and posterior tibial artery and asking the patient to dorsiflex and evert the foot.

Out of 25 patients all were fresh fractures, and they presented to hospital within 0 to 4 days of trauma. X-ray of lower half of thigh including knee joint AP and lateral views were taken. Muller's classification was used. There were 5 type A1, 1 type A2, 4 type A3, 3 type B1, 1 type B2, 3 type B3, 1 type C1, 4 type C2 and 3 type C3. The injured limb of all the patients were immobilised by skin traction and injectable analgesics were given to relieve pain.

Results:

This series consists of 25 cases of distal femoral fractures with 10 Type A, 7 Type B and 8 Type C fractures of the femur treated surgically by internal fixation with a locking compression plate, simple condylar plates and cancellous cannulated screws between March 2008 to August 2010. All these patients were available for follow up.

Table 1: Demographic characteristics of the study subjects.

Variables		Frequency	Percentage
Age group in years	16 - 30 yrs	6	24.0%
	31 - 40 yrs	2	8.0%
	41 - 50 yrs	7	28.0%
	51 - 60 yrs	2	8.0%
	61 - 70 yrs	4	16.0%
	More than 70 yrs	4	16.0%
Gender	Male	19	76.0%
	Female	6	24.0%
Mode of Injury	RTA	16	64.0%
	Fall from Height	2	8.0%
	Simple Fall	6	24.0%
	Rail Track accident	1	4.0%
Side affected	Left	11	44.0%
	Right	14	56.0%
Total		25	100.0%

In the above table no 1 was found there were 19 men and 6 women with an average age of 47.08 years, ranging from 16 years to 78 years. Majority of the patients were belonging to the geriatric age group. The mode of injury was traffic accident in 16 patients; fall in 8 patients, with fall from height in 2 patient and simple fall in 6 patients. In 1 patient mode of injury was Rail track accident. Left femur was involved in 11 (44%) patients and right was involved in 14 (56%) patients.

There were 9 of the 25 patients (36%) had associated injuries. 4 patients had ipsilateral patella fracture. Out of these 4 one had bilateral patella fracture and one had ipsilateral tibial condyle fracture. 3 patients had ipsilateral tibial shaft fracture of which one had ipsilateral femur shaft fracture. One patients had ipsilateral medial malleolar fracture. One patient had fracture lower end radius of contralateral side (Table No. 2)

Table 2: Associated injuries of the study subjects.

Associated Injuries	No. Of Pateitns	
Ipsilateral patella fracture	4	
	Bilateral patella fracture	1
	Ipsilateral tibial condyle fracture	1
Ipsilaterla tibial shaft fracture	3	
	Ipsilateral femur shaft fracture	1
Ipsilateral medial mallolar fracture	1	
Contralateral radius fracture	1	
Total	9	

The fractures were classified according to Muller's classification for distal femoral fractures. There were 5-A1, 1-A2, 4-A3, 3- B1, 1- B2, 4- B3, 1-C1, 4-C2 and 3-C3 fractures. Overall results were excellent in 17 (68%) patients, good in 1 (4%) patients, moderate in 3(12%) patients and poor in 4 (16%) patients. (Table No. 3)

Table 3: Muller Classification for Distal Femoral Fractures in the study subjects.

Muller Classification	Excellent	Good	Moderate	Poor	Total
A1	3	0	0	2	5
A2	0	0	1	0	1
A3	3	1	0	0	4
B1	2	0	1	0	3
B2	1	0	0	0	1
B3	3	0	0	0	3
C1	1	0	0	0	1
C2	3	0	1	0	4
C3	1	0	0	2	3
Total	17	1	3	4	25

Discussion:

25 cases of distal femoral fractures with 10 Type A , 7 Type B, 8 Type C fractures of the femur were treated by open reduction and internal fixation using different types of implants. They were followed up for an average of 14.3 months. The purpose of the study was to evaluate the end result of treatment in these patients and to compare with other studies on the same fracture type.

The average age of all cases in this series was 47.08 years. Fracture was more common in age groups between 41-50 years. Our studies average age is similar to study done by Siliski JM (4) and Rademakers MV (5). But average is lesser than the other studies, this probably is because of increasing number of youngsters getting this injury because of road traffic accidents.

There were 19 male and 6 female patients, showing male preponderance. Shewring DJ and Meggitt BF (6) reported female preponderance in their series. Giles JB et al (7), Pritchett JW (8) and Siliski JM (4), reported male preponderance.

Out of these 9 patients (36%) had associated injuries, denoting that the injury was due to high energy trauma. Many other authors have reported associated injuries to the popliteal artery and ligaments of the knee joint. However, in this series there were no vascular and ligamentous injuries.

In our study excellent result was seen in 68% and good results were seen in 4%. Excellent to good results in this series is similar to that in the series of Pritchett JW (8) and Kolb K (9). Two poor results in C3 type were due to complex fracture pattern and in two A1 type were due to infection in one patient and ipsilateral shaft of femur and tibia fracture in other one.

Conclusion:

Analysis of our results showed that, locking compression plate is a good method of treating closed Type C and Type A fractures in both young and geriatric age group of patients. Spoon plates can be used in type A fractures with good bone stocks. Cancellous cannulated screw fixation with minimal soft tissue dissection is a good method for treatment of close Type B fractures. Minimally invasive surgeries with good implant purchase helps in early mobilisation of the knee joint and stiffness can be prevented.

We conclude that minimally invasive surgical techniques and with the availability of locking type of plates distal femoral fractures can now be dealt with more precessions and more satisfactory results can be produced.

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