



Assessment of Efficacy of Supra-Intercondylar and Supracondylar Femur Fractures Treated with Condylar Buttress Plates: A Comparative Study

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Abstract

Background: *Supra condylar femur fractures occur usually amongst two populations, young subjects that involve in high-energy accidents like motor vehicle and motorcycle accidents and sports trauma and older individuals, those are osteoporotic, after a low-energy fall fractures. With evolution orthopedic surgery, trends in management of supracondylar and inter-condylar femur fractures are now more varied involving different surgical techniques. The present study was conducted with the aim to assess the efficacy of Supra-Intercondylar and Supracondylar Femur Fractures Treated with Condylar Buttress Plates.*

Materials and Methods: *The study was conducted in the department of orthopedics for a period of 2 years. During this period 90 patients reported with femur fractures, out of which 60 were treated by open reduction. CBP was used after reduction of fracture. If additional support was required then supplementary screw fixation was used. Active exercises were started immediately after surgery and ambulation was initiated with crutches. Postoperative radiographs were taken at every follow up visit. The functional outcome was assessed using the score given by Mize. Student t test was used for the analysis of data. The probability value of less than 0.05 was regarded as significant.*

Results: *The study enrolled 60 subjects out of which 30 were having supra intercondylar fractures and 30 had supracondylar fractures. The rate of union was 93.3% (n=28) in supra intercondylar fractures and 96.7% (n=29) in supracondylar fractures. There was no significant difference between the two groups. The average knee score in Group I was 73.4 and in Group II was 86.2. There was a significant difference between the two groups*

Conclusion: *From the present study we can conclude that functional outcome of supracondylar fractures was better with condylar plates as compared to supra intercondylar fractures*

Keywords: *ambulation, intercondylar, supracondylar.*

Introduction

Distal femur fractures apparently account for not as much of 1% of all the fractures and include between 4%–6% of all femur fractures. Supra condylar femur fractures occur usually amongst two populations, young subjects that involve in high-energy accidents like motor vehicle and motorcycle accidents and sports trauma and older

individuals, those are osteoporotic, after a low-energy fall fractures.¹ Intra-articular fractures of distal femur account for an enormous surgical challenge. These fractures are difficult to manage and surgical management is usually suggested for a favorable outcome as these are often comminuted and intra-articular.² With evolution orthopedic surgery, trends in management of

supra-condylar and inter-condylar femur fractures are now more varied involving different surgical techniques. The goal of surgical management is the anatomical reconstruction of the articular surfaces, reduction of metaphyseal part of the fracture to diaphysis, renovation of normal axial alignment, stable internal fixation, rapid and early mobilization and functional rehabilitation of the limb.³ Management of distal femoral fractures remains a clinical challenge. With advancement in the operative techniques, ORIF is the standard treatment protocol followed by many surgeons. A study conducted by Stewart and colleagues amongst 213 subjects of femur fractures in the year 1960 found that Kirschner pin traction was recommended standard treatment with better results compared to ORIF.⁴ Study by Neer and colleagues also showed similar results.⁵ The present study was conducted with the aim to assess the efficacy of Supra-Intercondylar and Supracondylar Femur Fractures Treated with Condylar Buttress Plates.

Materials and Methods

The study was conducted in Department of Orthopaedics, Government Medical College, Pali, Rajasthan, India. for a period of 2 years. During this period 90 patients reported with femur fractures, out of which 60 were treated by open reduction. The study was approved by the institute's ethical board and all the subjects were informed about the study and a written consent was obtained from all in their vernacular language. Subjects more than 18 years of age were included in the study. Subjects who failed to report during the follow up period were excluded from the study. Amongst these there were 30 subjects of supra intercondylar fractures that were included in Group I and 30 subjects of supra condylar fractures that were included in Group II. Traditional lateral approach was used for performing surgeries. CBP was used after reduction of fracture. If additional support was required then supplementary screw fixation was

used. Active exercises were used were started immediately after surgery and ambulation was initiated with crutches. Postoperative radiographs were taken at every follow up visit. Fracture union and bony position were assessed radiographically by using anteroposterior and lateral plain radiographs of the injured leg. Lateral distal femoral angle was used to assess the alignment on radiographs. Its normal value is 79 to 83 degrees. The functional outcome was assessed using the score given by Mize. Any complications occurring during the procedure were also noted. All the data was arranged in the tabulated form and analyzed using SPSS software. Student t test was used for the analysis of data. The probability value of less than 0.05 was regarded as significant.

Results

The study enrolled 60 subjects out of which 30 were having supra intercondylar fractures and 30 had supracondylar fractures.

Table 1 shows the clinical results of the study. The rate of union was 93.3% (n=28) in supra intercondylar fractures and 96.7% (n=29) in supracondylar fractures. There was no significant difference between the two groups. The mean time of union was 6.5 months in Group I and 5.2 months in Group II. There were fewer complications in Group II, only 2 subjects had infection and stiffness respectively. There were 2 cases of infection, 4 cases of stiffness and 5 cases of varus deformity in Group I. There was a significant difference in the complication rate between both the groups.

Table 2 shows the functional outcome of the study. The average knee score in Group I was 73.4 and in Group II was 86.2. There was a significant difference between the two groups. The average function score in group I was 62.3 and in Group II was 84.1. There was a significant difference between the groups. There was no significant difference in the modified mize score between the groups.

Table 1: Clinical results of the study

VARIABLE	SUPRAINTECONDYLAR	SUPRACONDYLAR	P VALUE
Rate of union	28(93.3%)	29(96.7%)	>0.05
Mean time to union (months)	6.5	5.2	>0.05
Complications			
Infection	2(6.7%)	1(3.3%)	>0.05
Stiffness	4(13.3%)	1(3.3%)	>0.05
Varus deformity	5(16.7%)	0	<0.05

Table 2: Functional outcome of the study

VARIABLE	SUPRAINTECONDYLAR	SUPRACONDYLAR	P VALUE
Knee Score	73.4	86.2	<0.05
Function score	62.3	84.1	<0.05
Modified Mize score			>0.05
Excellent	3(10%)	9(30%)	
Good	12(40%)	15(50%)	
Fair	7(23.3%)	5(16.7%)	
Poor	7(23.3%)	1(3.3%)	

Discussion

Distal femur account for 6 % of all femoral fractures and are clinically interesting. Adequate mechanical stability is required for the management of distal femoral fractures; thus, subjects should take early rehabilitation to attain better clinical results. According to study by Schatzker and colleagues⁶ they reported good or excellent results amongst 73.5–75 % patients after open reduction and internal fixation. They highlighted the status of early mobilization and stable fixation. Since the 1970s, open reduction and internal fixation has gained abundant popularity. Various varieties of internal fixations have been used to obtain anatomic reduction and rigid fixation. The favored method of treatment is plate system, that includes condylar buttress plates, dynamic screws, fix-angle plates, and locking plates.⁶⁻¹² However, the thought of concern is that the implant may be stiff, and when related with premature weight bearing by the subject, results may lead to failure of the implant. Distal femoral locking compression plate is another fixation implant that has a smaller device size and allows both locking and compression screw fixation. According to our study, the rate of union was 93.3% (n=28) in supra inter condylar fractures and 96.7% (n=29) in supracondylar fractures. There was no significant difference between the two groups. The mean time of union

was 6.5 months in Group I and 5.2 months in Group II. There were fewer complication sin Group II, only 2 subjects had infection and stiffness respectively. There were 2 cases of infection, 4 cases of stiffness and 5 cases of varus deformity in Group I. There was a significant difference in the complication rate between both the groups. As per the study conducted by Davidson and colleagues varus collapse of comminuted distal femoral fracture was reported after treatment with a CBP.¹³ As per this study, the average knee score in Group I was 73.4 and in Group II was 86.2. There was a significant difference between the two groups. The average function score in group I was 62.3 and in Group II was 84.1. There was a significant difference between the groups. There was no significant difference in the modified mize score between the groups. Few studies suggested that retrograde nailing lead to higher union rate than that attained with plating.¹⁴⁻¹⁶ Plating techniques offers the advantage of attaining anatomic reduction with a direct view of the fracture site. According to study by Rademakers and colleagues amongst 67 patients of distal femoral fracture managed with a fixed-angle condylar plate, there was only 1 patient with nonunion at postoperative 1-year.¹⁷ The sample size of the present study was small to infer to any conclusive decision.

Conclusion

From the present study we can conclude that functional outcome of supracondylar fractures was better with condylar plates as compared to supra intercondylar fractures. On the contrary the clinical results of both types of fractures were similar.

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