

Outcomes of Dynamic Condylar Screw for the Treatment of Supracondylar Fractures of Distal Femur

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ABSTRACT

Aim: To examine the findings of dynamic condylar screw fixation for the treatment of supracondylar fracture of distal femur.

Study design: Prospective study

Place & duration: Dept of Orthopaedic Surgery, Bolan Medical College, Quetta from 01-07-2018 to 31-12-2018.

Methods: In this study total 38 patients of both genders who were radiographically diagnosed to have supracondylar fracture of distal femur were included. Patient's ages were ranging from 20 to 65 years. All the confirmed cases were treated by dynamic condylar screw technique. All fractures were closed and none was pathological. All were operated under General/Spinal anesthesia and dynamic condylar screw was put as per standard protocol. Follow up was taken at one year after surgical treatment.

Results: There were 29 (76.32%) male patients male while rest 23.68% patients were females. Fifteen (39.47%) patients were ages between 20 to 40 years, 18 (47.37%) patients had ages 41 to 60 years and 5 (13.16%) patients were ages > 60 years. The mean operative time was 75±6.10 minutes. Mean hospital stay was 7.50±2.50 days. There were 3 non-unions, 4 infections and 2 had implant failures. Final outcome was recorded using the Neer criteria and the overall union was 94% and the motion range at 1 year was 10-130°.

Conclusion: Dynamic condylar screw was good treatment technique for supracondylar fractures with lesser complication and less hospital stay. It is also concluded that this technique had better results with respect to union of bone and range of motion of knee.

Keywords: Supracondylar fracture, Dynamic condylar screw, Outcome, Union of bone

INTRODUCTION

Distal femur fractures (DFF) occurs at approximately one tenth the rate of proximal femur fractures and make up 6% of all femur fractures. Distal femur fractures have a bimodal distribution, a high energy DFF occur in males between 15 and 50 years while most low energy fractures occurs in osteoporotic women above 50 years¹. Road traffic accident is the most common cause of high energy supracondylar fractures of femur. The treatment of DFF remains a significant surgical challenge². These include osteoporotic bone, open fractures with significant bone loss and fractures with short articular segment³. Non operative treatment methods, such as traction, and cast bracing produced better results than operative treatment because of the lack of adequate, internal fixation devices till 1960. With development of improved internal fixation devices, the trend changed towards surgical treatment of supracondylar fracture of femur in 1980s⁴⁻⁸.

Multiple options exist for the definitive treatment of DFF and include external fixation, intramedullary nailing and plate osteosynthesis with either open reduction or internal fixation or minimally invasive plate osteosynthesis likewise multiple different plating options are available and include conventional buttress plate, fixed angle devices and locking plates. The goals of operative treatment are anatomical alignment, stable fixation, rapid mobilization and early functional rehabilitation of the knee⁹⁻¹¹.

Dynamic condylar Screw (DCS) is a better implant to achieve these goals, as this shares many of the features of a compression hip screw making it familiar to most surgeons. Other advantages include its ability to apply interfragmentary compression across the femoral condyles, better purchase in osteoporotic bone and the need for only two plane alignments. The major disadvantage of DCS is bulky size of the implant at the screw plate junction that requires removal of a considerable amount of bone from the lateral femoral condyle¹². Other method of fixation like retrograde intramedullary Supracondylar Nail (RIMSN), Locking Plates, Less Invasive Stabilization System (LISS) are becoming popular lately because of biological osteosynthesis, preserving blood supply and decreases need for bone grafting. The main objective of this study was to examine the outcome of dynamic condylar screw treatment technique in supracondylar fracture of distal femur.

MATERIALS AND METHODS

This prospective/observational study was conducted at Department of Orthopaedic Surgery, Bolan Medical College, Quetta from 1st July, 2018 to 31st December, 2018. A total 38 patients of both genders whom were radiographically diagnosed to have supracondylar fracture of distal femur were included. Patient's ages were ranging from 20 to 65 years. Patients detailed medical history including age, sex, and causes of fractures were examined after taking informed consent from all the patients. All the

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confirmed cases were treated by dynamic condylar screw technique. Children and those below 20 years were excluded from the study. All fractures were closed and none was pathological. All were operated under General/Spinal anesthesia and dynamic condylar screw was put as per standard protocol. Follow-up was taken at 1 year after surgical treatment. All the statistical data was analyzed by SPSS 19. P-value <0.05 was considered as significant.

RESULTS

Out of 38 patients, 29 (76.32%) patients were male while rest 23.68% patients were females. Fifteen (39.47%) patients were aged between 20 to 40 years, 18 (47.37%) patients had ages 41 to 60 years and 5 (13.16%) patients were ages >60 years. Twenty one (55.26%) cases had right side fracture while 17 (44.74%) had left side (Table 1).

Causes of fracture were noted as road traffic accidents, fall from height and others in 28 (73.68%), 6 (15.79%) and 4 (10.53%) patients respectively (Table 2). The mean operative time was 75±6.10 minutes. Mean hospital stay was 7.50±2.50 days. There were 3 non-unions, 4 infections and 2 had implant failure. Final outcome was recorded using the Neer Criteria and the overall union was 94.74% and the motion range at 1 year was 10 to 130 degree (Tables 3-5).

Table 1: Demographic information of the patients

Variable	No.	%
Sex		
Male	29	76.32
Female	9	23.68
Age (years)		
20 - 40	15	39.47
41 - 60	18	47.37
> 60	5	13.16
Effectuated side		
Right	21	55.26
Left	17	44.74

Table 2: Causes of fractures

Causes	No.	%
Road accidents	28	73.68
Fall from height	6	15.79
Others	4	10.53

Table 3: Complications found in all cases

Complications	No.	%
Non-Union	3	7.89
Infections	4	10.53
Implant Failure	2	5.26

Table 4: Final outcome according to Neer's criteria

Outcome	No.	%
Excellent	23	60.53
Good	8	21.05
Fair	5	13.16
Poor	3	7.89

Table 5: Overall findings according to union and range of motion

Variable	Findings
Union of Bone	94.74%
Motion range in degree	10 to 130

DISCUSION

The management of distal femoral fracture can be non-operative and operative.¹³ Non operative management provides satisfactory results in only 56% of patients while operative management provides satisfactory results in 70–80% of patients.¹⁴In our study the male patient's population was high as compared to females 76.32% and 23.68%. These results show similarity with multiple previous studies in which male patients were high in number 70 to 85% as compared to females¹⁵⁻¹⁷.

In this study, we found that patients with ages 35 to 60 years were most common. A study conducted by Sandeepetal¹⁸ regarding fracture of distal femur reported that 78% of patients were ages 21 to 60 years. In our study we found road traffic accidents was the most common cause of fracture 73.68% and fall from height was 15.79%. Most of the road traffic accidents were due to not following the safety rules. Many of studies regarding supracondylar fracture of distal femur reported road traffic accidents was the most common cause of fracture 55 to 75%^{19,20}. In this study Mean hospital stay was 7.50±2.50 days. There were 3 non-unions, 4 infections and 2 had implant failure. These results shows similarity to other study in which the mean hospital stay was 10 days²¹.

In this study the final outcome observed after 1 year of surgery according to the Neer's criteria was excellent, good, fair and poor as 60.53%, 21.05%, 13.16% and 7.89% respectively and the overall outcome according to union of bone was 94.74% and motion range was 10-130°. These results shows similarity to some other studies in which the overall union of bone after surgery of distal femur fractures was 85 to 95% and the motion range reported 105 to 130 after union of bone^{22,23}.

This study examined the outcome of dynamic condylar screw for the treatment of distal femur fractures and we obtained satisfactory results regarding union of bone. This study will be helpful for providing the better treatment.

CONCLUSION

Supracondylar fractures are one of the most common injuries found in orthopedics departments of health care centers. In this study, we concluded that Dynamic condylar screw was good treatment technique for supracondylar fractures with lesser complication and less hospital stay. It is also concluded that this technique had better results with respect to union of bone and range of motion of knee. We also concluded that road traffic accidents was the major cause of incidence. We should have to aware people to follow the traffic rules to reduce the incidence rate.

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