

# A Study of Dynamic Condylar Screw in the Management of Subtrochanteric Fractures of Femur

Jaisingh Rathod<sup>1</sup>, Kishore Kumar K<sup>2</sup>, Ramkumar Reddy K<sup>3</sup>, Rammohan K<sup>4</sup>, Kiran Kumar B<sup>5</sup>

## ABSTRACT

**Introduction:** The subtrochanteric fractures are one of the common fractures that every trauma surgeon come across on daily basis. The most of these fractures are treated either intramedullary device or a side plate. Among side plates, the choice between the implants like DCS and DHS is varied among the different surgeons. We made an analysis of results of Dynamic Condylar Screw with the aim to find out the use of that implant in selective fracture types.

**Material and Methods:** A prospective study during 2014 to 2015 was done in our institute. The study period is 1 year. The patients who opted for surgical treatment only were chosen. They were undergoing surgery under spinal anaesthesia, using fracture table under image intensifier. The position of fracture reduction was checked in anterior posterior and lateral image intensifier views. The post-operative assessment was done at 3 weeks, 6 weeks and 3 months intervals with regard to radiological union and clinical outcomes. Data was analysed and expressed in terms of percentages.

**Result:** the female to male ratio was 1:1.55. The average age among males is 58 years and of females is 54 years. The right side and left side were involved equally (n=28). Most of the patients were injured by fall at home 39.2% (n=11), due to RTA 32.1% (n=9) and 28.5% (n=8) subjects were injured due to self-inflicted road accidents. Limb shortening is most common complication, which is there for 17.85% (n=5) of patients

**Conclusion:** Dynamic Condylar Screw (DCS) provide good fixation for subtrochanteric fractures with better results in terms of stability and fracture union. Procedure has a fewer complication rates if cases were selected carefully.

**Keywords:** fracture, subtrochanteric, fixation, Dynamic Condylar Screw

also said to have difficulty of procedure which need a long learning curve. There were many discussions which claim equal or near equal outcome results with side plate devices like 95° angle blade plate, dynamic condylar screw plate.<sup>4</sup> The learning curve for dynamic condylar screw plate is less when compared to intramedullary devices is taken in to consideration to study the role of dynamic condylar screw here in studying the subtrochanteric fractures.

## MATERIAL AND METHODS

This prospective study was conducted in MGM Hospital attached to Kakatiya Medical college, Warangal during June 2014 to June 2015. During this one year the patients attending to the casualty were assessed for mode of injury, fracture type, co-morbidities and included for study. The very sick medically unfit patients, patients not willing for surgery were excluded for study.

On inclusion, they were admitted and initially treated with skin traction, analgesics. They were investigated for fitness for surgery. Patients above 40 years were also invariably assessed for cardiac fitness, irrespective of cardiac symptoms. Once they were medically fit, they were taken for surgery. All the patients were underwent surgery under spinal anaesthesia under c-arm image intensifier and on radiolucent fracture table. A standard lateral approach, fracture is exposed and open reduction was performed, position checked in both anteroposterior and lateral views. Entry point selected so as to pass the guide wire into neck and head with the aim to position it, central in neck and inferior in head in anteroposterior view and central through out in lateral view. triple reaming, tapping was done and measured length lag screw inserted aiming the tip in to the subchondral bone with in 5mm of surface of head. Keeping the fracture reduced the

## INTRODUCTION

The fractures around the upper femur are common during the motor vehicle accidents and injuries at home. They are also very common among the all the active age group patients. The subtrochanteric fractures are more so in patients with high energy trauma among young and middle age individuals due to their active life style and need to active participation in society. Whereas the same type of fracture is also common in elder individuals because of their osteoporotic in nature.<sup>1-2</sup> Osteoporosis is one of major contributing factor for comminution at this region and the very reason that this region the place is exposed to high muscle forces. The management of these fractures was been a debate since long time for the right choice of procedure and implant.<sup>3</sup> The proponents of intramedullary implants are with some advantage in terms of implant strength and stability but were

<sup>1</sup>Associate Professor, Department of Orthopaedics, Kakatiya Medical College, Warangal, <sup>2</sup>Associate Professor, Department of Orthopaedics, Kakatiya Medical College, Warangal, <sup>3</sup>Professor, Department of Orthopaedics, Kakatiya Medical College, Warangal, <sup>4</sup>Assistant Professor, Department of Orthopaedics, Kakatiya Medical College, Warangal, <sup>5</sup>Assistant Professor, Department of Orthopaedics, Kakatiya Medical College, Warangal, India

**Corresponding author:** Dr. Kishore Kumar K, Associate Professor, Department of Orthopaedics, Kakatiya Medical College, Warangal, India

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appropriate length, most commonly 4 hole 95' barrel plate was abutted on to lateral surface of upper shaft and trochanter. Precaution taken to centre the plate on to the lateral surface of shaft of femur. The length, axial alignment and rotation of distal fragment were reconfirmed clinically. Plate fixed to shaft with 4.5mm cortical screws, minimum of seven cortices distal to the fracture. Post operatively quadriceps exercises were encouraged immediately. Movements were allowed as tolerated, discharged after 5 days and partial weight bearing was started after two to three weeks, depending on tolerance and fracture pattern. Full weight bearing was allowed only after signs of radiological union, checked at the intervals of 3 weeks, 6 weeks and 12 weeks. The final assessment done at 1 year. The assessment is done by the basis of criteria by Radford et al.<sup>5</sup>

#### Assessment criteria: (Radford)

Excellent	Flexion loss less than 10 degrees No varus, valgus or rotational deformity No pain Perfect joint congruity
Good	Not more than one of the following loss of length not more than 2cm less than 10 degrees varies values flexion loss not more than 20 degrees minimal pain
Fair	Any of the two of good category
Failure	Flexion loss more than 20 degrees Varus / valgus more than 15 degrees Joint incongruity Disabling pain

The complications observed are wound infection, limb length discrepancy, pain on walking, restricted knee movement, restricted hip movement, loosening of implant, deformity, foot drop, implant breakage, pulmonary infections, pressure sores and secondary procedure.

#### STATISTICAL ANALYSIS

The data in relation to mode of injury the frequency of complications were noted for analysis.

#### RESULTS

We have analysed the results of prospective study of 28 patients selected among 34 patients treated during June 2014 and June 2015. The six patients were excluded for not fitting in to the criteria and in the remaining 28 patients 18 were males, 10 patients were females (Table no.1). Almost all of injuries were due trauma, majority are road traffic accidents (39.3%) and fall with trivial trauma (28.6%) (Table-2). The side of injury is almost equally distributed. The complication rate is some what higher (46%) but we observed that the higher incidence is due to multiple parameters taken and two or more parameters coexisted in an individual patient is taken as separate complication, accounted for high complication rate. Among 28 patients, only three patients (10.7%) required a secondary surgery. Implant breakage and pain on walking were the leading complications accounting for 20% of complications.

Side affected	Frequency	Percentage
Right	13	46.4
Left	15	53.6
Total	28	100

Table-1: patient distribution - side affected

Injury	Frequency	Percentage
Fall	8	28.6
Collision	5	17.9
Accident	11	39.3
Others	4	14.3
Total	28	100

Table-2: mechanism of injury

Complication	Frequency	Percentage
wound infection	1	3.5
limb length discrepancy	1	3.5
pain of walking	3	10.7
Restricted knee movement	1	3.5
Restricted hip movement	0	0
Loosening of implant	1	3.5
Deformity	0	0
Foot drop	0	0
Implant breakage	2	7.1
Pulmonary complications	1	3.5
Pressure sores	0	0
Secondary surgery	3	10.7

Table-3: Complications and frequency<sup>6</sup>

Side affected	No. of patients	Percentage
No complication	24	85.7
With complication	4	14.3
Complication requiring surgery	3	10.7

Table-4: Patients - complication afflicted

#### DISCUSSION

The treatment and outcome of subtrochanteric fractures is varied and depends on various factors such as fracture pattern, comunion, fracture extension, osteoporosis, technical expertise, age, co-morbid conditions.<sup>7</sup> Further the subtrochanteric region is manipulated by different muscles trying to displace the upper and lower fragments in different directions. There are many implant options to counter or withstand these forces. In addition to intramedullary devices, side plate devices are also being used commonly. Dynamic hip screw barrel plate is commonly used implant, as it is versatile and forgiving, but is inadequate in terms of preventing shortening and medial displacement of shaft.<sup>8</sup> Dynamic condylar screw fixation is having stronger resistance for above two complications, but it is having its own disadvantages.<sup>9</sup> In this study we studied the complications of commonly used dynamic condylar screw fixation in subtrochanteric fractures. The majority (85.7%) of patients were having good to excellent results and had no complaints or complications. The remaining patients (14.3%)

were had different complications (Table-3). Though it seems the complication rate is high, but in fact the patients have had complications are having more than one complications per patient which lead to seemingly higher number of complications. Among all only 3 patients needed a second surgery, while other patients with complications were minor and does not alter the quality of life and not enough to warrant any further procedure (Table-4).

## CONCLUSION

The dynamic condylar screw for the subtrochanteric fractures yield results which are satisfy to note few things. It is a better implant to chose for a specific set of fractures especially the dynamic hip screw is inadequate in terms of stability which in turn fail because of lateral displacement and axial collapse causing implant failure deformity and shortening. The intramedullary devices like proximal femoral nailing which are advocated for this type of fractures are technically demanding and many failures of proximal femoral nailing are due to technical pitfalls which practically have very high learning curve.

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