

ORIGINAL ARTICLE

OUTCOMES OF DISTAL FEMUR FRACTURE TREATED WITH DYNAMIC CONDYLAR SCREW

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Background: Implants for open reduction and internal fixation of distal femoral fracture includes angle blade plate, rush nails, enders nail and interlocking nails. But all these devices are technically demanding and less effective in providing inter-fragmentary compression in osteoporotic bones. These problems can be solved with dynamic condylar screw (DCS). The objective of the study was to determine the frequency of different outcomes of distal femoral fracture treated with dynamic condylar screw **Methods:** This case series study was carried out in the Department of Trauma & Orthopaedics, Ayub Teaching Hospital Abbottabad from 1st October 2014 to August 2015, after approval of the ethical committee of the institution. Data of all patients with distal femoral fractures aged 20-70 years, recruited through emergency, OPD or consultant clinic collected on a *pro forma*. Standard treatment of trauma was given to the patients. Detailed history was taken including the past medical and surgical history. Detailed examination including air-way, breathing and circulation, general physical examination and abdomino-pelvic examination was done in each patient. Investigations including urinalysis, haemoglobin %, full blood count, X-ray (both AP and lateral view) of the involved femur (including hip and knee) was done. **Results:** Mean age of the patients was 43.18±14.647 ranging from 20 to 70 years. Mean duration of hospital stay in days was 2.21±1.111 ranging from 1 to 6 days. Patients' follow-up assessment after 4 months of surgery for union of femoral fracture treated with dynamic condylar screw was found in 96 (94.1%), wound infection was found in 7 (6.9%), knee stiffness was found in 21 (20.6%) and limb shortening was found in 7 (6.9%). **Conclusion:** Dynamic condylar screw is an easy, scientifically less difficult and satisfying method of treatment for fractures of femur.

Keywords: Distal Femur Fracture, Dynamic Condylar Screw, Internal fixation

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INTRODUCTION

Femur is the strongest and longest bone in the human body.¹ Distal femoral fracture involves the lower 9–15 cm of femur down to articular surface of the knee.² Distal femoral fracture is a common fracture occurring in the human body.³ However it is 10 times less common than proximal femur fracture.⁴ If fractures of the hip are excluded, 31% of the femoral fractures involve the distal portion.⁵ Regarding age distribution of the patients having femoral fracture, men are more affected in their thirties and females in their seventies.⁶ The causes of distal femoral fracture differ in young and old age.⁷ In young age the common causes are high energy trauma like road traffic accidents, sports injuries and firearm injuries. In contrast low velocity injuries like fall while walking leads to distal femoral fracture in elderly patients.^{8–11} In elderly patients, distal femur fractures are second most fragility fractures of the femur following those of the hip joint.¹²

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.⁶

Before 1970 the non-operative management was the treatment of choice for distal femoral fractures because of the lack of availability of implants and new techniques. Problems associated with non-operative management include confinement of the patient to bed, knee stiffness, mal-union and non-union. On the other hand operative management facilitates care of the soft tissue, allow early mobilization and relatively easy nursing care.⁸

Implants for open reduction and internal fixation of distal femoral fracture includes angle blade plate, rush nails, enders nail and interlocking nails. But all these devices are technically demanding and less effective in providing inter-fragmentary compression in osteoporotic bones. These problems can be solved with dynamic condylar screw (DCS).⁸

Advantages of DCS include easy insertion, being more effective in providing inter-fragmentary compression across an inter-condylar fracture, correction of Mal-alignment in sagittal plane, firm fixation, less operative time, shorter duration of hospital stay and increased strength and resistance of stress fractures.^{14,15} Union rate with DCS is 96.2%.¹⁵ Moreover because of its

stable fixation post-operative range of motion exercises can be started on 1st post-operative day.¹⁶

This study was planned to determine the outcome of treating distal femoral fractures with dynamic compression screw in our setting as no work has been done in this regard previously in our hospital and data regarding the outcomes is scarce.

MATERIAL AND METHODS

The descriptive case series was conducted in department of Orthopaedics, Ayub Teaching Hospital; Abbottabad from 1st October 2014 to August 2015. All the patients reporting in the study period with distal femoral fracture in age group 20 - 70 years of both genders were included. Patients with Pathological fractures, open fractures, diaphysial fracture and patient less than 20 years and more than 70 years of age were not included.

The study was conducted after approval of the ethical committee of the institution. Fully informed, understood and voluntary consent was obtained. Patients were informed regarding the benefits and hazards of the procedure. Confidentiality of the data was ensured.

Data of all patients with distal femoral fractures aged 20–70 years, recruited through emergency, OPD or consultant clinic was recorded on a *pro forma*. Standard treatment of trauma was given to the patients. Detailed information was taken including the past medical and surgical history. Detailed examination including air-way, breathing and circulation, general physical examination and abdomino-pelvic examination was done in each patient. Investigations including urinalysis, haemoglobin%, full blood count, X-ray (both AP and lateral view) of the involved femur (including hip and knee) was done.

After administration of general or spinal anaesthesia patient was put in supine position, cleaning and draping of the involved limb was done. Fracture was exposed/ approached through lateral incision and reduced and fixed with DCS. After surgery, the patient was shifted to the ward and kept there for 1–2 days with administration of IV antibiotics. Post-operative X-rays (both AP and lateral views) were taken and the patient advised to do a range of motion exercises for the knee and hip joint. During follow-up, clinical and radiological assessment was done. The first follow-up visit was after two weeks and subsequent visits were conducted on a monthly basis till six months after surgery.

RESULTS

A total of 102 patients were included in the study to determine the frequency of different outcomes of

distal femoral fracture treated with dynamic condylar screw.

Mean age of the patients was 43.18±14.647 ranging from 20 to 70 years. Mean duration of hospital stay in days was 2.21±1.111 ranging from 1 to 6 days.

Patients who had left side femoral fractures were 38 (37.3%) and patient with right side involved were 64 (62.7%) and 50 (49.0%) were male and 52 (51.0%) were female. Patients' follow-up assessment after 4 months of surgery for union of femoral fracture showed that union was found in 96 (94.1%) while non-union was found in 6 (5.9%).

Patients' follow-up assessment after surgery for wound infection showed that infection was found in 7 (6.9%) while no infection was found in 95 (93.1%) of the patients. knee stiffness was found in 21 (20.6%) while with no knee stiffness was found in 81 (79.4%) of the patients. Patients' follow-up assessment after surgery for limb shortening showed that limb shortening was present in 7 (6.9%) of the patients.

DISCUSSION

The study was conducted at Orthopaedic Unit of Ayub Teaching Hospital Abbottabad, a total of 102 patients were included to determine the frequency of different outcomes of distal femoral fracture treated with dynamic condylar screw.

In this study the mean age of the patients was 43.18±14.647 ranging from 20 to 70 years. Mean duration of hospital stay in days was 2.21±1.111 ranging from 1 to 6 days and Patients who had left side femoral fracture were 38 (37.3%) and patient with right side involved were 64 (62.7%).

In our study 50 (49.0%) were male and 52 (51.0%) were female. While the study conducted at Khyber teaching hospital the ratio was 75% and 25%.¹⁷

In this study the patients' follow-up assessment after 4 months of surgery for union of femoral fracture treated with DCS was found in 96 (94.1%) while non-union was found in 6 (5.9%). Similar results were found in a study conducted by Kao *et al.*¹⁵

In this study the patients' follow-up assessment after surgery for wound infection was found in 7 (6.9%) while no infection was found in 95 (93.1%). while high rate was found in study conducted by Penugonda Ravi Shankar¹⁸ and patients' follow-up assessment after surgery for knee stiffness was found in 21 (20.6%) while with no knee stiffness was found in 81 (79.4%). Lower levels of knee stiffness were also observed in study conducted in India.⁵

Patients' follow-up assessment after surgery for limb shortening was found in 7 (6.9%) while with no limb shortening was found in 95 (93.1%). The results of our study with regard to limb shortening was almost

near as a study conducted by Ali at Leady Reading Hospital Peshawar.¹⁴ but higher levels were observed in study conducted by Penugonda Ravi Shankar.¹⁸

CONCLUSION

It is concluded in our study that the dynamic condylar screw is an easy, scientifically less difficult and satisfying method of treatment for fractures of femur.

AUTHOR'S CONTRIBUTION

AA: Compiling of data, data analysis. SA, A and SA: data collection. MNUR and TM and SS: Supervision

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