

Functional Outcome of Type C3 Distal Femur Fracture Following Open Reduction Internal Fixation with Locking Compression Plate

Jignesh Thacker*, A Sakthivel and Alphonse Mariadoss

ISHKS Fellow in Joint Replacement, Department of Orthopaedics, Newlife Hospital, Gandhidham, Kutch, Gujarat, India

***Corresponding Author:** Jignesh Thacker, ISHKS Fellow in Joint Replacement, Department of Orthopaedics, Newlife Hospital, Gandhidham, Kutch, Gujarat, India.

Received: February 11, 2021

Published: March 10, 2021

© All rights are reserved by **Jignesh Thacker, et al.**

Abstract

Introduction: Distal femoral fractures (type 3c) are difficult to treat and achieve excellent functional outcome due to various factors like involvement of articular surface and comminution.

Procedure: Standard trauma protocol followed and patient was regularly followed up for radiological union and assess functional outcome, Neer's scoring was used to analyse the functional outcome. This patient has excellent outcome at 4 month with full extension, knee rom of 100 degrees. Average time for union was 11 weeks.

Discussion: In a study by Schandelmaier, *et al*: 54 Patients treated by LCP 78% had good results, Higgins, *et al*: LCP to be a stronger construct, Kregor, *et al*: 104 patients treated by LCP 71% had good results, Siliski in 1989 evaluated 52 intercondylar femoral fractures (AO type C):77% had good results.

Conclusion: Treatment of type III C distal femoral fractures is a technically complex procedure and favorable outcome associated with LCP.

Keywords: Type C3 Distal Femur Fracture; Open Reduction Internal Fixation; Locking Compression Plate

Introduction

Distal femoral fractures (type 3c) are difficult to treat and achieve excellent functional outcome due to various factors like involvement of articular surface and comminution.

There are different methods available with which these fractures can be treated, we are presenting case report of functional outcome of type C3 distal femur fracture following open reduction internal fixation with locking compression plate.

Case Description

A 54 year old patient admitted to our hospital with distal femur fractures, history regarding mode of injury, physical examination,

x-ray knee joint and CT scan was done. Patient was posted for surgery. AO classification was used to assess the fracture type.

Procedure

The patient is placed on a table with bolster under the knee. Through lobenhoff's approach the fracture was exposed and patient has medial and lateral Hoffa's fracture which was reduced and fix provisionally with k-wire and then with 6.5 mm cc screws, then intercondylar fracture fixed with k wire and 6.5 mm cc screw, finally supracondylar fragment was reduced and fixed with locking compression plate. Whole procedure monitored with c-arm, routine rehabilitation protocol followed post operatively and patient was fol-

lowed up at regular interval, Neer's scoring was used to analyse the functional outcome. This patient has excellent outcome at 4 month with full extension, knee rom of 100 degrees, no shortening and full weight bearing. Average time for union was 11 weeks.

Figure : Radiograph of right knee preoperatively AP and lateral view, CT scan of right knee preoperatively, post-operative AP and lateral view of knee joint, flexion 100° and full extension 4 months postoperative.

Discussion

The aim of this case report is to assess the results of fracture of distal femur managed by locking compression Plate.

The LCP is single beam construct where the strength of its fixation is equal to the sum of all screw-bone interfaces rather than a single screw's axial stiffness and pullout resistance in unlocked plates. Its unique biomechanical function is based on splinting rather than compression resulting in flexible stabilization, avoidance of stress shielding and induction of callus formation. The locking screw-plate construct proved stronger than the condylar plate in both cyclic loading and ultimate strength in biomechanical testing of a simulated A3 distal femur fracture. Although differences

were small, the biomechanical performance of the locking plate construct over the condylar plate may lend credence to use of the locking plate versus the condylar plate in the fixation of comminuted distal femur fractures.

In a study by Schandelmaier, *et al.* 54 patient were treated with locking compression plate for distal fractures. Of 54 fractures, 6 patients had bone grafting and range of Movements are 104°. Most of the distal fractures were type C fractures and 78% of patients had good functional results by Neer knee score. 13 of the patients had malalignment [13].

Higgins, *et al.* in their study comparing strength of fixed angle blade plate to that of locking condylar buttress plate and mentioned the later to be significantly stronger construct.

Condylar buttress plate is essentially a broad DCP with a clover-leaf shaped distal part. The problem with condylar buttress plate is that the screws passing through the distal holes do not have a fixed relationship to the plate. The screws may shift relative to the plate producing varus deformity or valgus deformity [9].

Siliski in 1989 evaluated 52 intercondylar femoral fractures (AO type C) treated with 95° Condylar blade plate, Condylar Buttress Plates, T-plates and straight plates. Cancellous bone graft was used. Average time of healing was 13.6 weeks. Seven fractures healed in 4° to 8° of varus-valgus malalignment and three fractures healed in 5° to 10° of recurvatum. Shortening of 1 to 3 cms occurred in 15 patients. The average eventual arc of motion of the knee was 107 degrees, with an average knee motion being 113° for C1 fractures and 99° for C3 fractures. Overall C1 fractures resulted in good or excellent outcome in 92% of cases, whereas C2 and C3 fractures resulted in 77% excellent or good result [3].

We followed the rating system of NEER for functional evaluation which gives equal importance to objective (pain, disability) clinical (shortening, knee flexion) and radiological (angulation) marker [1,2,4-8,10-12].

Conclusion

Treatment of type III C distal femoral fractures is a complex procedure which needs proper planning and execution in operating room. The availability of locking compression plate has helped to achieve consistently good results with better range of motion and

function of knee. Because of the good results obtained by using the locking compression plate, in the treatment of distal femoral fractures, it should be the implant of choice.

Bibliography

1. Schatzker J and Lambert DC. "Supracondylar Fractures of the Femur". *Clinical Orthopaedics* 138 (1979): 77-83.
2. Laros GS. "Supracondylar fractures of the femur: Editorial comment and comparative results". *Clinical Orthopaedics and Related Research* 138 (1979): 9.
3. John M Siliski, *et al.* "Supracondylar intercondylar fractures of femur; treatment by internal fixation". *J.B.J.S.* 71-A (1989).
4. Fracture and dislocation compendium. Orthopaedic Trauma Association Committee for Coding and Classification". *Journal of Orthopaedic Trauma* 10.1 (1996): 1-154.
5. Stover M. "Distal femoral fractures: current treatment, results and problems". *Injury* 32.3 (2001): SC3-SC13.
6. Kregor PJ. "Distal Femur Fractures with Complex Articular Involvement". *Orthopedic Clinics of North America.* 33 (2002). 153-175.
7. Wagner M. "General principles for the clinical use of the LCP". *Injury* 34.2 (2003): 31-42.
8. Egol KA, *et al.* "Biomechanics of Locked Plates and Screws". *Journal of Orthopaedic Trauma* 18 (2004): 488-493.
9. Higgins TF, *et al.* "Biomechanical analysis of distal femur fracture fixation: fixed-angle screw plate construct versus condylar blade plate". *Journal of Orthopaedic Trauma* 21.1 (2007): 43-46.
10. Marek DJ, *et al.* "Operative treatment of acute distal femur fractures: systematic review of 2 comparative studies and 45 case series (1989 to 2005)". *Journal of Orthopaedic Trauma* 20.5 (2006): 366-371.
11. EJ Yeap and AS Deepak. "Distal femoral locking compression plate fixation in distal femoral fractures:early results". *Malaysian Orthopaedic Journal* 1.1 (2007): 12-17.
12. Seinsheimer F. "Fractures of the distal femur". *Clinical Orthopaedics and Related Research* 153 (1980): 169-179.
13. Krettek C, *et al.* "Transarticular joint reconstruction and indirect plate osteosynthesis for distal supracondylar femoral fractures". *Injury* 28 (1997): SA31-SA41.

Assets from publication with us

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

Website: www.actascientific.com/

Submit Article: www.actascientific.com/submission.php

Email us: editor@actascientific.com

Contact us: +91 9182824667