

Results of Locking Compression Plate fixation in Distal Femur Fractures: A Prospective Study

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Abstract:

Background: Distal femoral fractures represents a challenging problem in orthopaedic practice. Open reduction with Internal fixation replaces previous trend of closed conservative management and external fixation. Distal femoral locking compression plate (DF-LCP) requires both locking and compression screw fixation of the femur shaft. This study was conducted to examine the short-term results, early complications and healing rate of distal femoral fractures treated with the DF-LCP.

Materials and Method: 32 patients were included in the study. Lateral approach was performed as standard surgical technique. Functional results evaluated using knee society score.

Results: There were 24 males and 8 female patients of mean age 48.84 years. Road traffic Accident (59.38%) was the commonest mode of injury and 33A3 was the commonest fracture type (25%). Most were closed fractures (78.12%). Late complications seen in 4 cases of implant failure (broken plate and screw breakage) and 2 wound infections. 100% union rate seen with an average union time 14.40 weeks. Knee society score was Excellent in 13 (40.63%), good in 17 (53.12%) and failure in 2 (6.25%) patients.

Conclusion: DF-LCP is an important armamentarium in treatment of Distal femur fractures especially when fracture is closed, severely comminuted and in situations of osteoporosis.

Keywords: Locking compression plate, internal fixation, distal femur fracture

THESIS SUMMARY

Introduction

The incidence of distal femoral fractures is 4-7% of all femur fractures. Distal femoral fractures, especially AO Type C fractures are difficult to treat as diastasis of 3 or more millimetres cause Osteoarthritis. The problems associated with conservative management as was done previously are the limitation of reduction and difficulty of maintaining reduction with associated complications of prolonged immobilisation and economic considerations of increased hospital stay. Pin tract infections and joint contractures are common complications with external fixation with devices such as the hybrid external fixator and the Ilizarov external fixator. Internal fixation devices used earlier such as 95° angled blade plate, dynamic condylar screw plate, condylar buttress plate and retrograde supra-condylar inter-

locking nail etc. but these implants may not be ideal for complex inter-condylar and metaphyseal comminuted fracture types.

Distal femoral locking compression plate (DF-LCP) has a smaller application device and allows both locking and compression screw fixation of the femur shaft. This study was conducted to examine the short term results, early complications and healing rate of distal femoral fractures treated with the distal femoral locking compression plate.

Aim and Objectives

Aim:

To study and analyse the results of Locking compression plate (LCP) in Distal Femur Fracture.

Objectives:

- 1) To Analyse the clinical profile of the patient in regards to age, sex, mode of injury and any other relevant features.
- 2) To evaluate the Radiological union in treated patients.
- 3) To evaluate the complications.
- 4) To evaluate the functional outcome in treated patient based on knee findings.
- 5) To Assess any factors influencing the results.

Materials And Method

This study was performed in Assam Medical College & Hospital, Dibrugarh from July, 2012 to June, 2013 and 32 patients eligible for inclusion were selected who were admitted either through the Outpatient Department (OPD) or the Emergency Department (Casualty). All the fractures were post-traumatic. No pathological fracture was included in the study. Patients with distal neurovascular injury is not included in this study. Inclusion Criteria: were Fresh cases of Closed fractures or Type I open (Gustilo and Anderson) in skeletally mature patients. Exclusion Criteria: were who do not gave consent, unable to take part in post-operative rehabilitation. Open infected wound like Compound fracture (type 2 or 3), Pathological Fractures and Malunited fractures or Long standing cases (>3wks) or patients with Definite major illness like malignancy, chronic major system illness etc. Drug or alcohol abuse were also excluded.

After admission into the hospital general and systemic examination as well as local examination along with thorough assessment of patient to rule out other systemic injuries was done followed by evaluation of patients in terms of age, sex, mode of trauma and period between injury and arrival. Thereafter patient is stabilized with intravenous fluids, oxygen and blood transfusion as and when required. Careful assessment of injured limb as regards to neurovascular status was noted. Primary immobilization done with a Thomas splint and Antero-posterior and true lateral views of injured limb including Hip joint and Knee joint were done. CT scan was done as and when required. Traction given over Thomas splint for complex fractures. Analgesics were administered as required. Preoperative preparation include prophylactic antibiotics (3rd generation cephalosporin) on the evening before surgery and just before skin incision. Either Spinal anaesthesia or General anaesthesia were used. Operating field washed with savlon, povidone iodine and was draped separately. **PROCEDURE:** Lateral approach as standard surgical technique was followed in all patients. The incision should start as proximal as necessary and distally, should extend across the midpoint of the lateral condyle anterior to the fibular collateral ligament, across the knee joint, and then gently curve anteriorly to end distal and lateral to the tibial tubercle. The fascia lata is incised in line with the skin incision. At the knee, the iliotibial tract will need to be incised, and the incision will continue down through the joint capsule and synovium to expose the lateral femoral condyle. The superior geniculate artery will need to be identified and ligated. Care was taken not to incise the lateral meniscus at the lateral joint margin. The vastus lateralis muscle is carefully elevated from the intermuscular septum and is retracted

anteriorly and medially. Fractures were reduced under direct vision using manual traction. A knee roll assisted the procurement and maintenance of reduction. The plate length, axial and rotational alignment were checked under image intensifier (IITV). Temporary fixation was achieved through the use of Kirschner-wires. Intercondylar type fractures were converted to a single condylar block before DF-LCP. Appropriate lengths of the plates were selected intra-operatively. Fixation of plates done. In minimally invasive technique, of selected distal femur fractures, a 5-6cm lateral incision limited to the area of the lateral condyle and distal metaphysis was used. The incision was placed more distal to allow for retrograde sub-muscular plate insertion. Condylar screws are placed through the incision used for plate insertion. Adequate length of LCP was taken and placed on distal femur and temporarily fixed with k-wires. Locking compression screws were applied sequentially, followed by proximal screws. Reduction was viewed under IITV. Wound was washed thoroughly with normal saline. Drain was given to every patient. Closure was done in layers after Haemostasis was achieved, followed by Dressing. Posterior plaster slab above knee was applied.

Considering the patient's condition and the stability of the internal fixation, mobilization using a walker was done as soon as possible with the help of supervised physiotherapy. Crutch walking given but weight bearing was not allowed. In case of unstable fracture immobilization was upto 3 weeks. Weight bearing was allowed only after clinical and functional assessment.

Patients were followed up clinically at 2, 6, 12 and 24 weeks and radiologically at 6, 12 and 24 weeks. Further radiological assessment was done at 6 weeks, 3 months, 6 months and 12 months.

Results

Among 32 patients the mean age was 48.84 years (youngest 18 years and oldest 78 years), 24 males and 8 females were among the subjects. Slight preponderance of Left side was noted. Road traffic Accident (RTA) (59.38%) was the Commonest mode of injury. Five cases had fractures in other parts of the body. One case had Associated head injury with other parts fracture. Most of the patient were closed fracture 25 Patients (78.12%) and 7 patients (21.88%) were open fractures. Majority (87.50%) were operated in 8-14 days following injury. There were no intraoperative and immediate post-operative complications. Late complications encountered were 2 cases of implant failure (broken locking plate and screw breakage) and 2 wound infections. Broken implants were safely removed and treated with other method. The union rate was 100% in the study group with average union rate 14.40 weeks, with no delayed or non-unions in the study, except 2 failure case treated with other implants. The union rate was 100% in our study group with average union time of 14.40 weeks, with no delayed or non-unions in the study, except 2 failure case treated with other implants. Based on the assessment criteria of knee society score for the present study, the final outcome for all cases was Excellent in 13 (40.63%) patients, good in 17 (53.12%) patients and failure in 2 (6.25%).

Conclusion

The final outcome of the study based on the assessment criteria of knee society score was Excellent in 13 (40.63%) patients, good in 17 (53.12%) patients and failure in 2 (6.25 %). Thus, Locking Compression Plate is an important armamentarium in treatment of the Distal femur fractures especially when fracture is closed, severely comminuted and in situations of osteoporosis. Further study in large number of patients is required to comment regarding disadvantages and complications.

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