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Efficacy of proximal femoral locking compression plate in the management of unstable extracapsular proximal femur fractures

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Abstract
Introduction: The proximal femur fractures are devastating injuries that most commonly affect the elderly population. The purpose of this study was to assess the efficacy of proximal femoral locking compression plate in the management of unstable extracapsular proximal femur fractures.
Materials and methods: The proposed study is a hospital based prospective study. It was done between 2012 and 2014. During this period 32 cases of adult patients with unstable proximal femur fractures were selected according to inclusion criteria. The fractures were classified according to AO classification and Seinsheimers classification. 32 cases presenting to orthopaedic emergency and outpatient department were treated and were followed at regular intervals.
Results: At the end of 3 months, 30 (93.75%) had no significant residual pain, 28 (87.5%) could squat, 31 (98.87%) could sit cross legged, 32 (100%) could walk up and down stairs unaided. According to modified Harris hip score results were excellent (40.6%), good (59.6%), fair (00%) and poor (00%). Average time of returning to work was 105.9 days. N = number of cases.

Keywords: Intertrochantric fractures, locking compression plate

Introduction
The proximal femur fractures are devastating injuries that most commonly affect the elderly population. Intertrochanteric fractures are common in the elderly female due to osteoporosis and 90% of fractures result from a simple fall[1]. These fractures can be managed by conservative methods, but malunion and complications of prolonged immobilization is the end result. Thus, surgery by internal fixation is the ideal choice. Dynamic hip screw (DHS) is the gold standard treatment for inter trochanteric fractures[2]. In case of unstable intertrochanteric fractures, the incidence of limb shortening, medialization of distal fragment and implant cutouts is high[1]. This led to the development of newer methods like intramedullary devices and proximal femoral locking compression plate. Proximal femur- locking compression plate (PF-LCP) represents a feasible alternative for the treatment of unstable inter-trochanteric fractures. PF-LCP provides the surgeon with the flexibility to achieve plate to bone apposition as well as axial compression or angular stability.

Aims and Objectives
1. To study the effectiveness and functional outcome using Modified Harris' Hip score for surgical management of Unstable Extracapsular Proximal Femoral fractures in skeletally mature patients using Proximal Femur Locking Compression Plate.
2. To evaluate the complications in the management of Unstable Extracapsular Proximal Femoral fractures using proximal femur locking compression plate in terms of time to union, varus malalignment, fixation failures.

Material and methods
This study was conducted from November 2012 to March 2014. During this period 32 cases of adult patients with unstable proximal femur fractures were selected according to inclusion criteria. The fractures were classified according to AO classification and Seinsheimers classification.

32 cases presenting to Orthopaedic emergency and outpatient department were treated and were followed at regular intervals. This study was conducted with due emphasis for clinical observation and analysis of results after surgical management of complex proximal femur fractures with proximal femoral LCP.

Inclusion Criteria

1. Patients with unstable extracapsular proximal femur fractures AO-OTA type 31A2 and 31A3 extending from basicervical region to 5cm below the lesser trochanter.
2. Fractures less than 3weeks old.
3. Skeletally mature patients.
4. Patients willing for treatment and giving consent for operative management.

Exclusion Criteria

1. Open fractures.
2. Patients with multiple trauma.
3. Fractures more than 3weeks old.
4. Patients with neurovascular injuries.
5. Patients with fractures already treated with other modes of ORIF and failed.
6. Patients unfit for surgery with other comorbidities.
7. Patients lost in follow-up.

Consent from the patients was taken prior to enrollment in the study after explaining the mode of treatment.

Data collection

Patients with complex proximal femur fractures admitted for the study were recorded in a proforma prepared for the study. Following the treatment patients were discharged and followed up at outpatient department at regular intervals for clinical and radiological evaluation. The patients were followed up till fracture union and functional recovery. If necessary, subsequent follow up was done.

Results

Thirty two acute closed unstable fractures of proximal femur were treated with proximal femoral locking compression plate in the department of orthopaedics, Lady Hardinge Medical College and Dr. Ram Manohar Lohia Hospital. These were followed for a minimum of 3 months period.

Average age in our study was 49.6years.

There was an almost equal distribution of cases in all age groups and most of them were males (75%). Most of these fractures were right sided (62.5%).

Most of the cases were result of road traffic accident (43.75%) in the young and self-fall (40.62%) in the elderly.

Most of the fracture types were AO type 31 A2 (56.25%). Comminuted intertrochanteric fracture constituted 25 cases and subtrochanteric fractures in 7 cases.

Average OT time for all patients of all fracture type was found to be 103 min and average blood loss was about 112.5 ml.

Mean duration of hospital stay was 4.5 days.

Mean time for full weight bearing was 12 weeks and 90.6% of cases showed bony union at 3months follow-up.

Average union time in my series was 98 days (range 80-130 days)

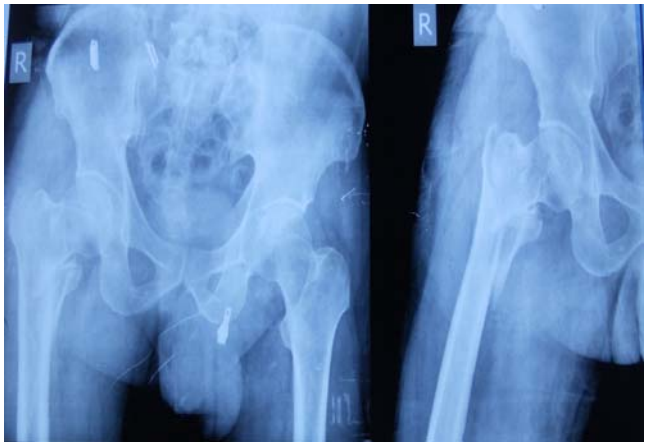
There were seven cases of angular malunion which included 6 cases of minor valgus deformity and 1 case of varus collapse (21%), seven shortening which were not significant 21%), three superficial infection (9.3%) and two implant failure in the form of screw breakage (6%) and no cases of iatrogenic fractures.

At the end of 3 months, 30 (93.75%) had no significant residual pain, 28 (87.5%) could squat, 31 (98.87%) could sit cross legged, 32 (100%) could walk up and down stairs unaided.

According to modified Harris hip score results were excellent (40.6%), good (59.6%), fair (00%) and poor (00%).

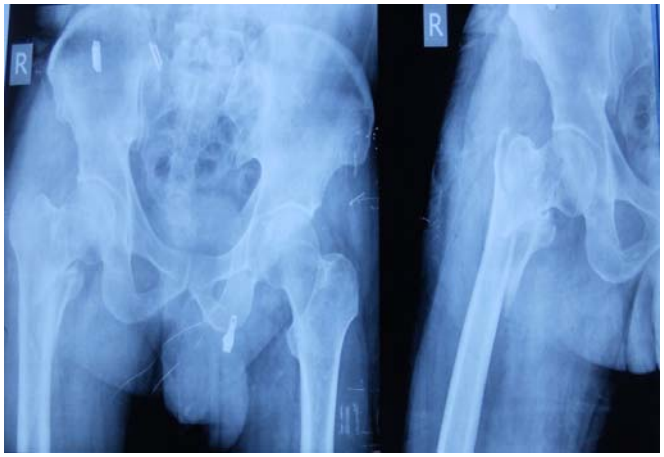
Average time of returning to work was 105.9 days.

Case 2

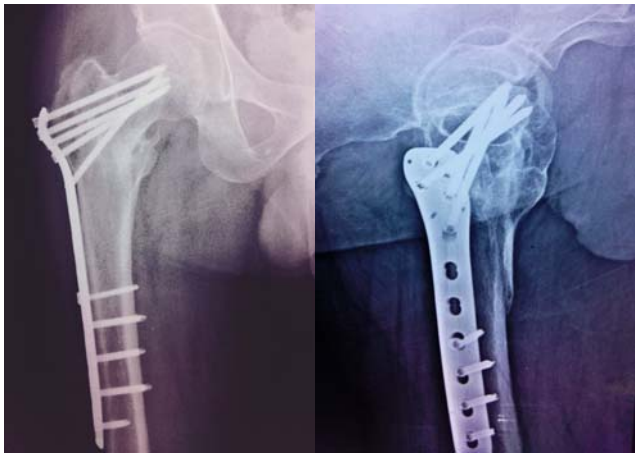


Pre-Operative

Case 2



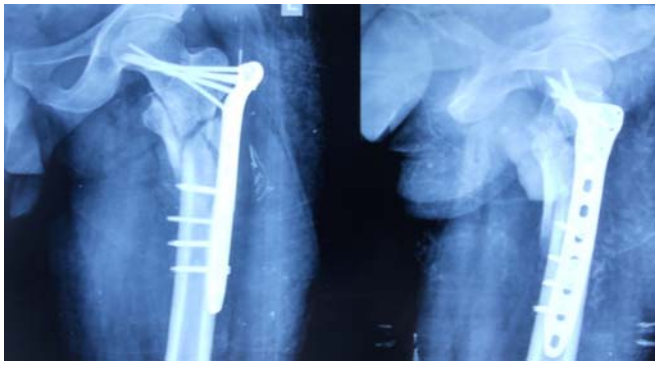
Pre-Operative



Post-Operative 3mth

Case 4

Pre-Operative



Post-Operative

Post-Operative 3mth

Conclusion

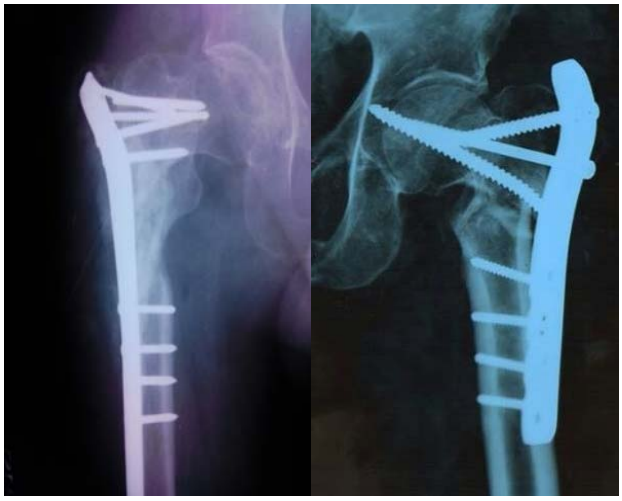
As per study, proximal femoral LCP is a good option for proximal femoral fractures in the elderly patients especially for severe communited fracture and osteoporosis. Proximal femoral LCP provides the surgeon with flexibility to achieve angular stability or axial compression with plate to bone apposition.

However the PFLCP has a learning curve and initial surgery should be performed under guidance. But once surgeon gets familiar with technique and instrumentation the complications and surgical time is significantly reduced. The PFLCP does not provide any advantage in time taken for union compared to other fixation methods and has a high cost which limits its wide spread use in developing country like ours.

Few of the disadvantages associated with PF LCP are relatively difficult operative technique and mechanical hardware failure with varus collapse.

In light of these observations, one can conclude that the proximal femoral LCP, despite few unfavourable results and complications, is a satisfactory method of treatment in unstable proximal femoral fractures with severe communition and osteoporosis. It requires close monitoring during pre, intra, post-operative period to avoid complications which can be managed.

Complications



Screw Breakage Varus Collapse

Clinical Photographs

Incision One Legged Standing

Active Straight Leg Raising

Sitting Cross Legged

Squatting

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