

Use of Locking Compression Plate in the Surgical Management of Proximal Humerus Fracture

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Abstract

Aim: The aim of the current research is to assess the functional outcome of proximal humerus fractures treated by locking compression plate. *Materials & Methods:* Present Prospective research including subjects who are above 18 years with proximal humerus fractures admitted to tertiary care institute of Bhuj, Kutch. Sixty cases of fractures of proximal humerus were operated by open reduction and internal fixations with Locking Compression Plate were assessed. *Results:* Most of the subjects in the present study were males, old aged, with Road Traffic Accidents being the most common form of injury, concerning 2 part, 3 part and 4 part fractures of proximal humerus. The fractures united in all 30 patients. Excellent and satisfactory results were observed in 76.7% of patients with unsatisfactory results in 23.3% according to Neer's criteria. There were 100% union rates and negative failures. *Conclusion:* Compression plate is an beneficial implant in proximal humeral fractures owing to angular stability, predominantly in comminuted fractures and in Osteoporotic bones in elderly patients, consequently permits early mobilization.

Keywords: Proximal Humerus Fractures; Open Reduction; Internal Fixation

Introduction

Proximal humerus fractures are commonly occurring fractures occurring in the skeleton. They comprised for around 4-5% of the all fracture. Incidence of fracture is frequent in elderly due to decreased bone density. However it can take place in younger age group subsequent elevated velocity trauma.¹ Since rising incidence of elevated velocity trauma, the fracture prototype in proximal humerus fracture is becoming complex.²

The Management is more notorious for articular fractures which bear a elevated threat of the humeral head necrosis. A review of published outcome proposed that there is no collectively established form of management.³ Conservative management may be associated with non union, malunion, and avascular necrosis resulting in painful dysfunction. The surgery should be performed as rapidly as the patients general condition allow. A hindrance

of quite a few days makes reduction extra complicated and a considerable stoppage results in absorption of bone, making secure internal fixation impossible.⁴

The objective of the osteosynthesis is to diminish the displacement of each fragment and clutch it in place with an implant.⁵ Therefore the larger tuberosity fragment which has typically been displaced proximally and rotated upward by rotator cuff muscles inserted into it, fixed to the chief humeral head fragment, slighter tuberosity fragment likewise displaced by subscapularis is fixed.

Three & four part fractures represent 13 to 16% of proximal humeral fractures. Management options for these displaced fractures comprise open reduction and fixation. for the most part of the unfortunate results following open reduction and internal fixation of three part fracture are owing to defective method.⁶

In a three or four part fracture dislocation when the head of the humerus is entirely devoid of any blood supply it can be replaced by a humeral prosthesis. Though the goal of Proximal Humerus fracture fixation should be steady reduction permitting premature mobilization. Present study conducted to analyze fractures of the proximal humerus that were Managed with the locking compression plate and documents their clinical and functional outcome. The objective of the study is to examination the effectiveness and purposeful conclusion of locking compression plate in proximal humerus fractures.

Materials & Methods

Source of the data: All patients satisfying the inclusion criteria admitted in tertiary institute of Gujarat during the study era. Clinical and Radiological assessment were done. Fractures classified by Neer's classification. Routine investigations were done to get fitness for surgery. Patients go for Open reduction internal fixation with locking Compression plate for the continued fracture under general anaesthesia. Post operative physiotherapy followed as per etiquette, to assess the functional outcome. A least of 30 cases was studied.

Inclusion criteria were: Two part, three part, and four part proximal humeral fractures.

Exclusion criteria were: Related humerus shaft fracture linked neurovascular injury

On admittance of the patient a cautious history was draw out from the patients and entourage of injury and the strictness of trauma. After that patients were evaluated clinically to assess their general condition and the limited injury. The general condition of the patient and the vital signs were recorded. The local examination of injured shoulder was performed for swelling, abnormality, loss of function and distorted attitude. Radiograph of proximal humerus were engaged and fractures were classified according to Neer's classification.

Next the limb was immobilized in U-slab and arm-pouch. The patient was taken for surgery after routine investigation and after obtaining physician fitness towards surgery. The consent for surgery was also taken from the patient and attendants following elucidation and probable difficulties. Injection tetvac and antibiotics were given 1 hour preoperatively. General anaesthesia was utilized in all patients. Patients positioned was supine one and on operating table with lodge a sandbag under

the spine and medial border of scapula to push the pretentious side forward while let the arm to fall backward. Surgical approaches were used is Deltopectoral approach.

Statistical analysis: The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages, means and standard deviations. For all tests; confidence level and level of significance were set at 95% and 5% respectively.

Results

Thirty subjects with closed displaced proximal humerus fractures were managed by Open reduction and Internal Fixation with locking compression plate.

Age group of the participants were 30 to 70 years. Proximal humerus fractures had high frequency in the 41 to 50 age group. The incidence of the study was as follows (Table 1). From 60 cases there were 34 males and 26 females (Table 2). Right sided was involved in extra patients. 18 cases had right side involved. Not any had both the sides involved in the equivalent patient (Table 3). Majority of the injuries were due to RTA and additional reasons were fall from height and subsequent a slip and fall (Table 4).

Table 1: Age distribution of patients

Age in years	Number of patients	%
31-40	14	23
41-50	20	33
51-60	18	31
61-70	4	13
Total	60	100

Table 2: Sex distribution of patients

Gender	No. of patients	%
Male	34	57
Female	26	43
Total	60	100

Table 3: Side involved

Side involved	No. of Patients	Percentage
Left	16	27
Right	44	73
Total	60	100

Table 4: Mode of injury

Mode of injury	No. of patients	%
RTA	32	54
FALL	28	46
Total	60	100

Discussion

The incidence of proximal humerus fractures has augmented in previous few years owing to changes in life style and amplifies in road traffic accidents. Majority of the proximal humerus fracture which are un-displaced and conservatively managed.⁷

Numerous studies have revealed that the displaced fracture of the proximal humerus have a deprived functional prognosis when left unprocessed due to brutal displacement of fragments.⁸ Nevertheless, with the intend of getting anatomically precise reductions, quick healing and early restoration of function, is the favoured modality of Management in general, open reduction and internal fixation, even though not in all Institution, have acquiesces sensible results. The most excellent results are produced if the fracture is finely reduced and planned rehabilitation program followed. Our study was performed to measure the results of two part, three part and four proximal humeral fracture managed by open reduction internal fixation by locking compression plate.

Proximal humerus fractures take place frequently in elderly age group. 19 were from age Group of 41 to 60 years subsequently by 4 patients in above 60 yrs. The standard age of patient was 49 yrs. Further as with former studies, present research described a superior incidence of fractures in men than in women. The gender ratio was 1.3: 1. This advanced ratio can be described by a superior participation of male in day to day activities in compare to female.

The final results are graded according to Neer scoring criteria. We had good to excellent results in 23 of managed in our institution. All patients with outstanding results and acceptable results had normal muscle function and functional range of movement according to Neer's Criteria.

Conclusion

The present study was performed to assess functional out come and problems subsequent surgical management of proximal humerus fracture by locking compression plate. In Proximal humerus locking compression plate locking of the threaded heads of the screws in the plate itself endow with for a construct with angular and axial stability, get rid of the opportunity of screw toggling, or sliding of the screws in the plate holes. Locking compression plate is mechanically and biologically an advantageous implant in proximal humeral fractures particularly in comminute 91 fractures and in osteoporotic bones in elderly patients, thus allowing early mobilization.

References

1. Cummings SR, Melton LJ. Epidemiology and outcomes of osteoporotic fractures. *The Lancet*. 2002;359:1761-7.
2. Srivastava D, Yadav S, Gupta A. Evaluation of Clinical and Radiological Outcome of Fracture Proximal Humerus by Locking Compression Plate Taking into Consideration of Biomechanics of the Glenohumeral Joint. *Journal of Bone and Joint Diseases*. 2017 Jan-June;32:50-5.
3. Dhanda MS, Nadeem A, Dhingra A. Results of proximal hum fixation in Neer's two proximal humerus fracture analysis of twenty patients. *IAIM*. 2015;2(5):112-20.
4. Wiles P. The surgery of the osteo-arthritis hip. *British Journal of Surgery*. 1958;45:488-97.
5. Ilizarov GA. *Transosseous osteosynthesis: theoretical and clinical aspects of the regeneration and growth of tissue*: Springer Science & Business Media. 2012.
6. Garden RS. Low-angle fixation in fractures of the femoral neck. *The Journal of Bone and Joint Surgery British Volume*. 1961;43:647-63.
7. Jagannath Nalawade R. *Study of Functional Outcome of Surgical Management of Proximal Humerus Fracture By Various Modalities*. 2013.
8. Resch H, Povacz P, Fröhlich R, *et al*. Percutaneous fixation of three-and four-part fractures of the proximal humerus. *The Journal of bone and joint surgery British Volume*. 1997;79:295-300.

