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Short term outcome of use of proximal humerus locking plate as a treatment of proximal humerus fracture using constant score

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Abstract
Objective: This study focuses on short term outcome of use of proximal humerus locking plating as a treatment of proximal humerus fracture using Constant Score.
Introduction: Proximal humerus fractures are one of the most common osteoporotic fractures. The major goal in the treatment of this fracture is to promote complication free healing to recreate a pain free mobile, stable and functional shoulder joint. We study the outcome of these fractures treated with proximal humerus locking plate.
Methodology: A cohort of 20 proximal humerus fracture, treated with proximal humerus locking plate between Sep 2015 to Sep 2016 were analysed for minimum of 6 months and final result was analysed using Constant Score.
Results: 75% patients had satisfactory results. Assessment was done using Constant Scoring System. No major complication was noted whatsoever.

Keywords: Proximal humerus locking plate, Constant score, NEER'S Classification

Introduction
Proximal humerus fractures are one of the most common osteoporotic fractures, with annual incidence of between 63 to 105 fractures per 1,00,000 population per year, and account for 5% of all appendicular fractures[1].The major goal in the treatment of this fracture is to promote complication free healing to recreate a pain free mobile, stable and functional shoulder joint. The option of locking plate technology has become a growing trend for the treatment of proximal humerus fractures. The ability of screws to lock to a plate gives angular stability to the construct and maintains postoperative reduction during early functional rehabilitation.

Methodology
This study focuses on short term outcome of use of proximal humerus locking plating as a treatment of proximal humerus fracture using Constant Score. The observational prospective study was conducted at tertiary care hospital between Sep 2015 to Sep 2016.20 patients with two part, three part and selected four part proximal humerus fractures, treated with proximal humerus locking plates were enrolled in this study based on following inclusion and exclusion criteria.

Inclusion Criteria
- Any patient with two part, three part and selected four part fracture of proximal humerus.

Exclusion Criteria
- Compound fractures of proximal humerus.
- Patients having fractures in clavicle or any other part of humerus in same limb.
- Patients with cervical spine injuries.

Radiographs were taken and fracture was classified according to Neer's Classification. Preoperative work up including blood investigations, chest radiographs, ECG and

preanaesthetic check up was done. Preoperatively antibiotics were given as per hospital protocol. All patients were operated with proximal humerus locking plates. Postoperative care inclusive of antibiotic support and dressing was done. The elbow, wrist and hand mobilization was begun immediately with assisted passive shoulder rotation, flexion, and abduction exercises beginning at around 1 week. Active shoulder isometric exercises were begun at 3 weeks, progressing to isotonic strengthening and stretching exercises at 6 to 12 weeks. Regular follow up was done at 1 month, 3 months and 6 months and radiographs were taken. The functional outcome was assessed using constant score.

Observation and Analysis

20 cases of proximal humerus fractures fixed using proximal humerus locking plates were included in the study.

Among those 9 patients were between 20 to 40 years of age, 8 patients were between 41 to 60 years of age and 3 patients were between 61 to 80 years of age. Among 20 patients 14 were male and 6 were female. Among 20 patients 14 had vehicular accidents, 5 had fall from height and 2 had physical assault.

Neer's Classification for Proximal Humerus

Neer's classification	No. of patients	Percentage
2 part	8	40
3 part	10	50
4 part	2	10

Neer's Classification and Constant Score

Neer's Classification	Constant Score
2 part	70.33
3 part	68.22
4 part	62.00

Final Result (Evaluated by Constant scoring system)

Total Score	Result	No. Of Patients	Percentage
51-60	Poor	5	25%
61-70	Good	8	40%
>71	Excellent	7	35%

Complication

Complications	Patients	Percentage
Non-union	0	0%
Malunion	0	0%
Implant failure	0	0%
Infection	2	10%
Stiffness	2	10%
Pain	8	40%
None	8	40%

Preoperative X-Ray

Postoperative X-Ray

Discussion

In our study 70% fractures were associated with vehicular trauma and 25% were with fall from height. All of them were treated using proximal humerus locking plates. All fractures healed uneventfully. Average union time was 90 days. In our study 45% patients had forward flexion possible upto 120 degree while 50% patients had more than 120 degree.5% patients had less than 90 degree of forward flexion. Also 70% patients had abduction of upto 120 degree, among them 20% had less than 90 degree.30% patients had abduction more than 20 degree. In our study,50% patients had strength between 11-15 lbs, while 15% had strength between 16-20 lbs. Constant Score showed,7 excellent(35%),8 good(40%) and 5 poor (25%)

Results.

Conclusion

Majority of patients were in age group of 20 to 50 years with vehicular trauma as common mode of injury. No major complication was recorded during follow up period and 75% patients had satisfactory results at final follow up. Limitations of this study were small population(20 patients) ans short term follow up(6 months).To conclude locking plate fixation is a good surgical option for the management of proximal humerus fractures. Medial support is vital when using this method of fixation to minimize complications. Careful adherence to technical aspects, especially screw position, is vital because the use of better bone stock in the inferomedial region of the humeral head may reduce hardware complications, especially in patients with osteoporosis.

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