UTTAR PRADESH JOURNAL OF ZOOLOGY

42(2): 13-17, 2021
ISSN: 0256-971X (P)

COMPLEX PROXIMAL HUMERUS FRACTURES TREATED WITH PLATING AND CONSERVATIVE MEANS

SANDIP PATIL[1*], S. G. TAKALE[1], V. S. MANE[1], PRASHANT D. I. PANDEY[1] AND AANSHUL PANCHOLIYA[1]

[1]Department of Orthopaedics, Krishna Institute of Medical Sciences, Karad, Maharashtra, India.

AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. Authors SP and SGT designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors VSM, PDIP and AP managed the analyses of the study. Author AP managed the literature searches. All authors read and approved the final manuscript.

Article Information

Editor(s):
(1) Dr. Ana Cláudia Correia Coelho, University of Trás-os-Montes and Alto Douro, Portugal.
Reviewers:
(1) Hossein Aslani, Tabriz University of medical science, Iran.
(2) Adam Uba Muhammad, Aminu Dabo College of Health Sciences and Technology, Nigeria.

Received: 16 November 2020
Accepted: 22 January 2021
Published: 13 February 2021

Original Research Article

ABSTRACT

The most of proximal humerus fractures are minimally displaced, low-energy osteoporotic fractures and are successfully treated with conservative care. However, for those with mild to extreme displacement, appropriate care for the patient has not been completely explained. A prospective, comparative study was conducted with 50 patients to compare and evaluate functional outcome of complex proximal humerus fractures treated with plating and conservative method in elderly. The patients were selected randomly and were divided in the following two groups of 25 patients each: Group A: Cases of complex proximal humerus fractures treated conservatively; Group B: Cases of complex proximal humerus fractures treated with plating. Locking plate is the recommended implant for comminuted proximal humerus fractures. In this study, the effects of locked plate fixation were close to those of non-operative care. Early physiotherapy and a proper rehabilitation program are key to a stable working result.

Keywords: Proximal humerus fractures; plating; trauma.

1. INTRODUCTION

Proximal humerus fractures are seen most commonly in the elderly population, following a low energy fall [1,2]. Proximal humerus fractures represent approximately 5% of all fractures and occur in a bimodal frequency with greatest incidence in the elderly population [1,3,4]. More than 70% of patients with these fractures are older than 60 years of age, 75% are women, and the fractures are often related to osteoporosis [5,6]. For this elderly population the goal of treatment of proximal humeral fractures is to

**Corresponding author: Email: Sandippatil33082@gmail.com;*

maintain independence of daily living by achieving a painless shoulder with an adequate function.

2. AIM AND OBJECTIVES

Aim: Comparative study of functional outcomes of fractures treated with plating versus conservative for complex proximal humerus fractures in elderly.

Objectives: To evaluate functional outcome with plating and with conservative in complex proximal humerus fractures.

3. REVIEW OF LITERATURES

Fu T et al [7] in 2014 in a meta-analysis compared the benefits and risks of surgical or conservative methods for these patients. The authors found Six RCTs with 272 patients were included and analyzed. Fix studies with a PEDro score of 6 or more were of high quality.

Bagul RR et al. [8] in 2015 assessed the role of conservative treatment and operative treatment by locking compression plate in the management of these fractures, compared the results of conservative management versus locking plate osteosynthesis and evaluated the results of treatment in terms of clinical and radiological union as well as functional outcome.

Rodiaa F et al. [9] in 2016 did a retrospective study and evaluated clinical recovery and complications using the S3 locking plate in elderly patients. The authors found mean time of fracture healing was 12.4 weeks. The mean Constant score at 3, 6 and 12 months was 68, 73 and 75 respectively. No statistically significant difference in the clinical outcome was observed between the B and C fracture patterns ($p > 0.05$).

Tadvi ND et al. [10] in 2017 did a prospective study and evaluated the functional outcome and complications of proximal humeral locking plate used for healing proximal humerus fractures. The authors found mean age of the patients was 52 years. Male: female ratio was 1.5: 2. The most common mode of injury is low velocity trauma i.e. fall while walking or fall in bathroom seen in 13 patients. Average time for clinical union was 60 days, while average time for radiological union is 90 days taken in the study.

4. MATERIALS AND METHODS

A prospective, comparative clinical study was conducted with 50 patients to compare and evaluate functional outcome of complex proximal humerus fractures treated with plating and conservative method in elderly. The study was conducted between June 2015 to December 2016 at a tertiary health care centre. The patients were selected randomly and were divided in the following two groups of 25 patients each:

Group A: Cases of complex proximal humerus fractures treated conservatively.
Group B: Cases of complex proximal humerus fractures treated with plating.

5. METHODOLOGY

The diagnosis of fractures of complex proximal humerus fracture was done purely on X- rays

The subjects in the study, who have fulfilled inclusion and exclusion criteria, were selected for the study.

6. OBSERVATION AND RESULTS

Majority of the patients (36%) in Group A were from the age group of 61-70 years followed by 28% from the age group of 71-80 years, 20% from the age group of 81-90 years and 16% from the age group of 51-60 years. The mean age in Group A was 69.4±9.78 years.

Majority of the patients (40%) in Group B were from the age group of 61-70 years followed by 20% from the age group of 51-60 years and 13.3% each from the age groups of 71-80 years and 81-90 years. The mean age in Group B was 68.7±10.07 years. As per Student t test, there was no significant association between the groups ($p>0.05$) [Table 1].

Table 1. Distribution of patients according to age

Age (yrs)	Group A		Group B		p value
	N	%	N	%	
51-60	4	16%	5	20%	
61-70	9	36%	10	40%	
71-80	7	28%	6	13.3%	>0.05
81-90	5	20%	4	13.3%	
Total	25	100%	25	100%	
Mean ± SD	69.4±9.78		68.7±10.07		

Table 2. Distribution of patients according to sex

Sex	Group A		Group B		Chi- Square Statistic	p value
	N	%	N	%		
Male	20	80%	21	84%		
Female	5	20%	4	16%		
Total	25	100%	25	100%	0.135	>0.05

Majority of the patients in both groups were male. There were 80% and 84% male patients in Group A and Group B respectively whereas female patients constituted 20% and 16% of the study group respectively. There was no significant association between the groups as per Chi-Square test (p>0.05) [Table 2].

There was dominance of left side (60% and 64%) as compared to right side (40% and 36%) in both groups. There was no significant association between the groups as per Chi-Square test (p>0.05) [Table 3].

Road Traffic Accident was observed to be the main cause of fracture in both the groups (60% and 64% respectively) followed by fall (40% and 36% respectively). There was no significant association between the groups as per Chi-Square test (p>0.05) [Table 4].

In Group A, the duration of trauma to treatment in 16 (64%) and 5 (20%) patients was 1-3 and 4-6 days respectively and it was 7-9 and 10-11 days in 2 (8%) patients each respectively. The mean duration of trauma to surgery was 4.04±2.67 days.

Table 3. Distribution of patients according to laterality of fracture

Laterality of Fracture	Group A		Group B		Chi-Square Statistic	p Value
	N	%	N	%		
Right	10	40%	9	36%		
Left	15	60%	16	64%		
Total	25	100%	25	100%	0.085	>0.05

Table 4. Distribution of patients according to mode of injury

Mode of Injury	Group A		Group B		Chi-Square Statistic	p Value
	N	%	N	%		
RTA	15	60%	16	64%	0.085	>0.05
Fall	10	40%	9	36%		
Total	25	100%	25	100%		

Table 5. Duration of trauma to treatment

Duration (days)	Group A		Group B		p Value
	N	%	N	%	
1-3	16	64%	15	60%	
4-6	5	20%	4	16%	
7-9	2	8%	2	8%	
10-11	2	8%	4	16%	
Total	25	100%	25	100%	>0.05
Mean±SD	4.04±2.67		4.24±3.26		

Table 6. Distribution of patients according to Clinical Union

Clinical Union	Group A		Group B		Chi-Square Statistic	p Value
	N	%	N	%		
10-13 weeks	15	60%	16	64%		
14-17 weeks	6	24%	5	20%		
18-20 weeks	4	16%	4	16%		
Total	25	100%	25	100%		
Mean ± SD	13.2±3.01		13.4±3.11		0.123	>0.05

In Group B, the duration of trauma to treatment in 15 (60%) and 4 (16%) patients was 1-3 and 4-6 days respectively and it was 7-9 and 10-11 days in 2 (8%) and 4 (16%) patients respectively. The mean duration of trauma to surgery was 4.24±3.26 days. As per Student t-test, there was no significant association between the groups (p>0.05) [Table 5].

In Group A, the duration to clinical union in 15 (60%) and 6 (24%) patients was 10-13 and 14-17 weeks respectively and it was 18-20 weeks in 4 (16%) patients. The mean duration for clinical union in Group A was 13.2 weeks.

In Group B, the duration to clinical union in 16 (64%) and 5 (20%) patients was 10-13 and 14-17 weeks respectively and it was 18-20 weeks in 4 (16%) patients. The mean duration for clinical union in Group B was 13.4 weeks. There was no significant association between the groups as per Chi-Square test (p>0.05) [Table 6].

7. DISCUSSION

A prospective, comparative study was conducted with 50 patients to compare and evaluate functional outcome of complex proximal humerus fractures treated with plating and conservative method in elderly.

Majority of the patients in both groups were male. There were 80% and 84% male patients in Group A and Group B respectively whereas female patients constituted 20% and 16% of the study group respectively. There was no significant association between the groups as per Chi-Square test (p>0.05).

Patil SN et al. [11] prospective study on plating for displaced proximal humeral fractures reported most of the patients presented with age beyond 60 years. It was observed in this study that there was dominance of left side (60% and 64%) as compared to right side (40% and 36%) in both groups. There was no significant association between the groups as per Chi-Square test (p>0.05).

Patil SN et al. [11] prospective study on plating for displaced proximal humeral fractures found 57% of the patients presented with right sided humerus fracture. Most of the patients (70%) presented with duration of one day following injury. In the study, Road Traffic Accident was observed to be the main cause of fracture in both the groups (60% and 64% respectively) followed by fall (40% and 36% respectively). There was no significant association between the groups as per Chi-Square test (p>0.05).

Patil SN et al. [11] prospective study on plating for displaced proximal humeral fractures reported 56% of the patients presented with 2-part fracture, 37% with 3-part fracture and 7% with 4-part fracture of the proximal humerus according to Neer‘s classification. In the study, 20% and 12% patients in Group A had Diabetes Mellitus and Hypertension respectively whereas 16% and 24% patients in Group B had Diabetes Mellitus and Hypertension respectively. There was no significant association between the groups as per Chi-Square test (p>0.05).

Patil SN et al. [11] prospective study on plating for displaced proximal humeral fractures observed that, there was gradual increase in mean flexion, abduction, external rotation and internal rotation during subsequent follow up.

In the study, during 6 weeks follow-up period, 2 (8%) and 6 (24%) patients in Group A and Group B respectively had excellent score while 10 (40%) and 14 (56%) patients had good score. Moderate score was observed in 8 (32%) and 3 (12%) patients respectively whereas poor score was observed in 5 (20%) and 2 (8%) patients. During 6 months follow-up period, 7 (28%) and 9 (36%) patients in Group A and Group B respectively had excellent score while 14 (56%) and 13 (52%) patients had good score. Moderate score was observed in 3 (12%) and 2 (8%) patients respectively whereas poor score was observed in 1 (4%) patient each. There was increase in the functional outcome of patients in both the groups but the increase was statistically not significant (p>0.05).

8. CONCLUSION

Locking plate is an implant of choice for comminuted proximal humerus fractures. Plates with attached (locked) screws may provide improved fracture stability and healing. Locking the screw to the plate mechanically recreates a point of cortical bone contact, which may be useful in the poor cancellous bone of the proximal humerus. Patients can allow early mobilization so less chances of joint stiffness. In the present study, the outcomes of locked plate fixation were similar to those of nonoperative treatment. Early physiotherapy and good rehabilitation programme is vital to get a good functional outcome.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Horak J, Nilsson BE. Epidemiology of fracture of the upper end of the humerus. Clin Orthop Relat Res. 1975;112:250–3.
2. Lind T, Kroner K, Jensen J. The epidemiology of fractures of the proximal humerus. Arch Orthop Trauma Surg. 1989;108(5):285–7.
3. Crispin Ong, Christopher Bechtel. Three- and four-part fractures have poorer function than one-part proximal humerus fractures. Clin Orthop Relat Res. 2011;469:3292–3299.
4. Barrett JA, Baron JA, Karagas MR, Beach ML. Fracture risk in the U.S. Medicare population. J Clin Epidemiol. 1999;52:243–249.
5. Kristiansen B, Barfod G, Bredesen J, Erin-Madsen J, Grum B, Horsnaes MW, Aalberg JR: Epidemiology of proximal humeral fractures. Acta Orthop Scand. 1987;58:75-7.
6. Jones G, Nguyen T, Sambrook P, Kelly PJ, Eisman JA: Progressive loss of bone in the femoral neck in elderly people: longitudinal findings from the Dubbo osteoporosis epidemiology study. BMJ. 1994;309:691-5.
7. Fu T, Xia C, Li Z, Wu H. Surgical versus conservative treatment for displaced proximal humeral fractures in elderly patients: a meta-analysis. International Journal of Clinical and Experimental Medicine. 2014;7(12):4607-4615.
8. Bagul RR, Joshi U, Kakatkar V, Deo S. Comparative Study of Management of Proximal Humerus Fractures in Elderly by Conservative Method Versus Operative Locking Compression Plate. J Pharm Biomed Sci. 2015;05(11):831–838.
9. Rodiaa F, Theodorakisb E, Touloupakisb G, Ventura A. Fixation of complex proximal humeral fractures in elderly patients with a locking plate: A retrospective analysis of radiographic and clinical outcome and complications Chinese Journal of Traumatology. 2016;19(3):156-159.
10. Tadvi ND, Deveshawar RN, Patel YC. Treatment of proximal humerus fracture using proximal humerus locking plating. Int J Res Orthop. 2017;3:670-5.
11. Patil SN, Srinivas P, Bhadbade V. A prospective study of 30 cases of PHILOS plating for displaced proximal humeral fractures. International Journal of Orthopaedics Sciences IJOS. 2017;3(3):86-91.