

A study of single extra articular humerus plating and bipillar plating for distal humerus fracture at tertiary health care centre

Vaibhav Bhadbhade¹, Sandeep D N^{2*}, Dayanand M³

^{1,2}Senior Resident, ³Assistant Professor, Department of Orthopaedics, BMCRI, Bangalore, Karnataka, INDIA.

Email: vaibhavrb9@gmail.com

Abstract

Background: The management of distal humeral fractures has evolved over the last few years. Various modalities of treatment are non surgical and surgical methods. In this study we compared single extra articular humerus plating and bipillar plating for distal humerus fracture. **Aim and objective:** To compare single extra articular humerus plating and bipillar plating for distal humerus fracture at tertiary health care centre **Methodology:** Total 60 patients with distal humerus fracture visiting orthopaedics department of a tertiary care center were included in the study. Patients were grouped into two groups. Group A included humerus fracture treated with single extra articular plating and Group B included patients treated by bipillar plating. Outcome was compared in both the groups with respect to duration of surgery, total blood loss and clinical improvement. **Results and discussion:** Both the groups were comparable with respect to age and sex (P value >0.05). Mean duration of surgery and Mean operative blood loss was significantly less in Group A than Group B (P<0.05). Mayo Elbow Performance Score, excellent score was seen in 29 patients from group. Radial nerve injury was not observed in any patient.

Key Word: humerus plating, bipillar plating.

*Address for Correspondence:

Dr. Sandeep D N, Senior Resident, Department of Orthopaedics, BMCRI, Bangalore, Karnataka, INDIA.

Email: vaibhavrb9@gmail.com

Received Date: 11/02/2019 Revised Date: 02/03/2019 Accepted Date: 27/04/2019

DOI: <https://doi.org/10.26611/10201021>

Access this article online

Quick Response Code:



Website:

www.medpulse.in

Accessed Date:
02 May 2019

INTRODUCTION

A distal humerus fracture occurs when there is a break anywhere within the distal region (lower end) of the humerus. The bone can crack just slightly or break into many pieces (comminuted fracture). The broken pieces of bone may line up straight or may be far out of place (displaced fracture). Distal humerus fractures are most often caused by falling directly on the elbow, Receiving a direct blow to the elbow from something hard or falling on an outstretched arm. Distal humerus fractures are also

sometimes caused by weak or insufficient bone in conditions like osteoporosis. Symptoms seen in these patients are Swelling, Bruising, Tenderness to the touch, Stiffness, A feeling of instability in the joint, as if your elbow is going to "pop out" Methods of management of distal humerus fractures include conservative management using plaster cast immobilization or functional bracing, plate osteosynthesis and intra-medullary nailing¹⁻⁴ Functional bracing, though advocated, may not provide adequate stability and acceptable alignment due to the distal extent of these fractures. Therefore, operative stabilization of these fractures is rational and is favoured by many authors.⁵⁻¹⁰ Jawa *et al*³ compared the use of functional bracing and plate fixation for extra-articular distal-third diaphyseal fractures of the humerus. They concluded that for extra-articular distal-third diaphyseal humeral fractures, surgical treatment achieves more predictable alignment and potentially quicker return of function but risks iatrogenic nerve injury and infection and the need for reoperation The MEPC Mayo Elbow Performance Score is one of the most commonly used physician-based elbow

How to cite this article: Vaibhav Bhadbhade, Sandeep D N, Dayanand M. A study of single extra articular humerus plating and bipillar plating for distal humerus fracture at tertiary health care centre. *MedPulse International Journal of Orthopedics*. May 2019; 10(2): 22-24. <https://www.medpulse.in/Orthopedics/>

rating systems.¹¹ This index consists of four parts-pain (with a maximum score of 45 points), ulnohumeral motion (20 points), stability (10 points) and the ability to perform five functional tasks (25 points). Present study was conducted to compare single extra articular humerus plating and bipillar plating for distal humerus fracture.

METHODOLOGY

Total 60 patients were studied in our study which was conducted from July 2017 to June 2018 including 6 months follow-up. All patients with humerus fracture visiting orthopaedics department of a tertiary care center Bangalore medical college and research institute, Bangalore were included in the study. Patients were grouped into two groups. Group A included humerus fracture treated with single extra articular plating and Group B included patients treated by bipillar plating.

Inclusion Criteria:

1. Patients with extra articular distal humerus fractures
2. Lost fracture patients
3. Fresh trauma up to 2 weeks

Exclusion Criteria

1. Age less than 18 years and above 60 years
2. Open fracture
3. Osteoporotic patients
4. Pathological fractures
5. Patients not willing to participate.

Study was approved by ethical committee. A valid written consent was taken from the patients after explaining study and operative procedure to them. Data was collected with pre tested questionnaire. Data included socio-demographic data, detailed clinical history. Patients undergone pre operative assessment before surgery. Tourniquets were not used. Posterolateral approach was used and skin incision was done in between lateral epicondyle and olecranon 2.5 cm distally to elbow joint. Triceps was spited and lifted to reach fracture site. Periosteum was isolated through use of periosteum elevator and proximal and distal humerus was aligned and fracture was reduced with the use of reduction clamps and plates. Plates were fixed. in Group A single extra articular plating was done while in Group B bipolar plating was done. Post operative physiotherapy and assisted exercise were allowed after radiological bone union. All the patients were followed after 15 days for suture removal

and later on every monthly for ortho-clinico radiological correlation till fracture got united. Union of fracture was defined as formation of bridging callus on two radiographic antero-posterior and lateral views and clinically defined as no pain at fracture site. Clinical examination and follow up included patient satisfaction, visual analogue scale, range of motion over elbow joint, and mayo elbow performance score (MEPS) was used for functional assessment of elbow and shoulder joint. Mean duration of surgery, mean blood loss during procedure and post-operative complications were noted in both the groups. Data was analysed with appropriate statistical tests.

RESULTS

Total 60 patients were studied. Mean age of the patient in group A was 42.72 ± 3.51 years. Mean age of the patients in Group B was 41.84 ± 3.15 years. Majority patients were male in both the groups. Out of all 40 patients were male and 20 patients were female. Both the groups were comparable with respect to age and sex (P value >0.05). Table 1 shows comparison of Group A and Group B with respect to different parameters. Mean duration of surgery was significantly less in Group A (92.43 ± 13.27 mins) than Group B (183.53 ± 5.38 mins) (P <0.05). Mean operative blood loss in Group A was 178 ± 42 ml while in Group B it was 215 ± 36 ml. Difference between these two groups is statistically significant (p <0.05). Mean fracture union time was 23.2 ± 1.1 and 22.4 ± 1.2 in Group A and Group B respectively. Bone impingement was not seen in Group A. only one patient had Bone impingement in Group B. Table 2 shows comparison of both the groups according to Mayo Elbow Performance Score. Score of >90 was considered as excellent and score of 75-89 was considered as good. In our study we found that 29 patients from group A were with excellent score and 27 patients from Group B were with excellent score. Good score was achieved by 1 patient in Group A and 3 patients in Group B. Post operative complications were less in our study. One patient had non union of fracture this patient undergone revised surgery. 2 patients had post operative site infection these patients were treated with higher antibiotics. Radial nerve injury was not observed in any patient.

Table 1: Comparison of Group A and Group B according to various parameters

Sr no	Parameters	Group A	Group B	P value
1	Mean duration of surgery (mins)	92.43 ± 13.27	183.53 ± 5.38	<0.05
2	Mean operative blood loss (ml)	178 ± 42	215 ± 36	<0.05
3	Mean fracture union time (weeks)	23.2 ± 1.1	22.4 ± 1.2	>0.05
4	Bone impingement	Absent	One patient	-

Table 2: Comparison of Group A and Group B according to Mayo Elbow Performance Score

Sr no	Mayo Elbow Performance Score	Interpretation	Group A	Group B
1	>90	Excellent	29	27
2	75-89	Good	01	03
3	60-74	Fair	00	00
4	< 60	Poor	00	00

DISCUSSION

In our study Mean duration of surgery was significantly less in Group A (92.43 ± 13.27 mins) than Group B (183.53 ± 5.38 mins) ($P < 0.05$). Mean operative blood loss in Group A was 178 ± 42 ml while in Group B it was 215 ± 36 ml. Difference between these two groups is statistically significant ($p < 0.05$). Similar findings were seen in previous studies where they found that mean operative time and blood loss was less.^{9,10} According to Mayo Elbow Performance Score. Score of > 90 was considered as excellent and score of 75-89 was considered as good. In our study we found that 29 patients from group A were with excellent score and 27 patients from Group B were with excellent score. Good score was achieved by 1 patient in Group A and 3 patients in Group B. Post operative complications were less in our study. One patient had non union of fracture this patient undergone revised surgery. 2 patients had post operative site infection these patients were treated with higher antibiotics. Operative site infection was seen in two patients only. Functional bracing was not seen. Similar findings were observed in previous studies like Fjalestad T *et al*¹² and Papasoulis E *et al*¹³ Radial nerve palsy was not observed in any patient. Similar results were seen in previous study.¹² Meloy GM *et al* observed that The single plating group had an overall better range of movement than the dual plating group, and the overall complication rate was significantly greater in the latter.¹⁴

CONCLUSION

Single extra articular humerus plating is better than bipillar plating for distal humerus fracture as it has less duration of surgery and less blood loss with good performance score.

REFERENCES

1. Stewart MJ, Hundley JM, Tennessee M. Fractures of the humerus-A comparative study in methods of treatment. J Bone Joint Surg Am. 1955; 37-A(4):11.
2. Sarmiento A, Horowitch A, *et al*. Functional bracing for comminuted extra-articular fractures of the distal third of the humerus. J Bone Joint Surg Br. 1990; 72(2):283–287.
3. Ring D, Harris M, Doornberg J, McCarty P, Jawa A. Extra-articular distal-third diaphyseal fractures of the humerus. A comparison of functional bracing and plate fixation. J Bone Joint Surg Am. 2006; 88-A: 2343–2347.
4. McKee MD. Fractures of the shaft of the humerus. In: Bucholz RW, Heckman JD, Court-Brown CM, editors. Rockwood and green's fractures in adults. Philadelphia: Lippincott Williams and Wilkins; 2006. pp. 1117–1159.
5. Ali E, Griffiths D, Obi N, Tytherleigh-Strong G, Van Rensburg L. Nonoperative treatment of humeral shaft fractures revisited. J Shoulder Elbow Surg. 2015; 24: 210–4.
6. Jawa A, McCarty P, Doornberg J, Harris M, Ring D. Extra-articular distal-third diaphyseal fractures of the humerus. A comparison of functional bracing and plate fixation. J Bone Joint Surg Am. 2006; 88:2343–7.
7. Komer J, Lill H, Müller LP, Hessmann M, Kopf K, Goldhahn J, *et al*. Distal humerus fractures in elderly patients: Results after open reduction and internal fixation. Osteoporos Int. 2005; 16(Suppl 2):S73–9.
8. Scolaro JA, Voleti P, Makani A, Namdari S, Mirza A, Mehta S. Surgical fixation of extra-articular distal humerus fractures with a posterolateral plate through a triceps-reflecting technique. J Shoulder Elbow Surg. 2014;23: 251–7.
9. Capo JT, Debkowska MP, Liporace F, Beutel BG, Melamed E. Outcomes of distal humerus diaphyseal injuries fixed with a single-column anatomic plate. Int Orthop. 2014;38: 1037–43.
10. Fawi H, Lewis J, Rao P, Parfitt D, Mohanty K, Ghandour A. Distal third humeri fractures treated using the Synthes™ 3.5-mm extra-articular distal humeral locking compression plate: Clinical, radiographic and patient outcome scores. Shoulder Elbow. 2015;7: 104–9.
11. Morrey BF, An KN, Chao EYS. Functional evaluation of the elbow. In: Morrey BF, editor. The elbow and its disorders. 2. Philadelphia: W. B. Saunders; 1993. pp. 86–89.
12. Fjalestad T, Strømsøe K, Salvesen P, Rostad B. Functional results of braced humeral diaphyseal fractures: Why do 38% lose external rotation of the shoulder? Arch Orthop Trauma Surg. 2000; 120: 281–5.
13. Papasoulis E, Drosos GI, Ververidis AN, Verettas DA. Functional bracing of humeral shaft fractures. A review of clinical studies. Injury. 2010; 41:e21–7.
14. Meloy GM, Mormino MA, Siska PA, Tarkin IS. A paradigm shift in the surgical reconstruction of extra-articular distal humeral fractures: single column plating. Injury. 2013; 44: 1620–24.

Source of Support: None Declared
Conflict of Interest: None Declared