

ORIGINAL ARTICLE

MANAGEMENT OF FRACTURE OF HUMEROUS: COMPARISON OF DYNAMIC COMPRESSION PLATES WITH INTRAMEDULLARY INTERLOCKING NAILS

Ankur das¹, Saurabh Agarwal²

¹MS Orthopaedics Mayo institute of Medical Sciences, Barabanki, ²MS, Orthopaedics, Career Institute of Medical Sciences and Hospital, Lucknow, U.P., India

ABSTRACT:


Background: Fracture of humerus can be seen in any age group but most commonly seen in fifth decade of life. This study was conducted to compare intramedullary nails and compression plates in management of fracture of humerus bone.

Material & Methods: It consisted of 50 patients with open fractures shaft of humerus, periarticular fractures of humerus, fractures with associated neurovascular injury. 25 patients were treated with intramedullary interlocking nail. 25 patients were treated with dynamic compression plates. **Results:** In group I, main reason was road traffic accident (male- 8, female-3). Fracture due to fall was seen in 3 males and 5 females in group I and in 4 males and 3 females in group II. Work place injury was seen in 4 males and 2 females in group I and 3 males and 3 females in group II. The operative time was 106 minutes in group I and 95 minutes in group II. The mean blood loss was 220.54 with standard deviation of 40.5 in group I and 132.87 and standard deviation of 31.1 in group II. **Conclusion:** Author concluded that management of fracture of humerus found to be more effective with intramedullary interlocking nails. **Clinical Significance:** This article has highlighted the new treatment modality for fracture of humerus.

Key Words: compression plates, Fracture, humerus, intramedullary nails.

Corresponding Author: Dr. Ankur das, MS Orthopaedics Mayo institute of medical Sciences, Barabanki, India

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INTRODUCTION

Fractures of the shaft of the humerus represent 1 to 3% of all fractures. Fracture of humerus can be seen in any age group but most commonly seen in fifth decade of life. Management of humerus fracture includes both operative & non-operative management.¹ Humeral shaft fractures are treated successfully with conservative means but there is an indication for primary or secondary operative treatment in some cases.² Plate and screw fixation remains the gold standard for surgical treatment. The favorable results with internal fixation techniques and instrumentation have led to an expansion of surgical indications for such fractures and a dilemma about the procedure of choice.³

Due to minimal invasive treatments, simple procedure, undisturbed fracture hematoma, intramedullary nailing

(IMN) of the humerus became more popular over the last two decades.⁴

Lin⁵ in his study found 100% union rate in 73 fractures treated with either locked intramedullary nails or compression plates and screws.

In literature, few studies are there comparing intramedullary interlocking nail and dynamic compression plating in management of fracture of humerus bone.^{6,7}

This study was conducted to compare intramedullary nails and compression plates in management of fracture of humerus bone.

MATERIAL & METHODS

This study was conducted in department of orthopaedics. It consisted of 50 patients with open fractures shaft of humerus, periarticular fractures of humerus, fractures with associated neurovascular injury. 25 patients were treated

with intramedullary interlocking nail. 25 patients were treated with dynamic compression plates. Post operatively both groups were immobilised in U-slab for 2 weeks. The average follow-up was 6 months. Patients were followed up on 2nd week, 6th week, 12th week, and 24th week and assessed for pain at the fracture site using visual analogue score (VAS score), evidence of union. Sex, amount of blood loss, rate of infection, pain at the fracture site and post operative complications were discussed.

25 patients with fractures involving proximal, middle third and distal third were treated with a broad 4.5mm dynamic compression plate or LCP plates (group I). In physically small individuals with thin humerus, a narrow 4.5mm DCP were used. 25 patients were treated with intramedullary interlocking nails (group II).

Results obtained were subjected to statistical analysis (chi-square test). P value less than 0.05 was considered significant.

RESULTS

Table I shows distribution of patients in group I and group II. Group I consisted of 15 males and 10 females. Group II consisted of 17 males and 8 females.

Table I: Distribution of Patients

Group I		Group II	
Male	Female	Male	Female
15	10	17	8

Table II: Mode of injury in both groups

Mode Of Injury	Group I		Group II	
	Male	Female	Male	Female
Road traffic accident	8	3	10	2
Fall	3	5	4	3
Work place injury	4	2	3	3
TOTAL	25		25	

Table III: Operative time in both groups

Group I		Group II	
Operative Time	Std. Deviation	Operative Time	Std. Deviation
106 Mins	12.12	95 Mins	14.4

Table IV: Blood loss in both groups

Group I		Group II		P Value
Blood Loss (Mean)	Std. Deviation	Blood Loss (Mean)	Std. Deviation	
220.54	40.5	132.87	31.1	0.04

Table V: Postoperative complications in both groups

	Group I	Group II	P Value
Radial N. Palsy	5%	3%	0.5
Infection	2%	4%	0.6
Non Union	1%	2%	1

Table II shows reason for fracture of humerous. In group I, main reason was road traffic accident (male- 8, female- 3). Fracture due to fall was seen in 3 males and 5 females in group I and in 4 males and 3 females in group II. Work place injury was seen in 4 males and 2 females in group I and 3 males and 3 females in group II. The difference was not statistical significant between males and females in both groups.

Table III shows operative time in both groups. The operative time was 106 minutes with standard deviation of 12.12 in group I and 95 minutes with standard deviation of 14.4 in group II.

Table IV shows blood loss in both groups. The mean blood loss was 220.54 with standard deviation of 40.5 in group I and 132.87 and standard deviation of 31.1 in group II. The blood loss in group I was significantly high.

Table V shows postoperative complications in both groups. Radial nerve palsy was seen in 5% in group I and 3% in group II patients. Postoperative infection was seen in second weeks with 2% in group I and 4% in group II patients. Non union was seen in 1% in group I and 2% in group II patients. The difference was not statistical significant.

DISCUSSION

Humerous fractures are frequently seen during road accidents and can be well managed conservatively. There is a specific indication for surgical treatment. The surgical indications can be unacceptable reduction, associated vascular lesions, open fractures, radial nerve palsy, polytrauma patients, floating elbow and one patient with obesity who was at risk for developing a varus angulation.⁸ Surgical treatment management includes plate and screw fixation but nowadays intramedullary nailing is becoming the treatment of choice.⁹

In this study, we compared intramedullary nails and compression plates in management of fracture of humerus bone. This study was conducted in department of orthopaedics. It consisted of 50 patients with open fractures shaft of humerus, periarticular fractures of humerus, and fractures with associated neurovascular injury. 25 patients were treated with intramedullary interlocking nail. 25 patients were treated with dynamic compression plates. Post operatively both groups were immobilised in U-slab for 2 weeks. The average follow-up was 6 months. Patients were followed up on 2nd week, 6th week, 12th week, and 24th week and assessed for pain at the fracture site using visual analogue score (VAS score), evidence of union, duration of operating time, amount of blood loss, rate of infection, pain at the fracture site, time to achieve union, and post operative complications were tested.

In group I, main reason of fracture was road traffic accident (male- 8, female-3). Fracture due to fall was seen in 3 males and 5 females in group I and in 4 males and 3 females in group II. Work place injury was seen in 4 males and 2 females in group I and 3 males and 3 females in group II. The difference was not statistical significant between males and females in both groups. Road traffic accident was a common cause for such fractures in our and other similar studies.^{10,11} A variation in epidemiological features of humeral shaft fractures is noted with different geographical locations. Bhandari¹² et al in his study also found road traffic accident as main cause of fracture.

The operative time was 106 minutes with standard deviation of 12.12 in group I and 95 minutes with standard deviation of 14.4 in group II.

The operating time was more in group I in our study which is similar to study conducted by Lio. We also evaluated blood loss in both groups. The mean blood loss was 220.54 with standard deviation of 40.5 in group I and 132.87 and standard deviation of 31.1 in group II. The blood loss in group I was significantly high. Results of our study are similar to study conducted by Sommer¹³ C et al. We also analyzed postoperative complications in both groups. Radial nerve palsy was seen in 5% in group I and 3% in group II patients. Postoperative infection was seen in second weeks with 2% in group I and 4% in group II

patients. Non union was seen in 1% in group I and 2% in group II patients. The difference was not statistical significant. Results are similar to study conducted by Changulani M¹⁴ et al. but different to the results of Chao TC¹⁵ et al.

CONCLUSION: Author concluded that management of fracture of humerus found to be more effective with intramedullary interlocking nails.

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