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Original Research

A comparative analysis of humeral interlocking nail and compression plating in patients with fracture of shaft of humerus

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ABSTRACT:

Background: Approximately 3% of all fractures are humeral shaft fractures, which orthopedic surgeons frequently treat. This study compared humeral interlocking nail and compression plating in fracture of shaft of humerus patients. **Materials & Methods:** 74 patients with fracture of shaft of humerus of both genders were divided into two groups of 37 each. Group I underwent internal fixation by dynamic compression plating, with or without bone grafting and group II underwent internal fixation by humeral interlocking nail. Parameters such as mode of injury, range of elbow joint movements, and complications in both groups were recorded. The outcome was recorded as excellent, good, fair and poor. **Results:** Group I had 20 males and 17 females and group II had 19 males and 18 females. The range of movement pre-operatively in group I was 8-132 degrees and in group II was 4-130 degrees and post-operatively in group I was 4-136 degrees and in group II was 5-134 degrees. The mode of injury was RTA in 18 in group I and 20 in group II, fall in 12 in group I and 8 in group II and violence in 7 in group I and 9 in group II. Complications were shortening seen in 2 in group I and 1 in group II, implant failure 3 in group I and 2 in group II, superficial infection 1 in group I and 2 in group II, and deep infection 2 in group I and 3 in group II. The difference was significant ($P < 0.05$). The outcome was excellent 20 in group I and 19 in group II. Good in 17 in group I and 15 in group II, fair in 2 in group II and poor in 1 in group II. **Conclusion:** It was discovered that the best technique for stabilizing humeral shaft fractures was dynamic compression plating. It had a better course of treatment and fewer post-operative problems.

Keywords: Dynamic compression plating, humerus shaft, superficial infection

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INTRODUCTION

Approximately 3% of all fractures are humeral shaft fractures, which orthopedic surgeons frequently treat. Although there are specific circumstances where primary or secondary operative therapy may be indicated, it is widely accepted that non-operative treatment is the best option for the majority of humeral shaft fractures. With advancements in both non-surgical and operative therapy, treatment approaches for these injuries are always changing. High union rates can be achieved using plate fixation, but it necessitates significant open surgery in which the soft tissues are removed from the bone. Additionally, it offers a less stable fixation, particularly in cases of osteoporotic bone and when crutch walking is necessary. Nonetheless, some research suggests IMN as a common surgical technique using either retrograde or antegrade nailing, while other research indicates that IMN may result in damage of the shoulder joint and a poor union rate.

As a result, opinions on the effectiveness of plate fixation and IMN are still divided. Since open reduction and internal fixation (ORIF) with plates and screws has fewer complications and a quicker union time than intramedullary nailing, it is still regarded as the gold standard for surgical care. In the majority of cases of humeral shaft fractures treated closed or with open reduction and internal fixation, good to excellent outcomes have been documented. To choose the best course of action, factors such as the patient's features, the fracture pattern, related injuries, soft tissue state, and others must be taken into account. This study compared humeral interlocking nail and compression plating in fracture of shaft of humerus patients.

MATERIALS & METHODS

The present study consisted of 74 patients with fracture of shaft of humerus of both genders. Patients' consent was obtained before starting the study.

Data such as name, age, gender etc. was recorded. A thorough clinical examination and pre-operative assessment was done in all patients. Patients were divided into two groups of 37 each. Group I underwent internal fixation by dynamic compression plating, with or without bone grafting and group II underwent internal fixation by humeral interlocking

nail. Parameters such as mode of injury, range of elbow joint movements, and complications in both groups were recorded. The outcome was recorded as excellent, good, fair and poor. Results were statistically analysed. P value less than 0.05 was set significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Method	Dynamic compression plating	Humeral interlocking nail
M:F	20:17	19:18

Table I shows that group I had 20 males and 17 females and group II had 19 males and 18 females.

Table II Comparison of parameters

Parameters	Variables	Group I	Group II	P value
Range (in degree)	Pre- op	8- 132	4-130	0.04
	Post- op	4-136	5-134	
Mode of injury	RTA	18	20	0.05
	Fall	12	8	
	Violence	7	9	
Complications	Shortening	2	1	0.17
	Implant failure	3	2	
	Superficial infection	1	2	
	Deep infection	2	3	

Table II shows that range of movement pre-operatively in group I was 8-132 degrees and in group II was 4-130 degrees and post-operatively in group I was 4-136 degrees and in group II was 5-134 degrees. The mode of injury was RTA in 18 in group I and 20 in group II, fall in 12 in group I and 8 in group II and

violence in 7 in group I and 9 in group II. Complications were shortening seen in 2 in group I and 1 in group II, implant failure 3 in group I and 2 in group II, superficial infection 1 in group I and 2 in group II, and deep infection 2 in group I and 3 in group II. The difference was significant (P< 0.05).

Table III Assessment of treatment outcome

Outcome	Group I	Group II	P value
Excellent	20	19	0.05
Good	17	15	
Fair	0	2	
Poor	0	1	

Table III shows that outcome was excellent 20 in group I and 19 in group II. Good in 17 in group I and 15 in group II, fair in 2 in group II and poor in 1 in group II. The difference was significant (P< 0.05).

DISCUSSION

The recently created locking compression plate (LCP) system can provide better fixation stability than traditional DCP because of its uniquely designed hole combinations, which enable the system to be utilized as both a locked internal fixator and a regular DCP. One easy, secure, and reliable therapy for humeral shaft non-union is anterior plating. It is comparable to other procedures used to treat humeral shaft non-union in terms of healing time, and it does not involve substantial dissection of soft tissues or visibility of the radial nerve. This method, which places the plate on the anterior surface of the bone, is an alternative to osteosynthesis for humeral shaft non-union. This study compared humeral interlocking nail and compression plating in fracture of shaft of humerus patients.

We found that group I had 20 males and 17 females and group II had 19 males and 18 females. In the investigation by Hashib et al, internal fixation was performed on 15 patients using humeral interlocking nails (Group-A) and 14 cases using dynamic compression plating (Group-B). In 92.3% of cases, either group's functional outcome was good; in 7.7% of cases, it was bad. Infections occurred in 4 instances (30.8%) in group B that were treated with dynamic compression plating. Of the patients in group A, one patient (7.7%) experienced non-union as a result of a deep embedded infection. A total of 3 patients (23.1%) in group A experienced shortening that ranged from 1.5 to 4 cm. Of group B, shortening occurred in 2 cases (15.4%). There was one non-union member in every group. One dynamic compression (7.7%) had loose screws, but there was no implant

failure with interlocking nails. Out of group A, 1 patient (7.7%) experienced

We observed that the range of movement pre-operatively in group I was 8-132 degrees and in group II was 4-130 degrees and post-operatively in group I was 4-136 degrees and in group II was 5-134 degrees. The mode of injury was RTA in 18 in group I and 20 in group II, fall in 12 in group I and 8 in group II and violence in 7 in group I and 9 in group II. Complications were shortening seen in 2 in group I and 1 in group II, implant failure 3 in group I and 2 in group II, superficial infection 1 in group I and 2 in group II, and deep infection 2 in group I and 3 in group II. We found that outcome was excellent 20 in group I and 19 in group II. Good in 17 in group I and 15 in group II, fair in 2 in group II and poor in 1 in group II. Males made up 77% of the participants in Singiseti et al.'s study, and no clear side inclination was seen. About 85% of fractures were caused by traffic accidents, with domestic and other factors coming in second and third. Sixty-four percent of the fractures impacted the middle part of the humerus shaft and could all be classified as A3 or B2 on the AO grading system. Four instances (11.11%) had radial nerve palsy prior to surgery. Following stabilization, all cases with preoperative radial nerve palsy fully recovered, suggesting a neuropraxia type of injury. In the two instances where open reduction was performed for plating, the radial nerve was examined to ensure its integrity. In the interlocking nailing group, there was no evidence of postoperative radial nerve palsy. In one instance, postoperative radial nerve palsy was seen.

CONCLUSION

It was discovered that the best technique for stabilizing humeral shaft fractures was dynamic compression plating. It had a better course of treatment and fewer post-operative problems.

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