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ORIGINAL ARTICLE

Nailing versus plating in humerus shaft fractures: A prospective comparative study

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ABSTRACT:

Background: This study was conducted to compare the efficacy of Nailing versus plating in humerus shaft fractures. **Material and methods**: A prospective, comparative study was done to evaluate the therapy of acute humeral shaft fractures using antegrade interlocking nail fixation and dynamic compression plating. The mean duration of the follow-up period was one year, with a range spanning from 10 to 24 months. One hundred individuals diagnosed with closed acute humeral shaft fracture necessitating surgical intervention were subjected to either interlocking nailing or plating techniques for treatment. **Results**: Mean time of union was 18.35 weeks among patients of nailing group and was 16.23 weeks among patients of the plating group.Results were significantly better among the patients of the plating group. **Conclusion**: Plating yielded superior outcomes in the management of closed humeral shaft fractures as compared to the utilization of interlocking nails.

Keywords: nailing, plating, humerus, shaft, fracture.

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INTRODUCTION

The treatment of humeral shaft fractures is still controversial. In most of these fractures, treatment is nonsurgical. But in those cases where surgery is indicated, the election between rigid nails and plates with screws is difficult. Multiple studies on this topic have been published, but they usually conclude that there are no differences in outcomes by comparison. In addition, few investigations focus on the analysis of the final function in the affected shoulder. The comparisons of outcomes between nails and plates usually do not objectively report the shoulder range of motion (ROM).[1,2] The mostly used functional scores generally underestimate the movement loss, as it is feasible to achieve an "excellent" score, even when the patient loss is 30° of anterior flexion.[3,4]

Fractures of the humeral shaft are commonly encountered by orthopaedic surgeons, accounting for approximately 3% of all fractures.[5] Treatment methods for these injuries continue to evolve as advances are made in both non-operative and operative management. It is generally agreed that most fractures of humeral shaft are treated best non-operatively, although there are indications for primary or secondary operative treatment in some situations.[6-8] The encouraging results that have been reported with recent advances in internal fixation techniques and instrumentation have led to an expansion of surgical indications for such fractures and a dilemma about the procedure of choice.[7]Hence, this study was conducted to assess the comparison of Nailing versus plating in humerus shaft fractures.

MATERIAL AND METHODS

A prospective, comparative study was done to evaluate the therapy of acute humeral shaft fractures using antegrade interlocking nail fixation and dynamic compression plating. The mean duration of the follow-up period was one year, with a range spanning from 10 to 24 months. One Hundred individuals diagnosed with closed acute humeral shaft fracture necessitating surgical intervention were subjected to either interlocking nailing or plating techniques for treatment.All patients were advised on immediate postoperative shoulder and elbow exercises and radiographs were taken at regular intervals during follow-up. Rodriguez-Merchan criteria was used for comparing the outcome. The overall rating of excellent, good, fair and poor outcomes was based on scores of shoulder and elbow movements along with pain and disability after the procedure. All the results were recorded in Microsoft excel sheet followed by statistical analysis using SPSS software.

RESULTS

Mean age of the patients of the Nailing group and the Plating group was 45.3 years and 46.3 years respectively. Majority proportion of patients of both the study groups were males. Mean time of union was 18.35 weeks among patients of nailing group and was 16.23 weeks among patients of the plating group.Among patients of the nailing group, excellent, good, fair and poor results were seen in 22 percent, 42 percent, 24 percent and 12 percent of the patients respectively. Among the patients of the plating group, excellent, good, fair and poor results were seen in 26

percent, 66 percent, 2 percent and 6 percent of the patients respectively. Results were significantly better among the patients of the plating group.

Table 1: Time of union

Time of union (weeks)	Nailing group	Plating group
Mean	18.35	16.23
SD	2.75	2.38
p-value	0.000 (Significant)	

Table 2: Comparison of outcome

Outcome	Nailing group		Plating group	
	Number	Percentage	Number	Percentage
Excellent	11	22	13	26
Good	21	42	33	66
Fair	12	24	1	2
Poor	6	12	3	6
p-value	0.001 (Significant)			

DISCUSSION

Humeral shaft fractures are among the most common orthopedic injuries comprising between 1 and 3% of annual fractures and represent 20% of all humerus fractures.[9,10] There is a bimodal presentation, with the greatest concentration occurring as a result of a fall in the elderly patient and to a lesser but still significant degree high energy trauma in the younger population.[11] Most of these fractures can be managed non-operatively with operative treatment indicated for open fractures (seen in approximately 25% of cases), neurovascular injury, articular involvement, pathologic fractures, and symptomatic malunion or non-union in non-operatively treated fractures.[6-8]Intramedullary nailing for metastatic disease involving the diaphysis of long bones is often preferred for its biomechanical superiority and for its limited soft tissue violation. Nevertheless, some authors favor fixation with plate and screws over IMN for the humerus to minimize the impacts on rotator cuff and shoulder stiffness that result from the nail's point of insertion. The wider surgical exposure required with the plate procedure being thought to be of lesser consequences. This small series suggests no superiority of either type of fixations when evaluating the functional status, pain level and quality of life after surgery.[9- 12]Hence, this study was conducted to assess the comparison of Nailing versus plating in humerus shaft fractures.

In this study, mean age of the patients of the Nailing group and the Plating group was 45.3 years and 46.3 years respectively. Majority proportion of patients of both the study groups were males. Mean time of union was 18.35 weeks among patients of nailing group and was 16.23 weeks among patients of the plating group.Putti AB et al[13] compared functional outcomes, union and complication rates in patients treated with locked intramedullary nailing or dynamic compression plating for humeral shaft fractures. 32 men and 2 women with humeral shaft fractures were randomised to undergo locked antegrade intramedullary nailing (IMN, n=16) or dynamic compression plating (DCP, n=18). Patients with pathological fractures, grade-III open fractures, neurovascular injury, or fractures for more than 2 weeks were excluded. Fractures were classified according to the AO classification system (one in A1, 6 in A2, 12 in A3, 6 in B1, and 9 in B2). 28 were injured in road traffic accidents. The functional outcome (according to the American Shoulder and Elbow Surgeons [ASES] score) and rates of union and complication of the 2 groups were compared. All patients were followed up for a minimum of 24 months. In the respective IMN and DCP groups, the mean ASES scores were 45.2 and 45.1 (p=0.69), the complication rates were 50% and 17% (p=0.038), and the non-union rates were 0% and 6% (p=0.15). In the IMN group, 2 sustained iatrogenic fractures during nail insertion; 2 had transient radial nerve palsies; one underwent nail removal for shoulder impingement; and 3 had adhesive capsulitis. In the DCP group, one underwent re-operation for implant failure; one had a superficial infection; and one developed adhesive capsulitis. The complication rate was higher in the IMN group, whereas functional outcomes were good with both modalities.[13]

In the present study, among patients of the nailing group, excellent, good, fair and poor results were seen in 22 percent, 42 percent, 24 percent and 12 percent of the patients respectively. Among the patients of the plating group, excellent, good, fair and poor results were seen in 26 percent, 66 percent, 2 percent and 6 percent of the patients respectively. Results were significantly better among the patients of the plating group.Singisetti, K et al, analysed twenty patients of interlocking nailing and sixteen patients of plating after considering the inclusion and exclusion criteria. Functional scoring criteria were used for postoperative assessment and the average follow-up period was one year. A higher rate of excellent and good results and a tendency for earlier union was seen with the plating group in their series.[14]

CONCLUSION

Plating yielded superior outcomes in the management of closed humeral shaft fractures as compared to the utilization of interlocking nails.

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