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Evaluation of Upper Extremity Function after Operative and Non-Operative Management of Proximal Humeral Fracture Patients at Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia

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A B S T R A C T

Introduction: Proximal humeral fractures are one of the most common long bone fractures due to osteoporosis. The need for operative action can provide greater benefits than non-operative measures. However, the difference between the need for operative and non-operative measures in proximal fractures is still controversial. This study aimed to determine differences in DASH (disability of the arm, shoulder, and hand) scores as a function of assessing upper extremity patients with proximal humeral fractures after operative and non-operative management at Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia. **Methods:** Cross-sectional analytic observational study, in which 37 research subjects participated in this study. Univariate and bivariate analyses were carried out using SPSS software on the patient's sociodemographic data as well as the clinical data of the study subjects. **Results:** There was no statistically significant difference in upper extremity function (DASH score) between operative and non-operative procedures in patients with proximal humeral fractures, p> 0.05. **Conclusion:** There was no difference in upper extremity function as assessed by the DASH score in operative and non-operative procedures in patients with proximal humeral fractures at Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia.

1. Introduction

Proximal humeral fractures are one of the most common long bone fractures due to osteoporosis. Impaired bone quality increases the risk of penetration screwing the bad one, delayed union, as well as instability. Approximately 85% of proximal humeral fractures are undisplaced or displaced and can be managed conservatively at least, whereas about 15% of fractures are displaced is a challenge for surgeons who are given operative or non-operative management. Operative measures for proximal fractures are growing along with advances in techniques and implants for fracture fixation, including internal fixation and replacement of the humeral head, while non-operative measures include immobilization using an arm sling.[1-5]

The management of proximal humeral fractures based on Neer's classification depends on the involvement of the four anatomic segments of the proximal humerus that fracture or displaced, including the shoulder head, shaft, greater tubercle, and lesser tubercle. The majority of proximal humeral

fractures are related to trauma low-energy. 77-84% of cases include displaced minimal or 2-part fractures. Meanwhile, comminuted fracture and displacement, especially fractures 3 and 4 parts, is a potential indication for surgery. The need for operative action can provide greater benefits than non-operative measures. However, the difference between the need for operative and non-operative measures in proximal fractures is still controversial. Clinicians need to determine the need for operative and non-operative measures in patients related to differences in upper extremity function, complications, and prognosis.[6-10] This study aimed to determine differences in DASH scores (disability of the arm, shoulder, and hand) as functional evaluation of upper extremity patients with proximal humeral fractures after operative and non-operative management at Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia

2. Methods

This study was a cross-sectional analytic observational study and used primary data obtained from research subjects. A total of 37 research subjects were included in this study, and the research subjects met the inclusion criteria. The inclusion criteria were patients with proximal humeral fractures aged more than 18 years who were treated at Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia, and the patient is willing to participate in this study which is characterized by signed informed consent sheets. This study has found agreement with the medical and health research ethics committee at Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia (No. LB.02.03/XVII.5.11/ETIK/09/2023).

This study observed the sociodemographic, clinical data, and DASH scores of the research subjects. The DASH score assesses the ability of the upper limb to function, even if the patient is compensating with another limb. The score consists of reports designed to assess a patient's health status during the previous week. The contents of the DASH score include the degree of difficulty performing different physical activities due to arm, shoulder, and hand disabilities, as well as the severity of symptoms of pain, activity-related pain, tingling, weakness, and stiffness, as well as the impact on social functioning, work, sleep, and self-image. Data analysis was carried out using SPSS version 25 software in univariate and bivariate. Univariate analysis was performed to present the frequency distribution of each variable test. Meanwhile, bivariate analysis was performed to determine differences between operative and non-operative measures on limb function as assessed by the DASH score in patients with proximal humeral fractures, p-value <0.05.

3. Results

Table 1 presents the sociodemographic and clinical frequency distribution of the study subjects. The majority of research subjects are between 19-65 years old. Subject the majority of studies have female gender. The majority of research subjects experienced 2-part fractures, and the majority were treated with surgery.

Table 2 presents a comparison of the functions of extremities after operative or non-operative action in patients with proximal humeral fractures. The results of the study showed that there was no statistically significant difference regarding upper extremity function (DASH score) between operative and non-operative measures in patients with proximal humeral fractures, p> 0.05.

4. Discussion

In the results of this study, there were insignificant differences in upper extremity function between DASH scores between postoperative and non-operative patients. This is in line with several previous studies in which 409 patients with proximal humeral fractures classified as Neer 3 and 4 parts did not have a significant difference in the quality of life postoperatively or non-operatively.[11,12] Another study showed that there were no post-treatment functional differences in the samples.[13]

Table 1. Distribution of proximal humeral fracture patients based on age, gender, Neer classification, and management.

Variable	Total	Percentage (%)
Age		
19-65 years	26	70,3
>65 years	11	29,7
Gender		
Male	13	35,1
Female	24	64,9
Neer classification		
1-part fracture	3	8,1
2-part fracture	16	43,2
3-part fracture	8	21,6
4-part fracture	7	18,9
Dislocation fracture	3	8,1
Management		
Operative	19	51,4
ORIF	15	40,5
Hemiarthroplasty	4	10,8
Non-operative	18	48,6

Table 2. Comparison of management operative and non-operative based on upper extremity function in proximal humeral fracture patients.

DASH scores	Management			p-value*
	Operative n (%)	Non-operative n (%)	Total n (%)	
0 - 15	10 (50,0)	10 (50,0)	20 (100,0)	1,000
16 - 100	9 (52,9)	8 (47,1)	17 (100,0)	
Total	19 (51,4)	18 (48,6)	37 (100,0)	

*Chi-square.

Another study stated that in patients over 60 years of age who experienced proximal humeral fractures with the Neer 2-part classification, there was no significant difference in clinical outcomes after operative and non-operative treatment.[14,15] Another study showed that there were no significant differences in clinical outcomes and postoperative quality of life between operative and non-operative measures.[16] Studies show the same results as patients with postoperative proximal humeral fracture follow-up for 2 years did not give better outcomes than post-operative non-operative management.[17] Another study that assessed the functional outcome of these fracture patients after operative and non-operative treatment with a DASH score showed no significant difference between the two treatment options. The results of this study are in line with other studies which state that in cases of proximal humerus fractures with intact periosteum –greater tuberosity -rotator cuff (P-GT-RC) and dislocated humeral head which has been reduced, so there will be faster healing than other cases.[18] In addition, the stability of the fracture fragments and perfusion of the periosteum will be optimal due to the hematoma inside the glenohumeral joint capsule. So the selection of non-operative therapy in certain cases of proximal humerus fractures can provide outcomes that are as good as operative management.[19]

5. Conclusion

There was no difference in upper extremity function as assessed by the DASH score in operative and non-operative procedures in patients with proximal humeral fractures at Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia.

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