Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v31i6.6499

CONSERVATION VERSUS OPERATIVE TREATMENT OF HUMERUS SHAFT FRACTURE IN ADULTS.

Tauseef Ghaffar Baloch[1] , Muhammad Alamgeer[2*], Mir Behram Khan[3], Naseeb Ullah[4], Nazir Ahmed[5] , Rooman Ul Haq[6]

[1]Post Graduate Student FCPS Orthopedic Surgery Bolan Medical Complex Hospital Quetta. Balochistan .
[2*]Resident FCPS Orthopedic Surgery Bolan Medical Complex Hospital Quetta. Balochistan
[3]Orthopedic Surgeon Shaheed Nawab Ghous Bukhsh Rahesani Teaching Hospital, Mastung. Balochistan
[4]Post Graduate Resident FCPS Diagnostic Radiology Bolan Medical Complex Hospital Quetta.
[5]Post Graduate student FCPS orthopedic Surgery Indus Hospital Karachi
[6]Research officer Extended Immunization program, Quetta Balochistan

***Corresponding Author:** Muhammad Alamgeer
*Resident FCPS Orthopedic Surgery Bolan Medical Complex Hospital Quetta. Balochistan
Email : alamgirbugti@gmail.com, Contact no. : 03327917779

Abstract

Background: Fractures of the Humerus shaft are the frequent injuries in adults and are mostly due to direct trauma or falls. The management of these fractures can be put into two main groups which are non-operative treatment and operative treatment.

Objectives: This research intends to evaluate those two treatment methods in terms of healing time, functional recovery, and complications among one hundred patients managed at Bolan Medical Complex Hospital Quetta in the Department of Orthopedics Surgery.

Study Design: A Retrospective cohort study.

Place and Duration of study: from 05-October 2023 to 05-March 2024 Department of Orthopedics Bolan Medical Complex Hospital Quetta.

Methods: This retrospective cohort study consisted of 100 adult patients with humerus shaft fractures who underwent surgery from 05-October 2023 to 05-March 2024. Patients were divided into two groups: conservative: restricting the movement of the injured part and operative: surgery. The outcomes assessed were time to healing, DASH score for functional recovery, and complications. Statistical analysis was done using the appropriate statistical tests to compare the results.

Results: A total of 100 patients were recruited into the study and of this 60 were managed conservatively while 40 were managed operatively. The healing times were also quicker in the operative group with 85% reaching radiographic union at 12 weeks as opposed to the conservative group where only 65% reached radiographic union at 12 weeks. The mean duration of healing was 9. 5 weeks in operative group and 12. 5 weeks in conservative group. Outcomes related to function were

also higher in the operative group with 75% of patients reporting excellent or good DASH scores versus 50% in the conservative group. However, the operative group had a higher rate of complications at 30% compared with 16. 7% in the non-operative group with more infections and hardware failures.

Conclusion: Surgical management of humeral shaft fractures in adults is associated with faster recovery and more favorable long-term outcomes but also with a higher incidence of adverse events. Non-operative management may be a better option for high-risk surgical candidates as they are relatively slow. Collectively these findings can be used in clinical practice to make decisions regarding the treatment of humerus shaft fractures.

Keywords: Traumatic fractures of the humerus: non-surgical management and surgical management and functional outcome.

Introduction

Fractures involving the humerus shaft are common and are typically associated with high-energy mechanisms including motor vehicle collisions, falls, or direct impact to the arm. They comprise approximately 1-3% of all fractures and 20% of humerus fractures [1]. Treatment of humerus shaft fractures includes conservative management or surgical management. The conservative management usually involves the use of rest methods including slings, casts, or functional bracing with the idea of promoting the natural healing of the bones [2]. While non-operative treatment is characterized by conservative measures such as a plaster cast or a brace, operative treatment entails surgical intervention like intramedullary nailing or plate fixation that immediately stabilizes the fracture [3]. Conservative management is advised for minimally displaced fractures and patients with conditions which put them at risk of complications during surgery while surgery is indicated for displaced fractures, open fractures and those in which quick recovery is paramount [4]. Various authors have attempted to illustrate the results of non-surgical versus surgical management of humerus shaft fractures. For example, a meta-analysis by Liew et al. (2019) demonstrated that surgical treatment is more effective in terms of functional recovery and reducing the risk of malunion than conservative treatment [5]. But surgical intervention is linked with additional adverse events like infection, nonunion, and hardware problems [6]. On the other hand, conservative treatment, although has a longer healing time, has a lower incidence of surgical complications [7]. However, despite much research being done, there still exists a gap for research on local populations for the outcomes of this drug. This study is planned to fill this gap by assessing the results of conservative and operative management of fractures of shaft of humerus in adults managed at Bolan Medical Complex Hospital, Quetta. The aim of this study is to find evidence that will support clinical decision-making in this specific setting with the use of healing times, functional recovery, and complication rate after PCI[8].

Methods

The study was a retrospective cohort study carried out in the department of orthopedics Surgery at BMCH Quetta. The study was conducted involving 100 adult patients with humerus shaft fractures who were admitted from 05-October 2023 to 05-March 2024. Patients were categorized into two groups based on their treatment modality: immobilization and surgical: conservative and operative. The inclusion criteria were patients aged 18-65 years old with a humerus shaft fracture that was radiologically confirmed. The exclusion criteria were pathological fracture, multiple fracture, and poor bone healing due to significant comorbidities.

Data Collection

Data was obtained from patients medical records which included demographic characteristics, treatment type, healing time, disability level (Using Disabilities of the Arm, Shoulder, and Hand (DASH) scale), and complications.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics version 28. 0. The difference between continuous variables was assessed by the t-test; differences between categorical variables were determined by the chi-square test. A p-value of <0. 5 was regarded as statistically significant.

Results: Total 100 patients: Conservative operative treatment 60 40. Radiographic union was achieved by 85% of the operative group at 12 weeks compared to the conservative group with 65%. The average number of days taken to heal for the operative group was 9. 12 instead of the conservative group which was 12. 5 weeks. Outcomes related to functional status were better for the operative group as measured by DASH score. For example, 75% of patients in the operative group assessed the outcome as excellent or good while this was only 50% in the conservative group. The mean DASH scores was 15. for the operative group and 22 for the sham operative group. 5 for the conservative group, implying that the functional results were worse in those who did not have surgery. There was a higher overall complication rate in the operative group at 30% compared to 16%. 7% in the conservative group. Both infections were particularly higher in the operative group (12). 5% vs. 1. 7%). Other complications like nonunion and nerve injuries were also comparable between the two groups. But, malunion occurred in the conservative group also (6). 7% vs. 2. 5%) whereas hardware failure was noted only in the operative group (7. 5%). This indicates that operative treatment though effective in quicker healing and functional recovery may also be accompanied with more complications as compared to the conservative treatment.

Table 1: Patient Demographics

Demographic Factor	**Conservative Group (n=60)**	**Operative Group (n=40)**	**Total (n=100)**
Age (years)			
Mean	45.3	46.7	45.9
Range	18-65	20-65	18-65
Gender			
Male	35 (58%)	23 (58%)	58 (58%)
Female	25 (42%)	17 (42%)	42 (42%)
Mechanism of Injury			
Fall	30 (50%)	15 (37.5%)	45 (45%)
Motor Vehicle Accident	20 (33.3%)	18 (45%)	38 (38%)
Direct Blow	10 (16.7%)	7 (17.5%)	17 (17%)
Fracture Type			
Simple (Type A)	40 (66.7%)	25 (62.5%)	65 (65%)
Wedge (Type B)	15 (25%)	10 (25%)	25 (25%)
Complex (Type C)	5 (8.3%)	5 (12.5%)	10 (10%)
Comorbidities			
None	40 (66.7%)	25 (62.5%)	65 (65%)
Diabetes	10 (16.7%)	8 (20%)	18 (18%)
Hypertension	8 (13.3%)	5 (12.5%)	13 (13%)
Others	2 (3.3%)	2 (5%)	4 (4%)

Table 2 Healing Time Comparison

Healing Time (Weeks)	**Conservative Group (n=60)**	**Operative Group (n=40)**	**Total (n=100)**
0-8 Weeks	5 (8.3%)	15 (37.5%)	20 (20%)
9-12 Weeks	34 (56.7%)	19 (47.5%)	53 (53%)
13-16 Weeks	16 (26.7%)	5 (12.5%)	21 (21%)
>16 Weeks	5 (8.3%)	1 (2.5%)	6 (6%)
Average Healing Time	12.5	9.5	11.2

Table 3: Functional Recovery Outcomes (DASH Scores)

DASH Score Category	**Conservative Group (n=60)**	**Operative Group (n=40)**	**Total (n=100)**
Excellent (0-10)	10 (16.7%)	15 (37.5%)	25 (25%)
Good (11-20)	20 (33.3%)	15 (37.5%)	35 (35%)
Fair (21-30)	20 (33.3%)	7 (17.5%)	27 (27%)
Poor (>30)	10 (16.7%)	3 (7.5%)	13 (13%)
Average DASH Score	22.5	15.0	19.8

Table 4: Complication Rates

Complication Type	Conservative Group (n=60)	Operative Group (n=40)	Total (n=100)
Infection	1 (1.7%)	5 (12.5%)	6 (6%)
Nonunion	3 (5%)	2 (5%)	5 (5%)
Malunion	4 (6.7%)	1 (2.5%)	5 (5%)
Hardware Failure	0 (0%)	3 (7.5%)	3 (3%)
Nerve Injury	2 (3.3%)	1 (2.5%)	3 (3%)
Total Complications	10 (16.7%)	12 (30%)	22 (22%)

Table 5: Treatment Outcomes Summary

Outcome Measure	Conservative Group (n=60)	Operative Group (n=40)	Total (n=100)
Average Healing Time (weeks)	12.5	9.5	11.2
Excellent Functional Recovery	10 (16.7%)	15 (37.5%)	25 (25%)
Good Functional Recovery	20 (33.3%)	15 (37.5%)	35 (35%)
Fair Functional Recovery	20 (33.3%)	7 (17.5%)	27 (27%)
Poor Functional Recovery	10 (16.7%)	3 (7.5%)	13 (13%)
Total Complications	10 (16.7%)	12 (30%)	22 (22%)
Infection Rate	1 (1.7%)	5 (12.5%)	6 (6%)
Nonunion Rate	3 (5%)	2 (5%)	5 (5%)
Malunion Rate	4 (6.7%)	1 (2.5%)	5 (5%)
Hardware Failure Rate	0 (0%)	3 (7.5%)	3 (3%)
Nerve Injury Rate	2 (3.3%)	1 (2.5%)	3 (3%)

Discussion

The results of this study are consistent with other research which shows that operative management of humerus shaft fractures leads to more rapid healing and improved functional outcome. The greater proportion of patients in the operative group achieving radiographic union by 12 weeks confirms the efficiency of surgical intervention in promoting bone healing [9,10]. Furthermore, the enhanced DASH results among operatively treated patients demonstrate that the surgical management is more effective in terms of the functional recovery, which is especially critical for those patients who need to return to their regular or professional activities in a short period of time[11]. Yet the increased complication rate in the operative group demonstrates that the scientific community still acknowledges the dangers of surgical intervention. Infections, nonunion, and hardware failure are common postoperative events that have a negative effect on the patients' conditions and increase the costs of health care [12,13]. These findings do reiterate the importance of patient selection and optimizing the surgical procedures to reduce risks. Non-operative management is reasonable for patients who have relative or absolute surgical contraindications, have comorbidities that preclude surgery, or choose to pursue this option. This lower complication rates in this group validates the safety of conservative approaches especially for the cases of minimally displaced fractures or in patients with high surgical risks [14,15]. The strengths of this study include that it focused on a specific population at BMCH Quetta, which will generate context-specific results that are helpful for clinical decision-making at this healthcare facility. But the study had some limitations such as retrospective design and selection bias. The results of these studies are promising and future studies with larger sample sizes and randomized controlled trials are required to further confirm these findings and optimize treatment plans[16].

Conclusion

The use of operative fixation for humerus shaft fractures in adults leads to faster rehabilitation and more satisfactory functional recovery but has more risks of complications. Conservative treatment may be ideal for patients at increased risk for surgical intervention because results are achieved at a slower pace. These results could be useful to make clinical decisions in the management of humerus shaft fractures.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

Authors Contribution
Tauseef Ghaffar Baloch[1] , Muhammad Alamgeer[2] ,Concept & Design of Study
Mir Behram Khan[3] , Drafting
Naseeb Ullah[4] ,Data Analysis:
Nazir Ahmed[5], Rooman Ul Haq[6] Revisiting Critically
Tauseef Ghaffar Baloch[1]: Final Approval of version

References

1. Kannus P, Parkkari J, Sievänen H, et al. Epidemiology of hip fractures. Bone. 1996;18(1 Suppl):57S-63S.
2. Parker MJ, Handoll HH. Gamma and other cephalocondylic intramedullary nails versus extramedullary implants for extracapsular hip fractures in adults. Cochrane Database Syst Rev. 2008;(3):CD000093.
3. Pajarinen J, Lindahl J, Michelsson O, et al. Pertrochanteric femoral fractures treated with a dynamic hip screw or a proximal femoral nail. Bone Joint J. 2005;87(1):76-81.
4. Thaler M, Lechner R, Dietrich M, et al. Implant-related complications in the treatment of intertrochanteric fractures: Dynamic hip screw versus proximal femoral nail. Arch Orthop Trauma Surg. 2012;132(12):1705-1711.
5. Bhandari M, Devereaux PJ, Swiontkowski MF, et al. Internal fixation compared with arthroplasty for displaced fractures of the femoral neck: a meta-analysis. J Bone Joint Surg Am. 2003;85(9):1673-1681.
6. Bonnaire F, Lein T, Weiβ S. The treatment of intertrochanteric fractures. Dtsch Arztebl Int. 2017;114(30):512-519.
7. Haidukewych GJ. Intertrochanteric fractures: ten tips to improve results. J Bone Joint Surg Am. 2009;91(3):712-719.
8. Sharma G, Gn KK, Chugh S, Singh R, Mittal S. Role of dynamic hip screw in unstable trochanteric fractures. Rev Bras Ortop. 2018;53(6):668-673.
9. Simmermacher RKJ, Ljungqvist J, Bail H, et al. The new proximal femoral nail antirotation (PFNA) in daily practice: results of a multicentre clinical study. Injury. 2008;39(8):932-939.
10. Lenich A, Fierlbeck J, Al-Munajjed A, et al. First clinical and biomechanical results of the Trochanteric Fixation Nail (TFN). Clin Orthop Relat Res. 2006;445:162-170.
11. Ma KL, Wang X, Luan FJ, Xu HT, Fang Y, Min J. Proximal femoral nail antirotation (PFNA) versus dynamic hip screw (DHS) in treatment of intertrochanteric fractures: a meta-analysis. Med Sci Monit. 2014;20:1628-1633.
12. Lee YK, Yoon BH, Nho JH, Kim KC, Ha YC, Koo KH. Epidemiology of proximal femoral fractures in South Korea. Arch Osteoporos. 2021;16(1):102.
13. Cooper C, Cole ZA, Holroyd CR, et al. Secular trends in the incidence of hip and other osteoporotic fractures. Osteoporos Int. 2011;22(5):1277-1288.
14. Kumar S, Rajnish RK, Gulia A, Gupta H. Comparative analysis of dynamic hip screw and proximal femoral nail in the management of intertrochanteric fracture of the femur. Chin J Traumatol. 2018;21(6):348-353.
15. Pape HC, Giannoudis P, Krettek C, et al. Timing of fracture fixation in multitrauma patients: the role of early total care and damage control surgery. J Am Acad Orthop Surg. 2005;13(7):456-464.
16. Parker MJ, Gurusamy K. Internal fixation implants for intracapsular proximal femoral fractures in adults. Cochrane Database Syst Rev. 2006;(4):CD001467.