



Original Article

3-Part and 4-Part Proximal Humerus Fractures Among Elderly Due to Osteoporosis: Pain Assessment

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ABSTRACT

The occurrence of osteoporotic PHFs is rising due to people getting older, and it will increase by threefold in the 30 years to come. PHFs are twice as prevalent in women compared to males. Most of these fractures are neither displaced or angulated, and 89.1% can be treated conservatively. While these fractures are frequently encountered, their treatment is both costly and intricate. However, there is a limited amount of research that has been conducted on the aforementioned matter. Results from several studies indicate conflicting findings, perhaps attributed to a limited understanding of epidemiology. After receiving appropriate approval and clearance, the patients who met the inclusion criteria were enrolled in the study after obtaining informed consent.

After conservative management, 56.0% (42 individuals) of the study participants reported experiencing "Mild" pain. "Moderate" pain was reported by 30.7% (23 individuals), and 13.3% (10 individuals) experienced "Severe" pain. Out of 75 study participants, 97.3% (73 individuals) experienced pain reduction after conservative management.

Keywords: 3-PART AND 4-PART PROXIMAL HUMERUS FRACTURES, OSTEOPOROSIS, Pain Assessment.

INTRODUCTION

Fractures in the senior population, particularly those caused by osteoporosis, have emerged as a significant public health concern in recent years. The present population exhibits a significant incidence of proximal humeral fractures (PHFs) due to increased life expectancies and the consequent surge in osteoporotic fractures in their bones. These fractures rank fourth in terms of prevalence among the elderly population. These studies also provide an estimation of the occurrence rate, ranging from 9 to 22 cases per 1000 individuals each year. The occurrence of osteoporotic PHFs is rising due to people getting older, and it will increase by threefold in the 30 years to come. PHFs are twice as prevalent in women compared to males. Most of these fractures are neither displaced or angulated, and 89.1% can be treated conservatively.¹

While these fractures are frequently encountered, their treatment is both costly and intricate. However, there is a limited amount of research that has been conducted on the aforementioned matter. Results from several studies indicate conflicting findings, perhaps attributed to a limited understanding of epidemiology.²

While several articles exist on different surgical approaches for managing these fractures, there is a scarcity of literature focusing on alternative therapies. This is noteworthy because traditional therapy is the preferred option for many patients, especially those with minimally displaced fractures that can be effectively maintained without surgery. In addition, despite the elevated incidence of problems associated with operations for these injuries, advancements in osteosynthesis and prosthetic replacement procedures have expanded the indications for surgical treatment of displaced proximal humeral fractures.^{3,4}

METHODOLOGY

STUDY DESIGN:

An observational analytical study

STUDY AREA:

The research study included individuals who were diagnosed with a proximal humerus fracture and were taken to the orthopaedics department.

STUDY PERIOD AND DURATION:

The research was conducted over a period of one year and four months

STUDY POPULATION:

Male and female patients with 3-part and 4-part proximal humerus fractures who meet the specified criteria and are admitted to the Department of Orthopaedics

SAMPLE SIZE CALCULATION

In 2016, Corley et al conducted a study which revealed that the occurrence rate of proximal humerus fracture was five percent. [23]

Formula:

$$N = 4 * p * q / d^2$$

Where,

P = prevalence

Q = compliment of p

D = absolute error (which is 5 percent) N = 75

Therefore, a minimum sample size of 75 was necessary to achieve a 95 percent confidence interval. The sample size was determined using nMaster software Version 2.0 by inputting the specified parameters into the formula mentioned above.

INCLUSION CRITERIA:

- All patients with 3-part and 4-part proximal humerus fracture
- Both gender of age more than 60 years
- Patients within minimum of one year duration from the period of study.

EXCLUSION CRITERIA:

- Patients with pathological fracture
- Patients underwent surgical treatment
- Patients with open fracture
- Patients with cognitive dysfunction
- Patients had a history of stroke and hemiplegia.

SAMPLING METHOD

All consecutive patients diagnosed with 3-part and 4-part proximal humerus fracture between August 2022 and January 2024, who were hospitalized to the Orthopaedics department at the Tertiary Care Hospital in Bangalore, and had identical symptoms.

DATA COLLECTION PROCEDURE

After receiving appropriate approval and clearance, the patients who met the inclusion criteria were enrolled in the study after obtaining informed consent.

Upon admission, demographic data, historical information, clinical examination findings, and investigation details were documented in the research proforma.

All patients who visited the orthopaedic department throughout the study period and were scheduled for conservative treatment were included in the study. The patients were presented with shoulder exercises, physiotherapy, and treated with analgesics.

All routine investigations were sent and collected. Radiological investigations like chest x-ray , shoulder xray etc were carried out. Then all the patients were followed up after 6 months.

Assessed for functional and radiological outcome

Assessment of pain relief was done using VAS scoring

RESULTS

Table 1: Distribution of the study participants according to their pain before conservative management assesses by VAS score (n = 75)

Pain before conservative management assesses by VAS score		Frequency	Percent
	Moderate	2	2.7
	Severe	15	20.0
	Very severe	58	77.3
	Total	75	100.0

Before conservative management, as assessed by the VAS score, 77.3% (58 individuals) of the 75 study participants reported experiencing "Very severe" pain. "Severe" pain was reported by 20.0% (15 individuals), and only 2.7% (2 individuals) experienced "Moderate" pain. This indicates that the majority of participants experienced very severe pain.

Table 2: Distribution of the study participants according to their pain after conservative management assesses by VAS score (n = 75)

Pain after conservative management assesses by VAS score		Frequency	Percent
	Mild	42	56.0
	Moderate	23	30.7
	Severe	10	13.3
	Total	75	100.0

After conservative management, assessed by the VAS score, 56.0% (42 individuals) of the 75 study participants reported experiencing "Mild" pain. "Moderate" pain was reported by 30.7% (23 individuals), and 13.3% (10 individuals) experienced "Severe" pain. This indicates an overall improvement in pain levels following conservative management.

Table 3: Distribution of the study participants according to their pain reduction before and after conservative management assesses by VAS score (n= 75)

Pain reduction		Frequency	Percent
	No	2	2.7
	Yes	73	97.3
	Total	75	100.0

Out of 75 study participants, 97.3% (73 individuals) experienced pain reduction after conservative management, while 2.7% (2 individuals) did not. This indicates that nearly all participants saw an improvement in their pain levels following the treatment.

DISCUSSION

Patients' chronological and physiological ages inform the proximal humerus treatment protocol. While older patients may find relief from a variety of treatments, including nonoperative methods and prosthetic replacement, younger patients are treated more aggressively with osteosynthesis, which makes every effort to restore normal anatomy.⁵

The non-invasive method usually entails immobilization with a sling and subsequent physical therapy. A variety of immobilization options are available, such as a cuff and collar, a normal sling, a hanging arm cast, a shoulder spica cast, or an airplane splint; however, the last two are mostly antiquated and no longer used in clinical practice. In contrast to humeral shaft fractures, partial clavicle fractures (PHFs) do not respond well to functional bracing because the external forces acting on the fracture pieces from the rotator cuff are insufficient to prevent deformation.⁶ Improved functional outcomes for patients have been associated with physiotherapy initiation within 14 days after injury. When it comes to

more displaced fractures in the elderly, the evidence implies that there might not be a noticeable distinction in functional result between PHFs treated surgically and non operatively. Outcomes were favourable or excellent for 80.6% of 125 patients managed without surgery for valgus impacted PHFs. Contrarily, functional outcomes for non-operative therapy of PHFs were found to be poor in multiple studies, and they were even lower when compared to surgical management.⁷

Osteonecrosis, hypounion, stiffness, malunion, and rotator cuff dysfunction are complications that might arise with nonoperative treatment. Seven percent of the 160 patients with proximal humeral fractures who did not undergo surgical treatment exhibited either delayed union or non-union, according to Hanson et al. More frequent stiffness during nonoperative treatment is associated with complete immobilization for longer than two weeks following injury.⁸

CONCLUSION

Before conservative management, as assessed by the VAS score, 77.3% (58 individuals) of the 75 study participants reported experiencing "Very severe" pain. After conservative management, 56.0% (42 individuals) of the study participants reported experiencing "Mild" pain. "Moderate" pain was reported by 30.7% (23 individuals), and 13.3% (10 individuals) experienced "Severe" pain. Out of 75 study participants, 97.3% (73 individuals) experienced pain reduction after conservative management.

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