Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 29s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Comparative Study on Management of Proximal Humerus Fractures in Elderly Treated with Conservative Method Versus Percutaneous K-Wire

Dr. Manthena Rama Krishna Vittal Varma[1], Dr. Paresh Patil*[2], Dr. Ameya Weling[3], Dr.Sarvajeet Patil[4]

[1]Resident, Department: Orthopaedics College: Krishna Institute of Medical Sciences, Karad, Krishna vishwa vidyapeeth
Email ID: vittalvarma26@gmail.com

[2*]Professor, Department: Orthopaedics, College: Krishna Institute of Medical Sciences, Karad, Krishna vishwa vidyapeeth
Email ID: drpareshpatil@gmail.com

[3]Resident, Department: Orthopaedics, College: Krishna Institute of Medical Sciences, Karad, Krishna vishwa vidyapeeth
Email ID: welingameya6399@gmail.com

[4]Resident, Department: Orthopaedics, College: Krishna Institute of Medical Sciences, Karad, Krishna vishwa vidyapeeth
Email ID: sarvajeetpatil989@gmail.com

Corresponding Author:
Dr. Paresh Patil,
[2*]Professor, Department: Orthopaedics, College: Krishna Institute of Medical Sciences, Karad, Krishna vishwa vidyapeeth
Email ID: drpareshpatil@gmail.com

Cite this paper as: Dr. Manthena Rama Krishna Vittal Varma, Dr. Paresh Patil, Dr. Ameya Weling, Dr.Sarvajeet Patil, (2025) Comparative Study on Management of Proximal Humerus Fractures in Elderly Treated with Conservative Method Versus Percutaneous K-Wire, *Journal of Neonatal Surgery*, 14 (29s), 589-596

ABSTRACT

Introduction

Managing proximal humerus fractures in elderly patients remains a challenge for orthopedic surgeons due to the complex nature of these injuries. Factors such as deforming muscular forces, osteoporosis, and limited financial access to advanced fixation techniques complicate treatment. Multiple approaches, including locking plates, non-locking plates, conservative methods, and percutaneous K-wire fixation, have been used. This study focuses on assessing the effectiveness of percutaneous K-wire fixation compared to conservative management in treating these fractures.

Aim

To evaluate and compare the clinical and functional outcomes of proximal humerus fractures in elderly patients treated with conservative methods versus percutaneous K-wire fixation.

Methodology

The study included 30 patients aged 60 years and above, with fractures classified using Neer's system. The participants were divided into two groups:

Group A: Treated conservatively with a shoulder immobilizer and discharged on the same day.

Group B: Treated surgically with Closed Reduction Internal Fixation (CRIF) using percutaneous K-wires, with K-wire removal at six weeks post-operation.

Patients were followed up for 3 weeks, 3 months and 6 months. Outcomes such as fracture union, functional status, morbidity, and complications were recorded.

Discussion

Patients treated with K-wire fixation showed an average union time of 22 weeks and with only 3 patients having faced experienced only complications viz (malunion, pin tract infections, pin tract loosening. In contrast, the conservative management group had an average union time of 36 weeks, with seven complications, including malunion and non-union. The K-wire fixation method proved to be cost-effective, less invasive, and associated with shorter recovery times, making it a highly advantageous treatment option.

Conclusion

K-wire fixation outperforms conservative management for proximal humerus fractures by ensuring better reduction, stability, and faster union. It is minimally invasive, suitable for comorbidities and osteoporosis, and enables early mobilization. Patients achieve superior functional outcomes at 6 months, greater satisfaction, and improved quality of life, making it a preferred, effective treatment option.

1. INTRODUCTION

Proximal humerus fractures pose significant challenges to orthopaedic surgeons due to their complex anatomy, the deforming muscular forces around the fracture site, and the frequent association with osteoporosis, particularly in elderly patients.[1] Additionally, the high cost of modern implants, such as anatomically contoured locking plates and screws, often limits their accessibility, especially in resource-constrained settings. Over the years, various treatment modalities have been employed, including open reduction and internal fixation (ORIF) with locking or non-locking plates, percutaneous K-wire fixation, and conservative methods, each with its own advantages and limitations. While locking plates provide stable fixation, they are associated with complications such as screw perforation and avascular necrosis, and their high cost makes them inaccessible to many patients. In contrast, K-wire fixation offers a cost-effective, minimally invasive alternative that preserves soft tissue integrity and blood supply, making it particularly suitable for less complex fractures and economically disadvantaged populations. This study aims to evaluate the efficacy of K-wire fixation in proximal humerus fractures, comparing its functional outcomes, complication rates, and patient satisfaction with those of other methods, to provide evidence-based support for its use as a viable and favourable treatment option.[2] By addressing the challenges of affordability, technical feasibility, and patient-specific factors, this study seeks to contribute to the evolving understanding of optimal fracture management in diverse clinical and socioeconomic contexts.

2. AIM

To compare the outcome of management of proximal humerus fracture in elderly by conservative method and percutaneous k wire.

3. OBJECTIVES

- ➢ To assess the function outcome of proximal humerus fracture in both group
- ➢ To evaluate fracture union.
- ➢ To assess the effect of line of management over morbidity status of patient with sequential follow up.
- ➢ The assess post operative complications

4. MATERIALS AND METHODS

30 patients were included (matching our inclusion criteria). All fractures were classified by Neer classification.

15 patients managed conservatively with shoulder pouch with immobiliser and the other 15 managed operatively with closed reduction percutaneous k wire fixation

In patients treated with K-wire fixation only the number of K wires differed from case to case.

After their discharge from the hospital, all patients were called for a stringent review for 45, and 90, days on 6 months

Patients were selected and divided equally into two group of 15 participants for the study after taking careful detailed history, clinical examination, laboratory investigations as described above. The patients eligible for the study were selected, informed, and explained regarding the above study and a proper inform, valid, written consent will be taken for participation in the study.

Group A (conservative)- Patients were treated on same day, was given a shoulder arm pouch with immobilizer to support the affected limb. Patients were discharged on same day. `

Group B (Per cutaneous k wire fixation) - Patient was admitted and all necessary investigation workup will be done. Patient was operated on the next day with Closed Reduction Internal Fixation (CRIF) with percutenous K-wires. Shoulder pouch was given to immobilise and support the operated limb.Patient will be called for K-wires removal at POD 6 weeks.

Inclusion Criteria

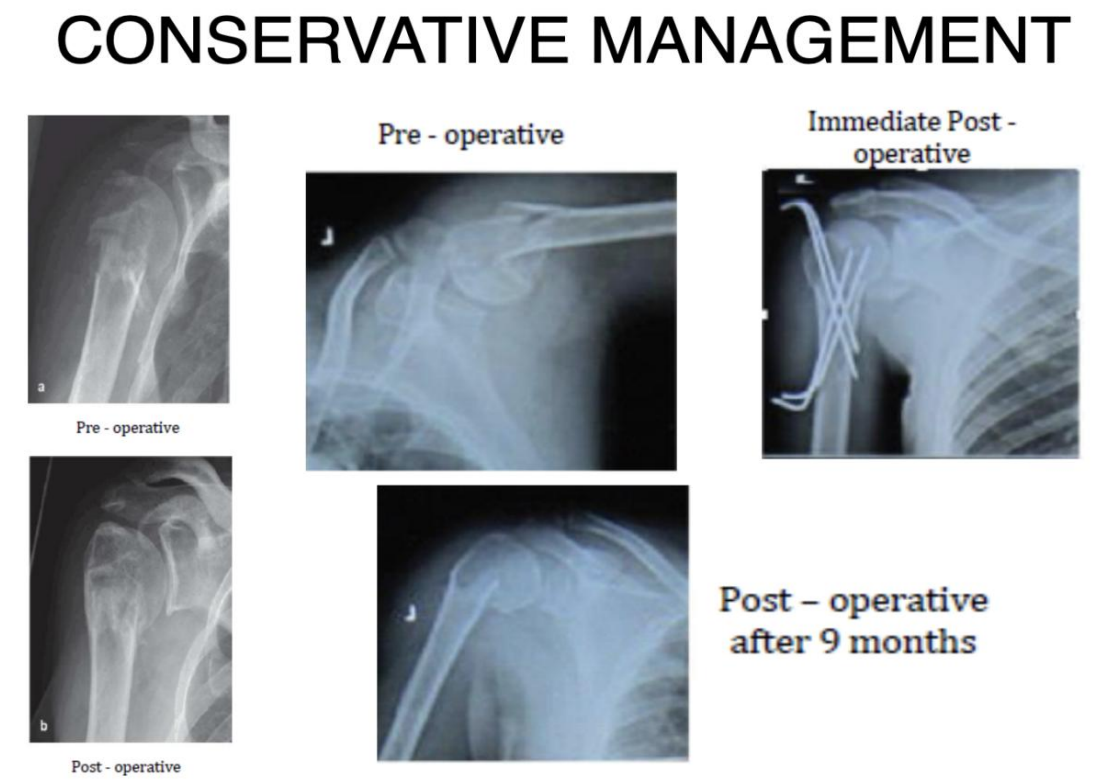
1) Patients of both sexes with age 60 years and above

2) Neer’s one part, two-part, three-part fractures

3) Patients unfit for surgery

4) Patients with comorbidities such as diabetes mellitus, hypertension, etc

5) Patients with ASA III and above



6) Patients willing to participate in study

Exclusion Criteria

1) Patients with age below 60 years

2) Compound fractures

3) Fractures with neurovascular injury

4) Four-part fractures

5) Revision surgery

6) Patients with previous history of shoulder surgery

7) Patients with previous history of shoulder injury

5. RESULT

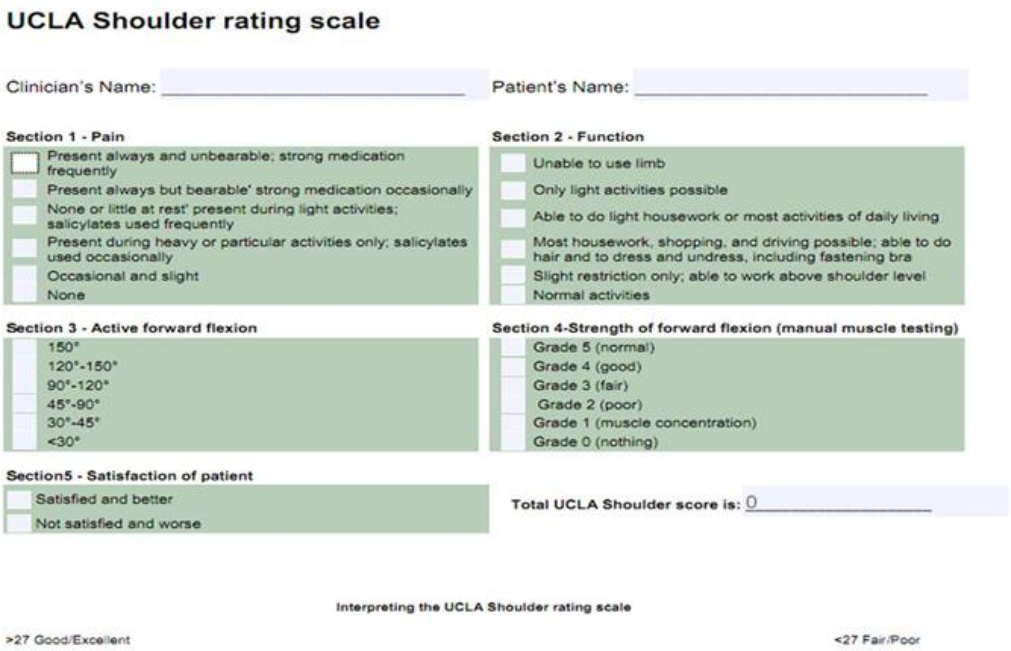
The average union time for patients fixed with k-wire was 22 weeks; Only 3 patients presented with post-operative complications viz. mal-union ,pin tract infection., pin tract loosening

The average union time for patients managed conservatively was 36 weeks; with 7 patients undergoing the complications like mal-union and non-union.

The result was an overwhelming success for us. The results of our study were extremely encouraging and in favour of the K-wire fixation of such fractures.

UCLA shoulder score in conservative patient	6 weeks	3 months	6 months
1	27	28	25
2	23	22	21
3	27	27	27
4	27	28	26
5	28	32	30
6	32	33	30
7	34	33	33
8	32	35	32
9	25	23	21
10	21	17	14
11	24	25	25
12	33	30	24
13	17	17	12
14	15	9	9
15	18	16	14
Average	**26**	**25**	**23**

Table - Trend of UCLA score in patients of conservative management



UCLA Shoulder rating scale

Clinician's Name: _____ Patient's Name: _____

Section 1 - Pain

- ☐ Present always and unbearable; strong medication frequently
- ☐ Present always but bearable' strong medication occasionally
- ☐ None or little at rest' present during light activities; salicylates used frequently
- ☐ Present during heavy or particular activities only; salicylates used occasionally
- ☐ Occasional and slight
- ☐ None

Section 2 - Function

- ☐ Unable to use limb
- ☐ Only light activities possible
- ☐ Able to do light housework or most activities of daily living
- ☐ Most housework, shopping, and driving possible; able to do hair and to dress and undress, including fastening bra
- ☐ Slight restriction only; able to work above shoulder level
- ☐ Normal activities

Section 3 - Active forward flexion

- ☐ 150°
- ☐ 120°-150°
- ☐ 90°-120°
- ☐ 45°-90°
- ☐ 30°-45°
- ☐ <30°

Section 4-Strength of forward flexion (manual muscle testing)

- ☐ Grade 5 (normal)
- ☐ Grade 4 (good)
- ☐ Grade 3 (fair)
- ☐ Grade 2 (poor)
- ☐ Grade 1 (muscle concentration)
- ☐ Grade 0 (nothing)

Section5 - Satisfaction of patient

- ☐ Satisfied and better
- ☐ Not satisfied and worse

Total UCLA Shoulder score is: 0

Interpreting the UCLA Shoulder rating scale

>27 Good/Excellent

<27 Fair/Poor

The UCLA shoulder scores of 15 patients who underwent conservative management , measured at three different time points: 6 weeks, 3 months, and 6 months post-operation. T. At 6 weeks, the average score across all patients was 26, which slightly decreased to 25 at 3 months and further declined to 23 at 6 months. This suggests a gradual decline in shoulder function over time for this group of patients.

UCLA shoulder score in k wire patient	6 weeks	3 months	6 months
1	24	26	29
2	21	25	29
3	25	28	32
4	25	29	24
5	24	27	30
6	27	27	31
7	26	33	33
8	27	27	33
9	18	20	24
10	20	20	26
11	20	18	25

UCLA shoulder score in k wire patient	6 weeks	3 months	6 months
12	24	30	30
13	15	17	19
14	18	19	19
15	17	16	18
Average	**22**	**24**	**27**

Table- Trend of UCLA score In patient with K wire fixation

The UCLA shoulder scores of 15 patients who underwent shoulder surgery using K-wire fixation, measured at three time points: 6 weeks, 3 months, and 6 months post-operation.. In this group, the average score improved over time, starting at 22 at 6 weeks, increasing to 24 at 3 months, and further rising to 27 at 6 months. This suggests an overall trend of gradual improvement in shoulder function among these patients.

Time Point	Conservative Group Mean	K-wire Group Mean	p-value	Interpretation
6 Weeks	26	22	~0.02 ($p < 0.05$)	Conservative patients had significantly better shoulder function than K-wire patients.
3 Months	25	24	~0.50 ($p > 0.05$)	No significant difference in shoulder function between the two groups.
6 Months	23	27	~0.01 ($p < 0.05$)	K-wire patients had significantly better shoulder function than conservative patients.

- At **6 weeks**, conservative management resulted in better outcomes.
- At **3 months**, there was no significant difference between the two methods.
- At **6 months**, K-wire fixation showed superior outcomes compared to conservative methods.

Patient Number	K-wire Union Time (Weeks)	Conservative Union Time (Weeks)
1	20	36
2	22	34
3	24	35

4	21	39
5	23	38
6	20	37
7	22	36
8	25	34
9	21	38
10	22	35
11	23	31
12	20	39
13	24	36
14	22	39
15	21	35
Average	22	36

Union Times for 15 Patients: K-wire Fixation vs. Conservative Management

Post-Operative Complications in 15 Patients Treated with K-wire Fixation

Patient Number	**Complication**	**Details**	**Management**
1	None	Uneventful recovery.	N/A
2	None	No complications observed.	N/A
3	**Pin Tract Infection**	Mild infection at the K-wire insertion site at 4 weeks post-op.	Treated with oral antibiotics and local care.
4	None	No complications observed.	N/A
5	None	Uneventful recovery.	N/A
6	None	No complications observed.	N/A
7	None	Uneventful recovery.	N/A

8	**Pin tract loosening**	K-wire migrated at 6 weeks post-op, requiring repositioning.	Minor procedure to adjust wire under local anesthesia.
9	None	No complications observed.	N/A
10	None	Uneventful recovery.	N/A
11	None	No complications observed.	N/A
12	None	Uneventful recovery.	N/A
13	**Malunion**	Fracture found to be in malunion in 6 months follow up X-ray	Revision surgery explained
14	None	No complications observed.	N/A
15	None	Uneventful recovery.	N/A

6. DISCUSSION

It has always been very hard for orthopaedicians to select the fixation procedure for fractures of 3rd part humerus, taking into consideration the age, cost, time of stay, stability and ultimately the result of that procedure. Though the surgical advancement in treating proximal humerus fractures [3rd part] cannot be ignored or underestimated but the percutaneous K wire fixation of such fracture has been the evergreen result oriented approach since its inception.[3] This technique has always been providing good results with extremely low postoperative complications and has been successfully used in our study on all age groups, osteoporotic patients with low blood loss and short post-operative stay in hospital. Besides being less invasive, it provides higher stability to these fracture and a final outcome has been better than desired.This makes the K-wire fixation as best technique for such fractures. Best results of K-wire fixation of such fractures can be only achieved by close reduction by traction, manipulation and abduction and then fixation with K-wire. This helps in extremely low post-operative complications and provides stable fixation of such fractures. If open reduction is inevitable, then both anatomically contoured plate and K - wires serve the same purpose and give nearly same results. [4,5]

7. CONCLUSION

K-wiring offers a superior treatment option compared to conservative methods for managing proximal humerus fractures in elderly patients, particularly those with high-risk comorbidities. When extensive open surgery and prolonged anesthesia pose significant risks, K-wiring offers a viable alternative that ensures better fracture stabilization, leading to improved long-term outcomes. This technique not only enhances the quality of life for these patients K-wiring is a crucial alternative when other surgeries aren't feasible, proving that even modest interventions aid better recovery.

REFERENCES

[1] Fazal, M. A., & Haddad, F. S. (2009). PHILOS plate fixation for displaced proximal humeral fractures. Journal of Orthopaedic Surgery, 17(1), 15-18.

[2] Handoll, H. H., & Brorson, S. (2015). Interventions for treating proximal humeral fractures in adults. The Cochrane Database of Systematic Reviews, (11), CD000434.

[3] Olerud, P., Ahrengart, L., Ponzer, S., Saving, J., & Tidermark, J. (2011). Internal fixation versus nonoperative treatment of displaced 3-part proximal humeral fractures in elderly patients: a randomized controlled trial. Journal of Shoulder and Elbow Surgery, 20(5), 747-755.

[4] Zyto, K., Ahrengart, L., Sperber, A., & Törnkvist, H. (1997). Treatment of displaced proximal humeral fractures in elderly patients. Journal of Bone and Joint Surgery. British Volume, 79-B(3), 412-417.

[5] Court-Brown, C. M., & Caesar, B. (2006). Epidemiology of adult fractures: A review. Injury, 37(8), 691-697.

..