ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE
DEPARTMENT OF ORTHOPEDICS & TRAUMA SURGERY

FUNCTIONAL OUTCOME OF PROXIMAL HUMERUS FRACTURE TREATED WITH PHILOS PLATE AT TASH OVER THREE YEARS: RETROSPECTIVE CROSS SECTIONAL STUDY (2025).

ADDIS ABABA UNIVERSITY.
ADDIS ABABA, ETHIOPIA.
BY: ADONIAS AGER SINSHAW, MD

A thesis to be submitted to the Department of Orthopedics and Traumatology, School of Post Graduate Studies, College of Health Sciences, Addis Ababa University in partial fulfillment of the requirements for a specialty certificate in Orthopedics and Trauma Surgery

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Functional outcome of proximal humerus fracture treated with PHILOS plate at TASH over three years: retrospective cross sectional study (2025)

BY: ADONIAS AGER SINSHAW, MD

MAIN ADVISOR: DR. NATAN WONDOSSEN, MD, ASSISTANT PROFESSOR OF ORTHOPEDIC AND TRAUMA SURGERY

CO-ADVISOR: DR. MELESE GARDIE, MD, ASSISTANT PROFESSOR, CONSULTANT ORTHOPEDICS, ARTHROPLASTHY AND ARTHROSCOPIC SURGEON.

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ADVISOR'S APPROVAL SHEET

This is to certify that the thesis entitled "Functional outcome of proximal humerus fracture treated with PHILOS plate at TASH over three years: A retrospective cross sectional study (2025) is submitted in partial fulfillment of the requirements for the Specialization Certificate in Orthopedic surgery to the department of orthopedic surgery and Traumatology, Addis Ababa University college of health science and has been carried out by **Adonias Ager Sinshaw** under my supervision. Therefore, I recommend that the student has fulfilled the requirements and hence hereby can submit the Thesis to the Department.

Natan Wondossen, MD ____ _____

Name of Major Advisor Signature Date

Melese Gardie , MD ---------- ----------

Name of co-Advisor signature Date

Acknowledgment

First, I would like to thank Addis Ababa University, department of Orthopedic and Trauma Surgery for giving me this golden opportunity to practice research. Secondly, my gratitude goes to my adviser Dr. Natan Wondossen and Dr. Melese Gardie who had given me a good deal of his time and skills in providing me with guidance and advice to do this thesis.

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Abbreviation/Acronyms

TASH----------Tikur anbessa specialized hospital

PHILOS----------Proximal Humerus Interlocking System

AVN----------Avascular necrosis

ORIF----------Open reduction and internal fixation

IRB----------Institutional review board

SD---------- Standard deviation

IQR----------Interquartile range

SSSI----------Superficial surgical site infection

IA----------Intra-articular

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1 Abstract

Introduction: Proximal humerus fractures hold a significant portion of upper limb injuries, particularly among older adults and individuals exposed to high-energy trauma. Although the PHILOS (Proximal Humerus Interlocking System) plate has become a frequently accepted fixation method due to its angular stability and favorable functional outcomes, its practical use in Ethiopia remains held down by resource constraints, postoperative follow-up challenges, and variability in rehabilitation services. This study discovered the functional outcomes, union rates, and complication profile of proximal humerus fractures treated with PHILOS plates at Tikur Anbesa Specialized Hospital (TASH) over three years period.

Methods: A retrospective cross sectional study was conducted on 48 adult patients who underwent PHILOS plate fixation for proximal humerus fractures at TASH between November 2021 and October 2024. Demographic, clinical, surgical, and radiographic data were extracted from medical records and described in descriptive analysis. Functional outcomes were assessed using the Constant-Murley score. Patients with at least 1year of followed-up were included in the functional outcome analysis.

Results: The majority of patients were female (60%), with the 50–59-year age group most commonly affected. Falls (52.1%) were the leading cause of injury. Two-part fractures were the most common pattern (58.3%). Fracture union at one year was achieved in 91.7% of patients. Superficial infection (12.5%) and implant failure (10.4%) were the most frequent complications. The mean Constant-Murley score was 80 and 89.5% of patients demonstrated good to excellent outcomes.

Conclusion: PHILOS plate fixation provides favorable functional outcomes and acceptable union rates for proximal humerus fractures in the Ethiopian context, despite systemic barriers. Fracture union rate and proportion of complications are comparable with regional and international studies. This study provides essential evidence to support improved fracture management with comparable functional outcome to other regional and international studies.

Keywords: Proximal humerus fracture, PHILOS plate, functional outcome, Constant-Murley score, union rate, Ethiopia, Tikur Anbesa Specialized Hospital.

2 Introduction

2.1 Background

Proximal humerus fractures constitute approximately 5% of all fractures in orthopedic practice (16) and are one of the most common upper extremity fractures after distal radius fractures (16). The incidence of proximal humerus fractures is increasing, largely due to an aging population and the associated prevalence of osteoporosis.

High-energy trauma remains an important cause of proximal humerus fractures. Many of these fractures are stable with minimal displacement, and therefore, closed treatment is often the method of choice (17). However, fractures displaced more than 45 degrees or by more than 1 cm are recommended to be managed with open reduction and internal fixation (20).

PHILOS locking plates provide an effective treatment option, particularly for fractures with poor bone quality or comminution (17). Studies have demonstrated that functional outcomes with PHILOS plates are generally favorable, being effective and safe, with the number of fracture fragments not significantly affecting the results (17, 18). The PHILOS plate also shows high fracture union rates and notable improvements in functional recovery (19). Utilizing Neer's scoring system allows a comprehensive assessment of functional outcomes, further highlighting the efficacy of PHILOS plating in restoring shoulder function and patient satisfaction (19).

2.2 Statement of problems

Proximal humerus fractures are among the most common fractures of the upper extremity, particularly in adults and the elderly population. With increasing life expectancy and the rising incidence of road traffic accidents, the burden of these injuries is growing, especially in low- and middle-income countries. Management of proximal humerus fractures remains challenging due to fracture complexity, variable bone quality, and the risk of postoperative complications that may adversely affect functional outcomes.

Open reduction and internal fixation using the Proximal Humerus Internal Locking System (PHILOS) plate is widely practiced for the treatment of displaced proximal humerus fractures. Although this technique provides stable fixation and allows early mobilization, reported outcomes in the literature are inconsistent, with complication rates ranging from screw cut-out and varus collapse to infection and

shoulder stiffness. These complications can significantly compromise fracture union and shoulder function.

In Ethiopia, particularly at Tikur Anbessa Specialized Hospital, PHILOS plate fixation is commonly used for proximal humerus fractures due to its availability and cost-effectiveness. However, there is limited local evidence evaluating functional outcomes and identifying factors associated with poor results following this treatment. The absence of context-specific data makes it difficult to assess the effectiveness of PHILOS plate fixation and to guide clinical decision-making and postoperative management.

Therefore, this study was conducted to assess the functional outcome of proximal humerus fractures treated with PHILOS plate fixation at Tikur Anbessa Specialized Hospital and to identify predictors of outcome, including the impact of postoperative complications, in order to generate evidence that can inform clinical practice and improve patient care in the local setting.

2.3 Significance of the study

This study provided local evidence on the functional outcomes of proximal humerus fractures treated with PHILOS plate fixation at Tikur Anbessa Specialized Hospital. By evaluating postoperative shoulder function using validated outcome measures, the findings helped to assess the effectiveness of PHILOS plate fixation within the context of a resource-limited setting.

The study identified factors associated with functional outcome, including the impact of postoperative complications, which may assist surgeons in improving patient selection, surgical technique, and postoperative care. The results may also contributed to better preoperative counseling by providing realistic expectations regarding recovery and functional results.

In addition, the findings might serve as a reference for orthopedic surgeons, residents, and hospital administrators in optimizing fracture management protocols and rehabilitation strategies. The study also highlighted areas requiring further investigation and may form a foundation for future prospective and multi-center research on proximal humerus fracture management in Ethiopia.

3 Literature review

Proximal humerus fractures are common fractures in orthopedics and trauma practice, particularly among older adults due to age-related osteoporosis. Transformative change has been brought due to introduction of locking plate, particularly Proximal Humerus Inter Locking System (PHILOS in orthopedics practice. This review examines the efficacy, potential complications, and clinical results associated with the use of PHILOS plates in treating proximal humerus fractures.

The proximal humerus is an anatomically complex and challenging region encompassing the humeral head, greater and lesser tuberosities, and the surgical neck. The critical nearby neurovascular structures and the bio-mechanical demands of the shoulder make proximal humerus fracture management challenging. Locking plates, like the PHILOS system, enhance fixation stability by evenly distributing stress and preventing screw loosening, particularly in osteoporotic bone. Orthopedics Indications for PHILOS plate are complex fracture patterns, such as displaced fractures or those classified as Neer types II-IV, where achieving functional recovery is essential. Angular stability is easily achieved by locking system, which is particularly advantageous in bones weakened by osteoporosis.

Research has consistently established promising outcomes following PHILOS plate fixation. Functional assessments using tools such as the Constant-Murley and DASH (Disabilities of the Arm, Shoulder, and Hand) scores indicate that 70-80% of patients achieve good to excellent recovery (1, 2). Union rates are reported to be high, ranging from 90% to 95%, with an average healing duration of 12 to 16 weeks (3, 4). Postoperative rehabilitation plays a significant effect in restoring shoulder function, with satisfactory results in forward flexion and abduction when prescribed protocols are followed (5).

PHILOS plate fixation is not without complications. A common issue is intra-articular screw penetration, which is particularly prevalent in osteoporotic bones and occurs in up to 20% of cases (6). Additionally, disruption of blood supply to the humeral head can lead to avascular necrosis (AVN), especially in more complex fractures (7). Infection rates range from 1% to 5%, while hardware failure, though infrequent, may necessitate revision procedures (8). Limited shoulder range of motion is resulted due to inappropriate plating positioning due to sub-acromial impingement. (9).

Comparisons with other treatment, PHILOS plate provide additional benefit. While non-operative management may suffice for minimally displaced fractures, it often yields less favorable functional outcomes in complex cases (1). Though Intramedullary nails, associated with reduced soft tissue complications, offer less angular stability compared to PHILOS plates (10). Arthroplasty procedures, including hemiarthroplasty and reverse shoulder arthroplasty, are typically reserved for irreparable fractures or those with severe comminution. These approaches can provide pain relief but may not achieve the range of motion possible with PHILOS plate fixation (11).

Innovations in PHILOS plate technology have further enhanced its utility. Osteoporotic bones fracture fixation has been improved with augmented screw placement techniques (12). Due to individual anatomical variations, pre-countered plated has been developed to match the difference (13). Biomechanical research continues to refine screw trajectory and minimize complications (14). Postoperative recovery protocols emphasize the importance of early passive motion followed by active strengthening exercises to prevent stiffness and optimize functional outcomes. Adherence to physiotherapy significantly influences long-term results (15).

In conclusion, the PHILOS plate has an acute shift in the surgical management of proximal humerus fractures, particularly in challenging and osteoporotic cases. Despite a learning curve and associated risks, its ability to restore anatomical alignment and shoulder function makes it a preferred option. Continued research focusing on individualized treatment strategies and technological advancements is expected to further enhance its clinical application

4 Objectives

4.1 General Objective

To investigate the functional outcomes of proximal humerus fractures managed using the PHILOS plate at Tikur Anbesa Specialized Hospital over a three-year period.

4.2 Specific Objectives

1. Patient Profile and fracture characteristics: Examine age, gender, mechanism of injury and fracture classification among individuals treated with the PHILOS plate.
2. Evaluate functional outcome recovery: Assess shoulder mobility and overall functional outcomes using standard scoring tools.
3. Identify post-operative challenges: Document complications such as infections, or delayed healing an and hardware failure
4. Asses fracture union rate.

5 Methodology and materials

5.1 Study Design and Setting

A cross sectional hospital-based study was conducted at Tikur Anbessa Specialized Hospital over a three-year period from November 2021 and October 2024. The study was retrospective in nature; functional outcomes were assessed at a minimum of one year following surgery.

5.2 Study Population

All adult patients who underwent surgical treatment for proximal humerus fractures using PHILOS plate fixation during the study period were included. Patients with pathological fractures, open fractures, poly-trauma involving the same limb, incomplete medical records, or those lost to follow-up were excluded from the study.

5.3 Sample Size and Sampling Technique

A census sampling method was used, whereby all eligible patients who met the inclusion criteria during the study period were included in the study. Formal sample size calculation was not performed due to the census nature of the study; however, inclusion of all available cases was intended to maximize the study's statistical power.

5.4 Data Collection

Data were collected retrospectively from patient medical records, operative notes, and follow-up clinic records. Additional information related to functional outcome was obtained through direct patient assessment during follow-up visits.

5.5 Outcome Measures

Functional outcome was assessed using the Constant-Murley score as the primary outcome measure, which is a validated tool for assessing shoulder function. The Constant-Murley score evaluates pain, daily activities, range of motion, and strength, with higher scores indicating better function.

5.6 Data Analysis

Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics were used to summarize patient demographics, fracture characteristics, fracture union rate and functional outcomes.

5.7 Ethical Considerations

Ethical clearance was obtained from the institutional review board of Addis Ababa University, College of Health Sciences. Patient confidentiality was maintained throughout the study, and all data were anonymized prior to analysis.

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6 Data Analysis

6.1 Socio-Demographics

The majority of patients in our study with proximal humerus fractures were female, accounting for 60% of the cohort. The most commonly affected age group was 50–59 years, representing 25% (n = 12) of patients, followed by the 40–49 years age group at 22.9% (n = 11). Additionally, the right side was more frequently involved in the fractures.

Table1. Distribution by Age Group (Years)

Category (Age)	Number (n)	Percentage (%)
20–29	6	12.5
30–39	6	12.5
40–49	11	22.9
50–59	12	25.0
60–69	7	14.6
70–79	5	10.4
80–89	1	2.1
Total	48	100%

Figure 1: distribution of proximal fracture by sex

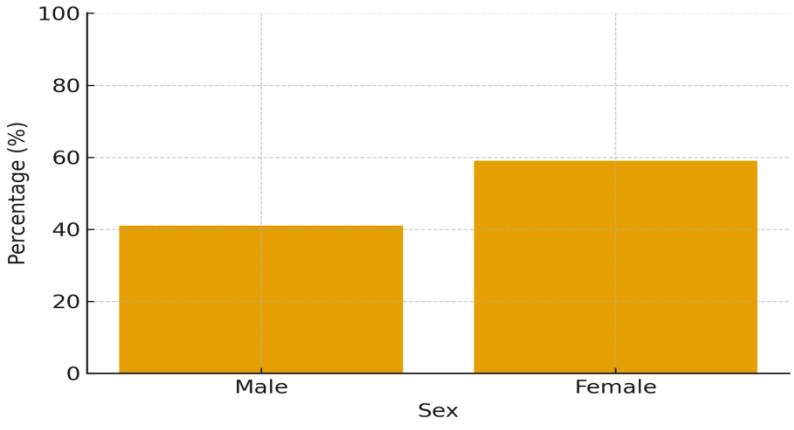
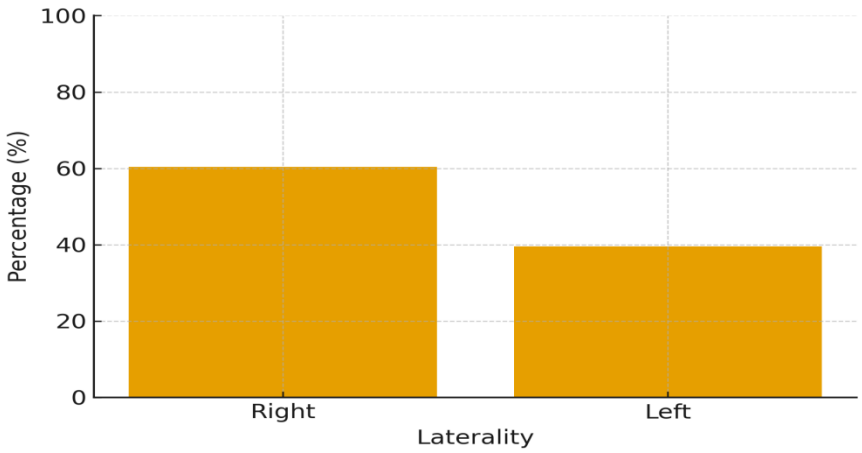


Figure 2: The distribution of proximal humerus fracture based on side of the limp



6.2 Fracture etiology, type, union and comorbidity status

The most common mechanism of injury was a fall, accounting for 52.1% (n = 25) of cases, followed by road traffic injuries (RTI) at 27.1% (n = 13). According to the Neer classification, two-part fractures were the most frequent, representing 58.3% (n = 28) of patients, followed by three-part fractures at 33.3% (n = 16), and four-part fractures at 8.3% (n = 4). The majority of patients (72.9%, n = 35) had no comorbidities at the time of diagnosis. Among those with comorbid conditions, diabetes mellitus and hypertension were the most common, each accounting for 8.3% (n = 4). A significant proportion of patients with proximal humerus fractures treated with PHILOS plate fixation achieved fracture union at one-year follow-up, with a union rate of 91.7% (n = 44).

Table 2: Distribution by Mechanism of Injury (MOA)

Category	Number (n)	Percentage (%)
Fall	25	52.1
Road Traffic Injury (RTI)	13	27.1
Sport-related	3	6.3
Construction	2	4.2
Other/Unspecified	5	10.4
Total	48	100

Table 3: distribution of proximal fracture with associated comorbidity

Category	Number (n)	Percentage (%)
None	35	72.9
Diabetes mellitus	4	8.3
Hypertension	4	8.3
HIV	3	5.2
Epilepsy	1	3.1
Asthma	1	2.1
Total	48	100%

Figure 3: the percent of union at one year follow up

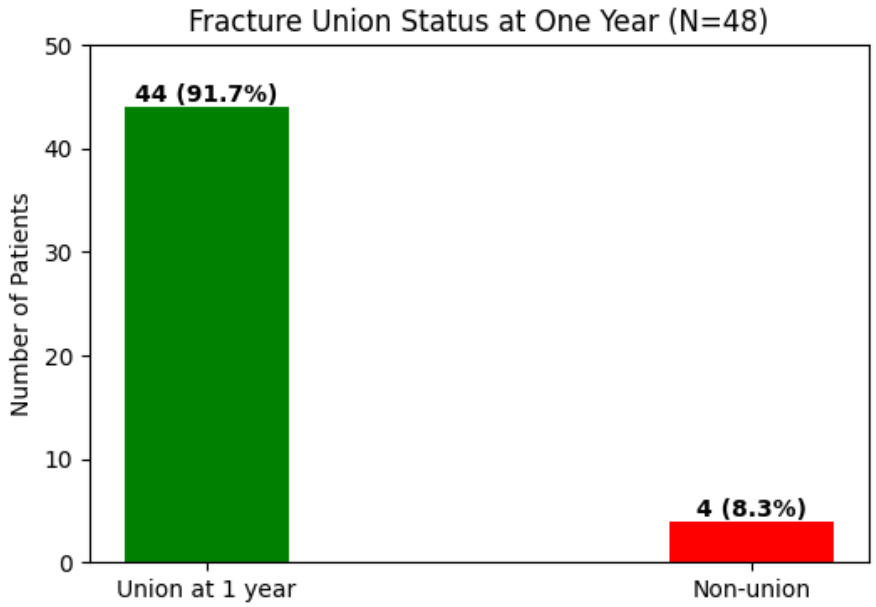
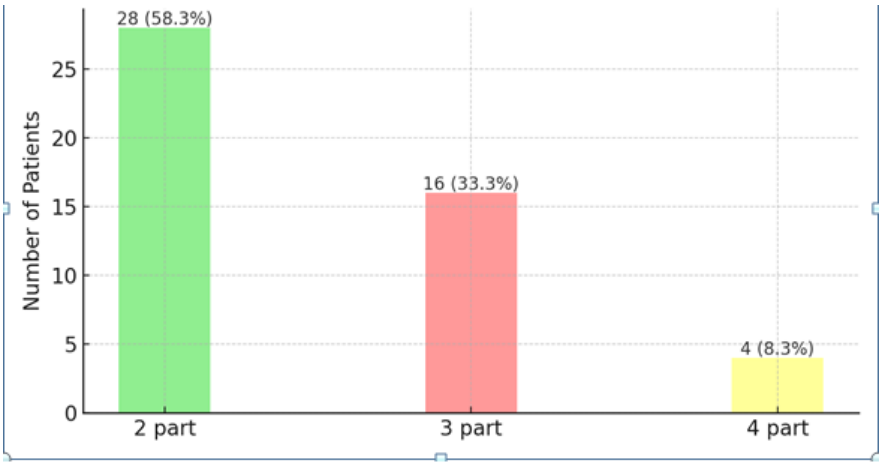


Figure 4: percentage distribution of Neer fracture types (2-part, 3-part, and 4-part).



6.3 Surgical duration, complication and functional outcome

In a significant proportion of patients, the surgical duration ranged from 2 to 3 hours. The most common postoperative complication was superficial infection, occurring in 12.5% (n = 6) of patients, followed by implant failure in 6.25% (n = 3). Approximately 77% (n = 37) of patients reported mild to no disability symptoms. The average Constant-Murley score was 80, and 89.5% (n = 43) of patients achieved good to excellent outcomes according to the Constant-Murley scoring system.

Table 4: Distribution by Complication

Category	Number (n)	Percentage (%)
None	37	77
Surgical site infection (SSSI)	6	12.5
Implant failure	3	6.25
IA screw complication	1	2.1
Non-union (without implant failure)	1	2.1
Total	48	100%

Figure 5: Duration/length of operation

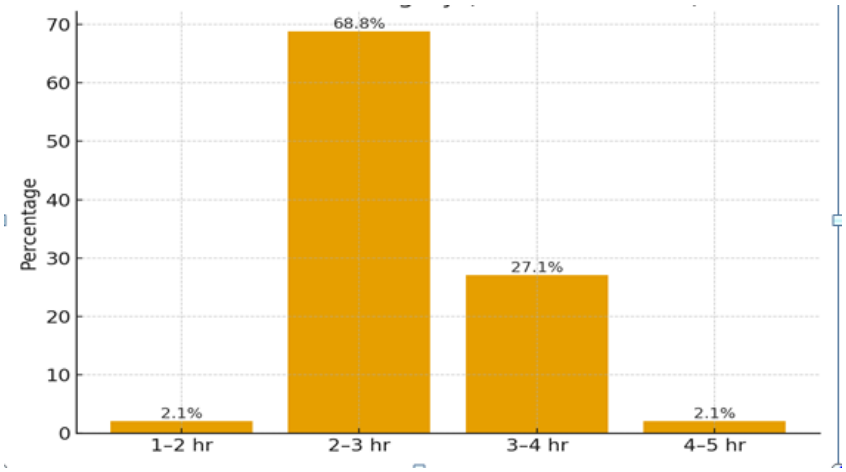
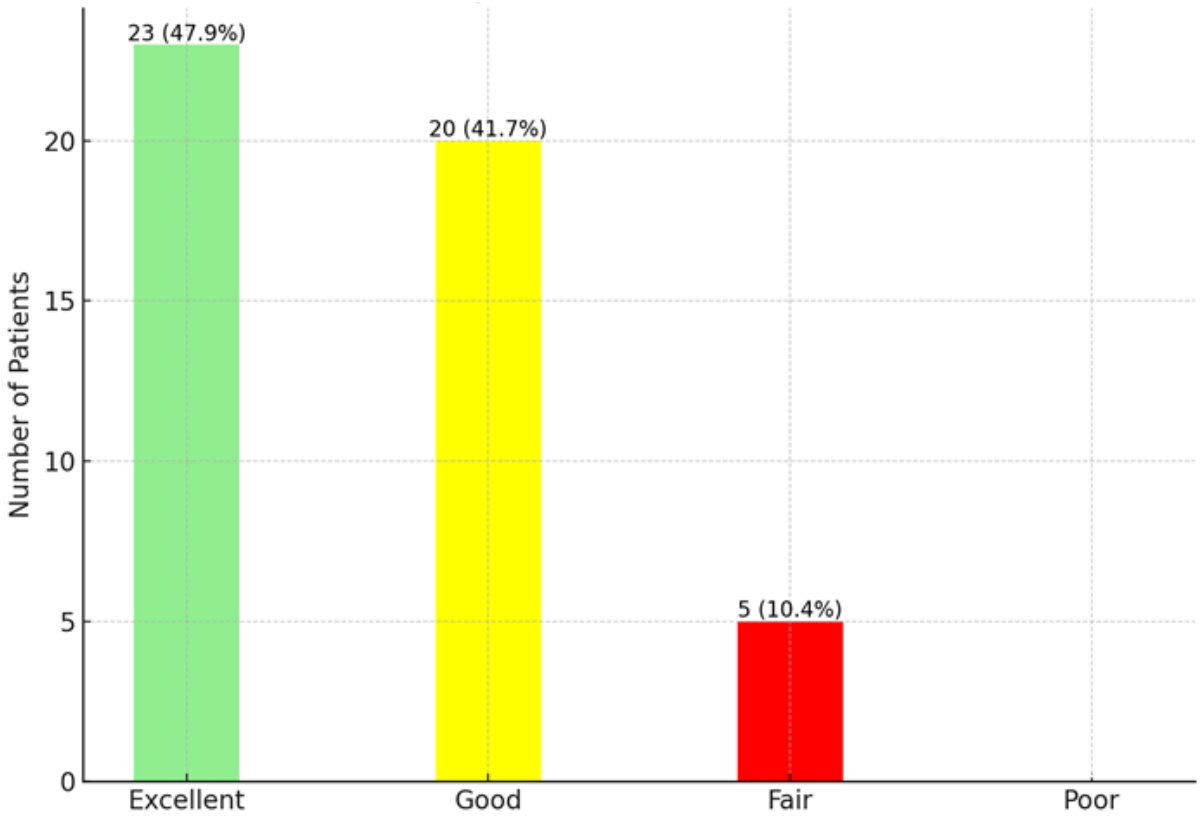


Figure 6: distribution of constant-murley score



7 Discussion

Proximal humerus fractures continue to pose significant challenges in orthopedic practice due to their complex anatomy and the variability in fracture patterns. Managing these fractures effectively requires careful consideration of patient factors, fracture type, and surgical technique to achieve optimal functional outcomes.

According to GN Kiran Kumar et al. (1), a 2014 study in China on 51 patients with proximal humerus fractures treated with PHILOS plate fixation reported that approximately 77% of patients achieved good to excellent Constant-Murley scores after 12 to 44 months of follow-up. This finding aligns with the results of our study.

A prospective study by Varun Kumar Reddy et al. (2) in India in 2019, which included 30 patients, reported that the most commonly affected age group was 31–35 years (n = 9, 30%), followed by 20–25 years (n = 7, 23.33%). In contrast, in our study, most patients were in the 50–59 years age group (16%), followed by 30–39 years (11%). Additionally, while males predominated in their cohort, females were more commonly

affected in our study. Reddy et al. also reported that most injuries were caused by road traffic accidents (RTA) (n = 22, 73.33%), followed by falls on an outstretched hand (n = 7, 23.33%) and assaults (n = 1, 3.33%). This explains the lower age range and higher male prevalence in their population. Conversely, in our study, falls were the leading cause of injury (n = 28, 58.3%), followed by RTAs (n = 15, 31.2%) and sports-related injuries (n = 3, 6.2%), which accounts for the higher proportion of females and older patients in our cohort. Reddy et al. also reported that the right side was involved in 18 cases (60%) and the left side in 12 cases (40%), with 90% of fractures being two- and three-part fractures, consistent with our findings.
Another prospective study by Arindam Chatterjee et al. (3) in India, involving 58 patients treated with PHILOS plate fixation and followed for at least one year, reported that 13.8% of patients had hypertension and 10.3% had diabetes mellitus—comorbidities also observed in our study. They reported a 6.6% rate of superficial infection and a 3.3% rate of hardware failure, whereas our rates were 12.5% and 6.25%, respectively, which are relatively higher and may indicate the need for improved surgical technique or postoperative care.

A retrospective cross-sectional study by Fazli Wajid et al. (5) in Pakistan on 50 patients reported a union rate of 96% (n = 48) at an average follow-up of 16 weeks. In our study, the union rate was 91.7% at one year, which is comparable but slightly lower, suggesting the importance of optimizing surgical techniques, careful patient selection, and postoperative management to improve outcomes.

Finally, GN Kiran Kumar et al. and Arindam Chatterjee et al. reported mean Constant-Murley scores of 79 and 81, respectively, which are comparable to the mean score of 81 observed in our study, further supporting the effectiveness of PHILOS plate fixation in achieving favorable functional outcomes.

Overall, PHILOS plate fixation demonstrates reliable fracture union and satisfactory functional recovery, even in complex clinical settings such as Ethiopia. Attention to minimizing postoperative complications remains critical to further improving patient outcomes.

8 Conclusion

This study demonstrated that the use of PHILOS plates for the surgical management of proximal humerus fractures yields favorable functional outcomes. The majority of patients achieved good to excellent recovery, as reflected in the mean Constant-Murley score of 80 and a high proportion (89.5%)

of patients attaining good to excellent results. Fracture union was achieved in 91.7% of cases, indicating effective stabilization provided by the PHILOS plate.

Overall, the PHILOS plate represents a reliable and effective treatment option for proximal humerus fractures, offering stable fixation, high union rates, and substantial functional recovery. These findings provide a foundation for improving fracture care protocols and patient management strategies in Ethiopian orthopedic practice.

9 Recommendation

The findings of this study are consistent with contemporary research in other parts of the world. Moreover, I strongly recommend prioritizing primary joint replacement for four part proximal humerus fracture than fixation as it has high non-union rate.

10 Ethical consideration

Approval: Ethical clearance was sought from the Institutional Review Board (IRB) of Addis Ababa University, College of Health Sciences.

Confidentiality: Patient identifiers were anonymized to maintain privacy. Data was securely stored and accessible only to authorized researchers.

Consent Waiver: As this study involved a retrospective review of existing data, a waiver of informed consent was requested from the IRB.

11 Strength and limitations

11.1 Strength

To the best of our knowledge, this is the first study to provide a comprehensive evaluation of both functional and radiological outcomes of patients treated with PHILOS plate fixation for proximal humerus fractures at our institution, offering valuable insights into current clinical performance and areas for improvement.

11.2 Limitations

The retrospective design may lead to incomplete data and limit the ability to establish causal relationships. Potential bias from missing or incomplete patient records.

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13 QUESIONRIES ENGLISH VERSION

13.1 Constant-Murley Score Questionnaire

For the Study: Management of Proximal Humerus Fractures Using PHILOS Plate at Black Lion Specialized Hospital. This questionnaire evaluates shoulder function based on four categories: pain, activities of daily living, range of motion, and strength. The maximum score is 100 points, indicating excellent shoulder functionality.

1. Patient Information
2. Patient ID: ----------
3. Age /sex: ----------/----------
4. MOA: ----------
5. Neer fracture type 2/3/4 part----------
6. Date of Assessment: ----------
7. Any comorbidity ------yes/no---------yes----------?
8. Side of Injury: Right / Left
9. Duration injuries to surgery----------
10. Time of union on x ray after operation----------

11. Date of surgery ---------- duration----------

1. Pain (15 Points)

How much pain do you experience in your shoulder?

No pain: 15 points

Mild pain: 10 points

Moderate pain: 5 points

Severe pain: 0 points

2. Activities of Daily Living (20 Points)

Rate your ability to perform the following tasks:

Work or recreational activities:

Full: 4 points

Reduced: 2 points

Unable: 0 points

A. Lifting ability:

Above shoulder height: 4 points

Up to shoulder height: 2 points

Below shoulder height: 0 points

B. Carrying ability (e.g., a shopping bag):

Normal: 4 points

Reduced: 2 points

Unable: 0 points

C. Sleeping on the affected side:

No difficulty: 4 points

With discomfort: 2 points

Unable: 0 points

3. Range of Motion (40 Points)

Measured with a goniometer.

A. Forward Elevation

0°–30°: 2 points

31°–60°: 4 points

61°–90°: 6 points

91°–120°: 8 points

121°–150°: 10 points

151°–180°: 12 points

B. Abduction

(Same scoring as forward elevation)

C. Internal Rotation

Ability to reach:

Sacrum: 2 points

L2–L4: 4 points

T12: 6 points

T8: 8 points

T6: 10 points

D. External Rotation

Ability to reach:

Side of head: 4 points

Behind head: 6 points

Full external rotation: 10 points

4. Strength (25 Points)

Measure using a dynamometer or resistance testing.

Normal strength: 25 points

Reduced strength: Proportionally scaled based on percentage of normal.

Total Score Calculation

Maximum possible score: 100 points.

Interpretation of the Constant-Murley Score

85-100 Points: Excellent shoulder function with minimal or no pain and full range of motion.

71–85 Points: Good function with mild limitations, such as slight discomfort or reduced strength.

55–70 Points: fair function with some noticeable restrictions in movement or strength during daily activities.

<55 Points: Poor function with significant pain and restricted mobility affecting daily tasks.

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14 የጥያቄዎች መዝገብ (Amharic Version)

14.1 Constant–Murley Score Questionnaire

ይህ መዝገብ የትከሻ ተግባርን በአራት ምድቦች ይገመታል፦ የህመም ደረጃ፣ የዕለት ተዕለት ተግባሮች፣ የእንቅስቃሴ ክልል (Range of Motion) እና ኃይል። ከፍተኛው ነጥብ 100 ሲሆን ይህ ጤናማ የትከሻ እንቅስቃሴን ያመለክታል።

የሕመምተኛ መረጃ

a. የሕመምተኛ መለያ: ----------
b. ዕድሜ / ፆታ ---------- / ----------
c. የጉዳት መንስኤ (MOA): ----------
d. የNeer የቁስል አይነት 2/3/4 part ----------
e. የግምገማ ቀን: ----------
f. ማንኛውም ተያያዥ በሽታ (Comorbidity): አዎ/አይደለም — አዎ ከሆነ ----------?
g. የጉዳት ቦታ: ቀኝ / ግራ
h. ከጉዳት እስከ ቀዶ ጥገና ጊዜ ----------
i. በኤክስ-ሬይ ላይ የቁስል መያጎ (union) የታየበት ጊዜ ----------
j. • የቀዶ ጥገና ቀን ---------- ቆይታ ----------

1. ህመም (15 ነጥቦች)

በትከሻዎ ምን ያህል ህመም ትሰማለህ/ለሽ?

• ምንም ህመም የለም: 15 ነጥብ

• ቀላል ህመም: 10 ነጥብ

• መካከለኛ ህመም: 5 ነጥብ

• ከባድ ህመም: 0 ነጥብ

2. የዕለት ተዕለት ተግባሮች (20 ነጥቦች)

የሚከተሉትን ተግባሮች ለመፈጸም ችሎታዎን ይደረግ፡፡

1. የስራ ወይም የመዝናኛ ተግባሮች

• ሙሉ: 4 ነጥብ

• ቀናሽ: 2 ነጥብ

• አይቻልም: 0 ነጥብ

2. መሸከም ችሎታ

• ከትከሻ በላይ ማንሳት: 4 ነጥብ

• እስከ ትከሻ መድረስ: 2 ነጥብ

• ከትከሻ በታች: 0 ነጥብ

3. የመሸከም ችሎታ (ምሳሌ፦ የግብጥ ቦርሳ)

• መደበኛ: 4 ነጥብ

• ቀናሽ: 2 ነጥብ

• አይቻልም: 0 ነጥብ

4. በተነዳው ጎን መተኛት

• ምንም ችግኝ የለም: 4 ነጥብ

• ጭካኔ አለ: 2 ነጥብ

• አይቻልም: 0 ነጥብ

3. የእንቅስቃሴ ክልል (Range of Motion) – 40 ነጥቦች

በgoniometer ይለካል።

A. ወደፊት እርግጥ (Forward Elevation)

• 0°–30°: 2 ነጥብ

• 31°–60°: 4 ነጥብ

• 61°–90°: 6 ነጥብ

• 91°–120°: 8 ነጥብ

• 121°–150°: 10 ነጥብ

• 151°–180°: 12 ነጥብ

B. አብዱክሽን (Abduction

(እኩል ደረጃ ነጥብ አሠራር)

C. ውስጥ ሽክርነት (Internal Rotation)

መድረስ የሚችለው ቦታ፡-

• Sacrum: 2 ነጥብ

• L2–L4:4 ነጥብ

• T12: 6 ነጥብ

• T8: 8 ነጥብ

• T6: 10 ነጥብ

D. ውጭ ሽክርነት (External Rotation)

መድረስ የሚችለው ቦታ፡-

• የጭንቅላት ጎን: 4 ነጥብ

• ከትከሻ በላይ / በራስ ደረት: 6 ነጥብ

• ሙሉ ውጭ ሽክርነት: 10 ነጥብ

4. ኃይል (25 ነጥቦች

በdynamometer ወይም በResistance Testing ይመዘን።

• መደበኛ ኃይል: 25 ነጥብ

• የቀነሰ ኃይል: በመቶኛ መጠን ተመጣጣኝ ይሆናል።

ጠቅላላ ውጤት ስሌት : ከፍተኛው ውጤት:100 ነጥብ

የConstant–Murley Score ትርጓሜ

• 85–100 ነጥብ:በጣም ጥሩ የትከሻ ተግባር፣ አነስተኛ ወይም ምንም ህመም የለም።

• 71–85 ነጥብ: ጥሩ ተግባር፣ ትንሽ ጭካኔ ወይም ኃይል መቀነስ።

• 55–70 ነጥብ: መካከለኛ ግዴታ፣ በዕለት ተዕለት ተግባሮች ገደብ የሚገኝ።

• <55 ነጥብ:ደካማ ተግባር፣ ከባድ ህመም እና እንቅስቃሴ ገደብ።