

**Original Article**  
**Orthopaedics**

# PROSPECTIVE STUDY OF MANAGEMENT OF CLOSED FRACTURE PROXIMAL HUMERUS IN ELDERLY PATIENTS (>60YR) AGE THROUGH ORIF WITH PHILOS PLATING TECHNIQUE

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**Abstract:**

This paper presents assessment of prospective study conducted for the management of closed fracture Proximal humerus in elder patients (>60yr) through PHILOS plating and comparing the results in terms of functional outcome with existing standard literatures and results of various other studies based on same treatment modalities. In this study a sample of 16 patients were taken with closed fracture proximal humerus all of which were managed through ORIF with PHILOS plating. Sample patients were treated reviewed and followed till the end of the study to analyze the functional outcome in terms of two standard scaling methodology i.e Visual analogue scale (VAS) and constant Murley score.

Based on assessment it was found that average constant Murley score of all patients was measured 87.6 (range 64-100) after final follow up. It was found that values of results were varied depending upon different factors like more the grading of fracture worst will be score, associated co-morbidities of patients like diabetes, neurovascular deficit and others also deteriorates the score. Similarly mean VAS score was found to be 2.4 range (0-10) after final follow up.

Under the study results obtained were coherent to expected outcomes based on various recognize previous studies, literature, and were found satisfactory in nature. In the study outcomes were outlined in terms of both

pros and cons. We have observed that management through PHILOS plating provides more stable fixation in terms of early range of mobility, minimal post op complication, minimal implant rejection and early functional efficiency in comparison to already existing literatures over management of such fractures, findings of various previous studies and also with other prescribed treatment modalities like conservative treatment and Percutaneous K wire fixation, Hemiarthroplasty, which provides efficiency in terms of minimal invasiveness, minimal soft tissue damage and cost effective treatment.

**Key words:** Proximal humerus fracture, ORIF (Open reduction and internal fixation), PHILOS (Proximal humerus internal locking system), Percutaneous K wire fixation.

## Introduction

Incidence of closed fracture proximal humerus are common now a days and rising due to increase in frequency of RTA (road traffic accidents) and more particularly in elderly population because of osteoporotic bone which further add risk to the bony fractures. Grossly it has been observed that such fractures contributes 5-6% of all the fracture however in terms of fracture in elder age population, they contribute third most common fracture type after hip and distal end radius fracture. In cases where fracture is undisplaced, minimally displaced or having low grading (NEER's grading) management can be done through closed reduction where as in fractures which are either significantly displaced, multiple fragmented or high graded (NEER's grading) then management requires closed reduction internal fixation with PHILOS plating.<sup>1,2,3</sup>

Different guidelines has been prescribed for management of fracture proximal humerus in old age population as seen above like conservative management, percutaneous K wire fixation, PHILOS plating and hemiarthroplasty of shoulder joint.<sup>4,5,6</sup> Application of each of these modality depends on various indicators like age of patient, associated co-morbidities, required level of activity for concerned patient, personal history, type of fracture, post operative care and more. It was observed that around 90% of the patient who have been treated by PHILOS plating has shown remarkable clinical outcomes with better functional mobility of joint and least complications.<sup>7,8</sup> However, they have to undergo open surgical reduction which cause extensive soft tissue damage, injury to neurovascular

structure, and infections leading to necrosis of humerus head in long term.<sup>9,10</sup>

In case of management by other available modalities these drawbacks of infections, soft tissue damage, trauma to neurovascular structures and others are limited as mentioned in standard literatures, but they also has issues like proper anatomical reduction, early mobilization and stable fixation are not as good as seen in PHILOS plating.<sup>11,12</sup> Upto certain degree they also has complications like malunion, stiffness of joint, Pin tract infection and long duration treatment for recovery of functional mobility.<sup>13,14,15</sup> In this study we have aimed to assess results of PHILOS plating fixation in terms of functional outcomes and comparing this with the same done by previous recognized studies and standard literatures. We have found our study show correlations with earlier studies and literature on same issue in terms of inferred results.

## Material And Methodology

We have conducted a study in prospective series over closed fracture humerus in elders age > 60yr for 2 consecutive years, from April 2016 Ma 2018 taking sample of 16 patients with diagnosed closed fracture proximal humerus (patients includes both emergency admissions as well as routine admissions). Inclusion criteria for the sample population was taken as

- A) Age >70yr
- B) Closed fracture and not compound
- C) Fracture should be of grade 2 or more (based on NEER'S classification)
- D) Should be a fresh and primary fracture

While the exclusion criteria for the sample are -

- A) Compound fractures
- B) Age < 60yrs
- C) Pathological fractures like those associated with metastasis etc
- D) Un-displaced or grade 1 fracture (based on NEER's classification)
- E) Old mal-united fractures

NEERS classification is standard criteria to classify closed fracture humerus into four grades depending on number of fracture part and displacement. It exclude those fracture which are compound in nature and in which some other part fracture is also involved. Sample population is selected based on inclusion criteria and definitive treatment modality is applied for management of their fracture. In the group which contains 8 male and 8 females whose average age kept above 60 years around 5 patient were diagnosed with 2 part closed fracture of proximal humerus, 8 patients were having 3 part fracture and 3 patients each were diagnosed 4 part fracture. It was ensure that average age of patients in the sample group should be above 60 yr age. Patient of sample were treated with open reduction internal fixation with proximal humerus internal locking system (PHILOS) plating, reviewed and followed till 1 year to assess the outcomes of study.

For most of the cases with fracture proximal humerus, it was observed that common mode of trauma are either road traffic accidents or fall on ground mostly at domestic areas. In few cases other modes were also seen like sports related trauma, physical assault etc.

Following is the management technique applied in different groups.

For patients with closed fracture proximal humerus ORIF with PHILOS plating is opted in our study. Under this

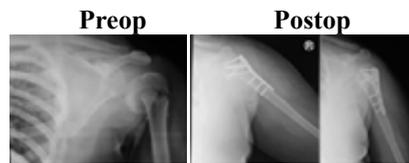
technique patients were first prepared for surgery by taking fitness from anesthetist, proper immobilization of affected segment (till the definitive surgery), preoperative antibiotic and analgesic therapy. Surgery was performed either under general anesthesia or in supraclavicular bundle block anesthesia (SCBB) depending on assessment by anesthetist. Patient was kept in supine position with a small pillow or sand bag placed under the shoulder, also pre operative antibiotic dosage and adequate blood arrangement in required patient is ensured. Then incision is given through delto-pectoral approach to expose the fracture site. After proper dissection fracture fragments were identified and reduced to their normal anatomical position using C-ARM or image intensifier. For stable reduction fragments were fixed with K wire and then PHILOS plate of appropriate size is attached and positioned lateral to bicipital groove, sparing the tendon of long head of biceps using plate holders. Plate selected for fixation is ensured to be having at least 6 locking holes for fixing humerus head and while its placement it was always kept at least one cm distal to upper end of greater tubercle. Then drilling of holes is done and screw of appropriate size are fixed into them one by one from proximal to distal. In case where avulsion or fracture of lesser tubercle is associated then it is fixed with separate screws, K wire and SS wire. During entire procedure stable reduction of fracture is checked frequently under C-ARM as well as Proper motion of joint is also assessed manually to ensure good functional outcomes. At the end wound is washed properly and closed layer by layer with a drain placed in between.

Post operated patients were

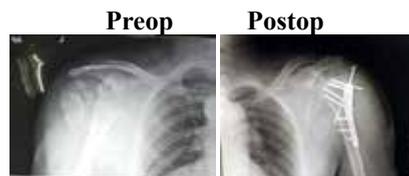
analysed at 1 Week, at the time of suture removal (12-16 days), 1 month and then at every month till 1yr. During every follow up proper imaging of operated site was done and other clinical outcomes were studied and noted so as to draw out VAS scoring and Constant murley score.

### Radiological images of various sample patients

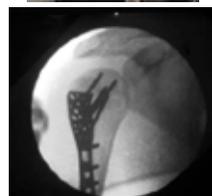
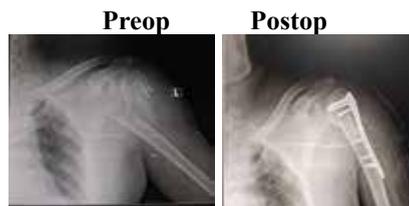
Case -01



Case 02



Case 3



Intraoperative image

### Results

- 1) Mean operation time in all patients was around 100 minutes (range is 80 -120)
- 2) One patient with 4 parts fracture was result in non union
- 3) Same patients having 4 part

fracture also came with avascular necrosis of the humerus head latter in follow up.

- 4) Patient with infection at surgical site were treated with appropriate antibiotics after culture sensitivity.

Mean constant murley score of study group was observed to be 87.6% (range 61-100) while VAS (visual analogue scale) score was 2.4 (range 0-10) after final follow up of the sample patients. Individual variation of the score is seen and has correlation with various associated factors as mentioned above in the report. All these parameters significantly indicates good clinical outcomes in terms of stable fixation, early range of mobility, short period of treatment and least complications.

Considering results of the conducted study the inference was drawn that, In spite of few avoidable complications Management of closed fracture proximal humerus in elders through ORIF with PHILOS plating gave satisfactory outcomes, which shows strong correlations with guidelines mentioned in reference literatures and with studies conducted in previous time to establish the same by various observers and scientific societies. It was also inferred that management of such observed fractures through studied procedure yields better results as compared to other prescribed treatment modalities.

### Discussion

Fractures of proximal humerus in elder patient is a widely discussed issue. These are common type of fracture in upper limb and more particular in aged population as their bones were already weak due to age related osteoporosis in such people. Strong association has

been found between the fracture and various modes like RTA (road traffic accidents), fall on ground, sports related trauma and others. All age groups show this kind of fractures with high energy RTA being common cause in young ones while low intensity simple fall on ground being common in old age population.

Various treatment modalities have been prescribed for managing such fractures ranging from conservative management, percutaneous K wire fixation, PHILOS plating to hemiarthroplasty each having their own pros and cons. But management through ORIF with internal fixation has found to be more preferred approach as mentioned in the existing literatures and has been proved repeatedly by various studies and observations conducted in the past. Although it has several drawbacks as mentioned earlier in this paper but unlike others they are mostly avoidable and manageable making it most preferred approach to deal with this kind of in all kind of cases except few exclusions.

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