

## Outcome of PHILOS Plating in Proximal Humerus Fractures

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### ABSTRACT

**Objective:** To study results of PHILOS plating in fractures of proximal humerus.

**Methods:** The Study was conducted from first July 2011 till 31st may 2015. Twenty-nine patients having fractures of the proximal humerus were initially included in the study except pathological fractures and fractures in immature skeleton. Two patients had incomplete follow up; only 27 patients had completed one year follow up in our outpatient department. All patients were operated using PHILOS plate for internal fixation. All patients were followed at 2, 6, 12(weeks), 6(months) and 1year. Oxford score and DASH) Score (Disability of arm, shoulder and hand) was used for Clinical outcome. Serial x rays were used for radiological outcome.

**Results:** Two out of 29 patient were lost to follow up, hence 27 patients were followed for one year. There were 15 male and 12 female patients whose mechanism of injury in 14 patients was road traffic accident and 13 patients gave history of fall. All patients had radiological unions at 12 weeks except one patient who got infected. Male patients achieved better outcome as compared to female with an average of Oxford score 30.2 (range 50-13) and an average DASH score 27.4 (Range 0 to 56.2) compared to 32.1(range 13t o 59) and 34 range (0 to 89.2), All the three complication that occurred were in female patient group. Seven patients had 2-part fracture, 11 had 3 part and 9 had 4 part fractures. The 3 and 4 part fracture was more common in elderly patient above 60year age.

**Conclusion:** PHILOS plating in fractures of proximal humerus has the best results particularly in the osteoporotic bones.

**Key words:** PHILOS plates, proximal humerus fracture, DASH score. Oxford score

### INTRODUCTION

Proximal humerus fractures have dual age distribution, young patient having high velocity injury to shoulder and old age patients having osteoporotic bones. High-energy trauma is increasing day by day because of an increase in motor vehicle accidents. Fractures of Proximal humerus constitute up to 5% of overall fractures and 25% of humerus fracture [1]. It is one of the commonest bones fractured in elderly patients. Neer has divided proximal humerus fractures into different types according to number of fragments. Comminuted fractures management is always difficult and results are not that good as compared to simple fractures of the same region. Whether a fracture in the proximal humerus is treated non-operatively or operatively, depends on fracture geometry, type of fracture, age of patient, quality of bone and available resources. The Different treatment modalities include closed reduction and percutaneous pinning, tension

band wires, plating and joint replacement [2-5]. Old age patients with osteoporotic bones in the proximal humerus were poor candidates for simple plating because screw purchase will be weak [6, 7]. PHILOS (proximal humerus internal locking system) plates are locking plates; pre contoured according to anatomy of proximal humerus hence called anatomically contoured locking plates. These implants are not stiff as compared to old conventional plates. In conventional plates as screws are tighten; plate is snugly fitted against bone and chances of disruption of periosteal blood flow are increased. In modern locking plat system, screw head tightens within plate and blood flow through periosteal vessels is maintained, hence considered ideal for osteoporotic bone. These plates have screws in different direction so pull out strength is more as compare to non-locking plates [8]. Anatomical reduction and rigid bone fixation helps in early mobilization and rehabilitation [9]. It has an extra advantage of multiple holes for suture anchoring rotator cuffs. This study was designed to study the functional outcome of PHILOS plating in neer type 2,3,4 part fractures.

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**METHODS**

The Study was conducted from July 2011 to May 2015. All patients with proximal humerus fractures presenting to our department were included in the study except pathological fractures and fractures in immature skeleton. There were 29 patients meeting the inclusion criteria. Two patients had incomplete follow up, only 27 patients had complete one year follow up to our outpatient department. All patients were followed at 2, 6, 12(weeks), 6(months) and 1year. A consultant on radiolucent table operated all patients with image facility. Position of the patient was supine with sandbag under the shoulder under general anesthesia. Preoperative Planning was done including radiographs of proximal humerus in anteroposterior and Axillary view. Neer’s classification system was used for labelling of all fractures. Patient’s demographic data, co morbidities and mechanism of injury were recorded. All the patients were operated through deltopectoral approach after taking informed written consent. Institutional antibiotic protocol (cefoperazone +sulbactam 2gm twice a day) was followed by giving

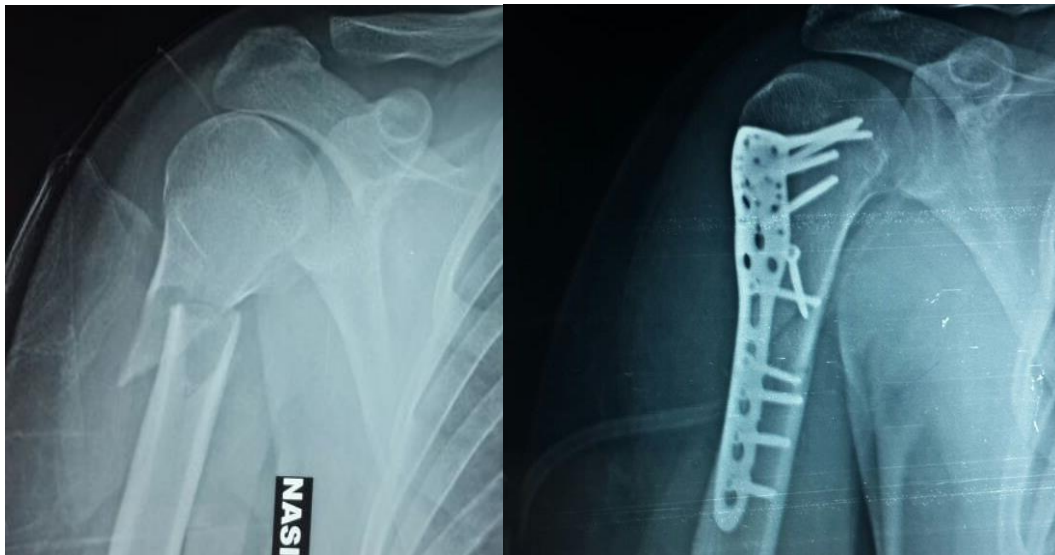
pre operative i/v antibiotic and continuing post operatively for 2days. All the fractures were checked intra operatively under C arm image intensifier for reduction and plate and screw placement. A sling was given post operatively for 02wks. Range of motion (ROM) exercises was started on next day passively as tolerated by the patient. Active ROM exercises started after 02wks. Patients were followed up at 02wk for removal of stitches and at 6wk, 12wk, 6 months and 1year to asses bony union and functional outcome by recording Oxford and DASH scores.

**RESULTS**

Two out of 29 patient were lost from follow up so 27 patients were followed for one year. There were 15 male and 12 females among whom mechanism of injury in 14 patients was road traffic accident and 13 patients gave history of fall. All patients had radiological unions at 12 weeks except one patient who got infected. This elderly patient had uncontrolled diabetes and the implant was removed after wound irrigation and debridement.

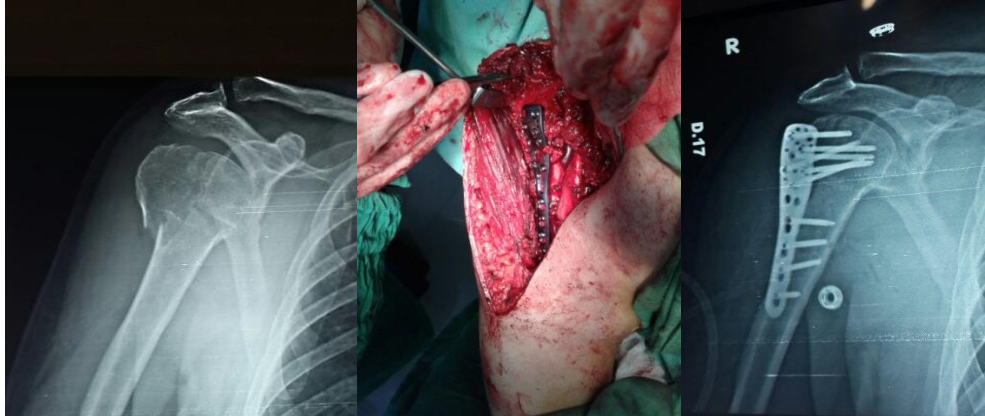
**Table:** Outcome in different types of fractures

TYPE	No of Patient	Average Age (years)	Oxford score	DASH score	Complication
2 Part	9	57.7	32.2	34.2	0
3 Part	11	66.2	23.2	20.8	0
4 Part	7	64.4	28.4	24.2	3



Pre operative X ray

Post operative x ray



Pre, intra and postoperative pictures

Staphylococcus aureus was the organism. In remaining patient unions was achieved within usual time period. There were two other complication in our series, in one patient one screw became loose and the implant was removed at 6months. Another complication noted was a case of frozen shoulder which was manipulated twice under general anesthesia. Male patients achieved better outcome as compared to female with an average of Oxford score 30.2 (range 50-13) and an average DASH score 27.4 (Range 0-56.2) compared to 32.1(range 13to 59) and 34 range (0-89.2), All the three complication that occurred were in female patient group. Seven patients had 2 part fracture, 11 had 3 part and 9 had 4 part fractures. The 3 and 4 part fracture was more common in elderly patient above 60year age. All the complication occurred in 4-part fracture pattern. Out of the 27 patients 13 were above 60 and 14 were below 60years of age. Young patients final outcome was better than elderly patients in terms of oxford score (29 v 32) and DASH score (26.6 V 38.4) scoring system.

## DISCUSSION

Proximal humerus fractures can be managed conservatively in a sling; percutaneous k wire fixation and ORIF with different implants [10]. Proximal humerus fractures are common both in young age group as well as in old age group. In fragile osteopenic patients, particularly females the bone quality and co morbidities complicate the situation and a conservative approach is always a safe and viable option in these patients [11, 12]. Zyto and colleagues reported good result with non operative method as compare to surgical option [13] Percutaneous pinning has limitation of improper reduction, skin problems and difficulty in early mobilization [14]. PHILOS plating is

now considered treatment of choice in osteoporotic bones because there are multiple screws in different directions [15]. In our study all patients showed satisfaction with the treatment given except one patient who had infection, non-union and failure. In our study 26 out of 27 patients the fracture healed within average 12.3 weeks. One of our patients got infected followed by implant removal and non-union. Almost all patients had excellent results and functional outcome interms of Oxford and DASH scores.

## CONCLUSION

PHILOS plating in fractures of proximal humerus has the good results particularly in the osteoporotic bones.

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