ISSN: 0975-3583,0976-2833 VOL14, ISSUE2, 2023

Original Research Article

To evaluate functional outcome during PHILOS Plating for treatment of displaced proximal humerus fractures

Dr Prant Gupta[1] (PG Resident 2nd Year), Dr. Akash Jamra[2] (PG Resident 2nd Year) & Dr. Abhishek Chaturvedi[3] (Senior Resident)

Dept. of Orthopaedics, Gajra Raja Medical College, Gwalior, M.P.[1,2&3]
Corresponding Author: Dr. Akash Jamra

Abstract:
Background & Method: The aim of present study is to evaluate intraoperative technical difficulties during PHILOS Plating for treatment of displaced proximal humerus fractures. Proximal humerus fracture were attended in casualty and OPD and were admitted. After the patient with proximal humerus was admitted to the hospital, all history and clinical details were recorded in history sheet according to planned proforma. Radiographic evaluation was done and fractures were classified according to Neer's classification.
Result: 57% patients had two part fracture of proximal humerus which was the most common type in our study. Right side was involved in more patients. 34 patients had right side involved. In our patients, treated by PHILOS plating most common complication was varus malunion and least common complication was implant failure.
Conclusion: Functional Outcome is better and earlier in Younger Patients. Although outcome is also good in elderly. Age and fracture configuration play a significant role in the clinical outcome of these fractures after internal fixation. Complications may be related to inappropriate surgical technique or fracture geometry. Those related to surgical technique are preventable and include improper fracture reduction, screw placement, improper plate placement leading to impingement, excessive soft tissue stripping of the fracture fragments predisposing to avascular necrosis and occasional neurovascular injury.

Keywords: intraoperative, PHILOS, Plating, & fractures.

Study Designed: Observational Study.

1. INTRODUCTION

Hippocrates first documented a proximal humerus fracture in 460 BC and treated it with traction. In 1869, to improve treatment, Krocher classified fractures of the proximal humerus. In 1934, Codman developed a classification that divided the proximal humerus into 4 parts, based on epiphyseal lines[1]. In 1970, Neer's classification expanded on the 4-part concept and included anatomical, biomechanical, and treatment principles, providing clinicians with a useful framework to diagnose and treat patients with these fractures[2].
Most are stable and minimally displaced and can be treated nonn-operatively with good results. Dispplaced and unstable fractures are difficult to manage and have a high morbidity[3]. Treatment goal is restoring articular anattomy and its relationship to the tuberosities while at the same time maintaining the vascular integrity of the humeral head so that better functional outcome of the shoulder could be achieved[4].

ISSN: 0975-3583,0976-2833 VOL14, ISSUE2, 2023

Recent trend in internaal fixation has moved on to proximal humerus locking plate. PHILOS plates are pre-shaped and pre-contoured locking compression plates. Pre contoured loocking plates work on the principle of anguular stability, less disruption of vasscularity, and less chances of plate failuure & early mobilization[5].

2. MATERIAL & METHOD

This is a Prospective study carried out at Department of Orthopaedics, Gajra Raja Medical College, Gwalior, from Jan 2022 to Dec 2022. 60 patients of proximal humerus fracture were attended in casualty and OPD and were admitted. After the patient with proximal humerus was admitted to the hospital, all history and clinical details were recorded in history sheet according to planned proforma. Radiographic evaluation was done and fractures were classified according to Neer's classification.

Fractures were classified according to the Neer's classification [26]. The Neer's classification of proximal humeral fractures is probably the most frequently used along with the AO classification of proximal humeral fractures.

The two main components of the classification are

1. Number of fracture parts
2. Displacement of fracture parts

Neer's system divides the proximal humerus into 4 parts and considers not the fracture line, but the displacement as being significant in terms of classification.

The Inclusion criteria of the study:

1. All skeletally matured patients aged 18 years and above.
2. Patients presenting with displaced proximal humerus fractures with dislocation of shoulder joint.

After the patients with proximal humerus fractures were admitted to the hospital, all the clinical details were recorded in history sheet comprising of:

1. Name, Age & sex of the patient.
2. History of trauma (mode of trauma, place & time of injury).
3. Time interval between injury and treatment in our department.

3. RESULTS

Table No 1: Age incidence

Age group (years)	Number of patients	Percenntage
18-30	08	13%
31-40	10	17%
41-50	10	17%
51-60	20	33%
61-70	12	20%

ISSN: 0975-3583,0976-2833 VOL14, ISSUE2, 2023

Age variation in series was from 18 to 70 years. Proximal humeerus Fracture was found to have high incidence in 51 to 70 years age group**.**

Table No 2: Laterality

Side	**No. of Patients**	**Percentage**
Right	34	57%
Left	26	43%

Right side was involved in more patients. 34 patients had right side involved.

Table No. 3: Classification type

Classification type	**Number of cases**	**Percentage**
Two Part	34	57%
Three Part	18	30%
Four Part	08	13%

57% patients had two part fracture of proximal humerus which was the most common type in our study.

Table No. 4: Complications

Classification type	**Number of cases**	**Percentage**
Joint stiffness	04	6.7%
Implant failure(Pull out of screws, implant breakage)	Nil	Nil
Primary and secondary screw perforations	04	6.7%
Sub acromial impingement	02	3.3%
Avascular necrosis of humeral head	04	6.7%
Infection	02	3.3%
Varus Malunion	06	10%
Non-union	Nil	Nil

In our patients, treated by PHILOS plating most common complication was varus malunion and least common complication was implant failure.

4. DISCUSSION

Most of other studies had reported good functional outcomes and recommended the use of locking plates for proximal humerus fractures especially in elderly patients with poor bone quality. This leads us to believe that application of locking plate technology for proximal humerus fractures has a steep learning curve and appropriate surgical technique is very important for achieve good functional outcome.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE2, 2023

In our study, the mean Constant score for 4-part fractures was 65.5 which were inferior as compared to 2-part and 3-part fractures (81.8 &70.7 respectively). Our result was comparable to the one prospective study conducted by Aggarwal et al.[6] in which the mean Constant score for 4-part fractures was significantly inferior to other types. The results of two studies indicated an advantage in functional outcomes favouring shoulder hemiarthroplasty compared with ORIF with a locking plate in 4-part fracture [7]. These results are expected as these fractures are more complex and open reduction and internal fixation is tougher.

We found difference in outcome between patients of age group less than or more than 50 years of age. Patients less than 50 years of age group showed better response. Similar findings had been reported by Aggarwal et al. [6] who found the Constant scores to be higher in younger patients as compared to older patients. Rizwan Shahid et al. (2008)[8] concluded that PHILOS plate were equally good in all the patients but the functional outcome was better in younger patients. However Rajinder Singh Gaheer(2010)[9] found No differences in the functional outcomes of patients younger and older than 65 years.

Post operatively, various complications were observed. A varus malunion was observed in 3 patients (10%) and was found to be the commonest complication in our study. Varus malunion was found in five out of 47 patients in one study. These patients had been fixed in a varus position and had an insufficient medial buttressing leading to poor outcome. One patient had associated avascular necrosis of humerus head leading to poor outcome. We did not observe any valgus malunion in our study. We thus found that a varus malalignment was causing loss of fixation with poor outcome and must be avoided intra-operatively at any cost. In our study we attempted to achieve correct anatomic reduction of the fragments but still had a high percentage of patients with this complication.

5. CONCLUSION

Functional Outcome is better and earlier in Younger Patients. Although outcome is also good in elderly. Age and fracture configuration play a significant role in the clinical outcome of these fractures after internal fixation. Complications may be related to inappropriate surgical technique or fracture geometry. Those related to surgical technique are preventable and include improper fracture reduction, screw placement, improper plate placement leading to impingement, excessive soft tissue stripping of the fracture fragments predisposing to avascular necrosis and occasional neurovascular injury.

6. REFERENCES

1. Bjorkenheim JM, Pajarinen J, Savolainen V. Internal fixation of proximal humeral fractures with a locking compression plate: a retrospective evaluation of 72 patients followed for a minimum of 1 year. Acta Orthop Scand 2004; 75:741-5.
2. Koukakis A, Apostolou CD, Taneja T, Korres DS, Amini A. Fixation of proximal humerus fractures using the PHILOS plate: early experience. Clin Orthop 2006; 442:115-20.
3. Kettler M, Biberthaler P, Braunstein V, Zeiler C, Kroetz M, Mutschler W. Treatment of proximal humeral fractures with the PHILOS angular stable plate. Presentation of 225 cases of dislocated fractures. [Article in German] Unfallchirurg 2006; 109:1032-40.
4. Koukakis A, Apostolou CD, Taneja T, Korres DS, Amini A. Fixation of proximal humerus fractures using the PHILOS plate: early experience. Clin Orthop Relat Res 2006;(442):115-20.
5. Moonot P, Ashwood N, Hamlet M. Early results for treatment of three- and four-part

ISSN: 0975-3583,0976-2833 VOL14, ISSUE2, 2023

fractures of the proximal humerus using the PHILOS plate system. J Bone Joint Surg Br. 2007;89(9):1206-1209.
6. Aggarwal S, Bali K, Dhillon MS, Kumar V, Mootha AK. Displaced proximal humeral fractures: An Indian experience with locking plates. J OrthopSurg Res 2010;5:60.
7. Sproul RC, Iyengar JJ, Devcic Z, Feeley BT. A systematic review of locking plate fixation of proximal humerus fractures. Injury. 2011;42(4):408-13.
8. Rizwan Shahid, Abid M Ushtaq, Julian N Orthover, Mohammad Maqsood. Outcome of proximal humerus fractures treated by PHILOS plate internal fixation Experience of a District General Hospital. ActaOrthop. Belg. , 2008, 74 , 602-608.
9. Gaheer RS, Hawkins A.Fixation of 3- and 4-part proximal humerus fractures using the PHILOS plate: mid-term results. Orthopedics. 2010 Sep 7;33(9):671.