

International Journal of Orthopaedics Sciences

E-ISSN: 2395-1958 P-ISSN: 2706-6630 IJOS 2021; 7(1): 386-388 © 2021 IJOS www.orthopaper.com Received: 23-10-2020 Accepted: 02-12-2020

Dr. Sudipta Biswas

Junior Resident, Department of Orthopaedics, Kalinga Institute of Medical Sciences, Bhubaneswar, Odisha, India

Dr. SP Das

Assistant Professor, Department of Orthopaedics, Kalinga Institute of Medical Sciences, Bhubaneswar, Odisha, India

Dr. Amlan Dash

Senior Resident, Department of Orthopaedics, Kalinga Institute of Medical Sciences, Bhubaneswar, Odisha, India

Dr. Arfaz Siddique

Junior Resident, Department of Orthopaedics, Kalinga Institute of Medical Sciences, Bhubaneswar, Odisha, India

Corresponding Author: Dr. Sudipta Biswas Junior Resident, Department of Orthopaedics, Kalinga Institute of Medical Sciences, Bhubaneswar, Odisha, India

Functional outcome of different treatment modalities of proximal humerus fracture (3 part and 4 part)

Dr. Sudipta Biswas, Dr. SP Das, Dr. Amlan Dash and Dr. Arfaz Siddique

DOI: https://doi.org/10.22271/ortho.2021.v7.i1g.2513

Abstract

Introduction: Proximal humerus fracture is the most common fracture of humerus consisting 45% of all humerus fracture and second most common fracture in upper extremity. Diagnosis and proper management of proximal humerus fracture is important as the shoulder joint needs a high demanding function for daily activities. Various treatment options available for proximal humerus fracture from conservative management, K wire fixation, ORIF and plating, hemiarthroplasty to Reverse Shoulder arthroplasty.

Aims and Objective: Our study aimed to evaluate the one year follow up results of different treatment modalities in a perspective series of proximal humerus fracture and study complication, if any involved with these modalities and to find out the basis of selecting the mode of treatment of proximal humerus fracture to bring out the best functional outcome.

Materials and Method: 40 patients with displaced proximal humerus fracture (3 part and 4 part) treated between September 2018 to August 2019 were included in this study. Out of 40 patients in our study 32 patients have 3 part and 8 patients have 4 part fracture. 33 patients (3 part-27, 4 part-6) treated with PHILOS plating. 3 patients (All 3 part) treated with K wire fixation. 2 patients (All 3 part) treated by Reverse Shoulder Arthroplasty. The functional outcome has been assessed by Constant-Murley shoulder scoring system.

Results: Out of 40 cases 10(25%) patients had excellent result, 21(52.5%) good, 8(20%) moderate and 1 (2.5%) patient show poor outcome. There are few complications in our study-Malunion (3 patients), nonunion (2 patients), Joint stiffness (1 patient), Instability (1 patient), Heterotropic Ossification (1 patient), AVN of humeral head (2 patients).

Conclusion: From this study we found that PHILOS is an effective treatment for 3 part fracture and for 4 part fracture Reverse Shoulder Arthroplasty is appears to be better option.

Keywords: Proximal humerus fracture, Deltopectoral approach, PHILOS plate (proximal humerus internal locking system), Reverse Shoulder Arthroplasty, Avascular necrosis of humeral head

1. Introduction

Proximal humeral fractures account for about 4 to 5% of all fractures. It accounts for up to 45% of all humeral fractures. It is the third most common fracture after hip fracture and colles fracture in elderly patients. It is important to recognize these fracture early. Numerous authors have suggested that non operative treatment can be acceptable for three and four part fractures of proximal humerus in elderly patients but pain, stiffness, loss of function and muscle power have been described in more percentage of patients following this conservative approach. Fractures of Proximal Humerus have gained more attention recently. Diagnosis has been facilitated with adaptation of 3-right angle trauma series X-rays supplemented with CT or MRI. With more standard use of Neer's 4-part Classification system for fracture and fracture dislocation, a protocol for management and comparision of long term outcome of similar injuries has been made possible. Emphasis is placed on complete and accurate diagnosis and formulation of safe and simple standard techniques for fracture realignment, restoration of anatomic stability, fracture healing, cuff integrity, regaining movement and function. There have been improvements in fixation techniques and in the understanding of the role of prosthetic replacement to maximise anatomic restoration and minimising immobilisation time, during which period stiffness usually develops. The elderly people no longer need to be denied effective surgical treatment, especially at a time in life, when the shoulders are often needed

for ambulation with canes and crutches. Maintenance of good shoulder function will surely make a good difference to their independent life style. In this study we have analysed the functional and radiological outcome of forty (40) cases of proximal humeral fractures treated with conservative management, K wire fixation, PHILOS plate and RSA.

2. Materials and Method

A prospective observational study was conducted in the Department of Orthopedics at KIMS and PBMH, Bhubaneswar, Odisha, after obtaining permission from ethical committee among patients admitted under orthopeadics in period from September 2018 to August 2019 and follow up for minimum 1 year. The study has been done on 40 patients. We have excluded Patient younger than 18 years, Proximal humerus fractures involving shaft of humerus, Undisplaced fracture, Two part greater tuberosity and lesser tuberosity fractures, Polytrauma cases, Pathological fractures, Proximal humerus fracture with nerve injury, Old fractures and compound fractures. After initial resuscitation a detailed history was taken and thorough clinical examination done to rule out any other associated injuries. Distal neurovascular status was assessed. Radiographs of the affected shoulder were taken in AP, Lateral and Axillary views and fractures were classified according to Neer's classification. CT scan were taken in selected patients with complex fracture patterns to know the articular involvement. Out of 40 patients in our study 32 patients have 3 part and 8 patients have 4 part fracture. Out of 32 patients of 3 part fracture 27 treated by PHILOS plating, 3 patients were treated by K wire fixation and 2 patients were treated conservatively as they had comorbidities and high risk candidate for general anaesthesia. Out of 8 patients of 4 part fracture, 6 patients were treated by PHILOS plating and 2 patients underwent Reverse Shoulder Arthroplasty. All operative patient underwent general anaesthesia. Patient operated with ORIF and plating, surgical approaches were standard deltopectoral approach or deltoid splitting approach. For patient treated with reverse shoulder arthroplasty, the approach was deltopectoral approach. X rays are taken in the immediate post op period to document the fracture alignment, reduction and fixation. There after X rays are repeated at every 1 month interval to monitor the fracture union and to detect any implant loosening, deviation, screw penetration, screw backout, impingement and failure.

3. Results

In our study there was male preponderance 24 (60%) and female 16(40%). The age group of the patients ranged from 18 to 70 yrs with mean age of 46 years. Most common mode and mechanism of injury was free fall at ground level followed by RTA. Two patients in our study had unusual mode of injury like convulsion. Thirty two patients presented to us within five days after injury and 10 patients had previous treatment either in the form of native splinting, massage or POP application. The average clinical union time was approximately 10 weeks. 1 patient with diabetes mellitus undergone PHILOS plating developed wound gaping due to infection requiring secondary suturing after glycaemic control. 1 patient with 4 part fracture undergone RSA developed skin necrosis which resolved with intravenous antibiotics. 1 patient had deltoid atony after PHILOS which improved with sling and strengthening exercises. Late complications were encountered in 10 (25%) patients. 3

patients with 3 part fracture had malunion, restricting abduction above 90°. (1 PHILOS, 1 K wire fixation and 1 conservative). The patient who had deltoid atony initially after surgery had mild inferior instability which was not incapacitating for the patient. 1 Patient undergone PHILOS had joint stiffness. Later required manipulation under general anaesthesia.1 patient of PHILOS developed Heterotopic ossification with 3 part fracture, probably because the patient had exercised native treatment in the form of many attempted reduction, massage and splinting before the surgery. 2 patients had non-union, out of this 1 three part fracture treated conservatively and the other one was 4 part fracture treated with PHILOS. 2 patients of four part fracture develop AVN of humeral head treated with PHILOS. Of these 40 cases 10(25%) patients had excellent result, 21(52.5%) good, 8(20%) moderate and 1 (2.5%) poor outcome by Constant Murley scoring system.



Fig 1: Overall Results



Fig 2: Pre-Operative X Ray



Fig 3: Intra Operative PHILOS Plate Fixation



Fig 4: Immediate Post Op X Ray



Fig 5: Months follow up

4. Discussion

Proximal humerus fractures account for about 4-5% of all fractures. It accounts for upto 45% of all humeral fractures. It is the third most common fracture after hip fracture and colles fracture in elderly patient. It is important to recognize these fractures early.

Various methods that are available are close reduction, plaster splint and cast, percutaneous K wire fixation, open reduction and internal fixation and prosthetic replacement. The ultimate goal of the treatment of all fractures is making patient return to usual daily activities as soon as possible and to as nearly normal function. The aim of this study to evaluate the long term results of different treatment modalities in a prospective series of proximal humerus fracture and to find out the basis of selecting the mode of treatment of proximal humerus fracture to bring out the best functional outcome. In this prospective study we have analysed 40 cases of Proximal Humerus Fractures treated with PHILOS plates, Reverse Shoulder Arthroplasty, K wire fixation, Conservative method in our hospital. In our study there was male preponderance 24 (60%) and female 16(40%). In our study the average age of the patients was 46 years which is corresponding to the reports by Hawkins, Bell and Gurr and Flatow et al. and Cornell CN, Levine DS, Pagnani MJ. In our study, the most common mode and mechanism of injury was free fall at ground level followed by RTA, were much comparative to the results of the study conducted by Flatow et al. as fall on the outstretch arm was predominant mechanism of injury. Also in our study, unusual mode of injury like seizures was present in two patients supported by B Kristiansen and S Christensen. In order to properly employ Neer's classification, precise radiographic evaluation is of paramount importance. We have found the Neer's three view trauma series to be of greatest value in evaluating the fractures.

X ray was taken for all patients. Computed tomographic scan

was done in 10(25%) patients who had articular involvement. There was a predominance of three part fracture in our study (80%), of which greater tuberosity 3 part fractures. Out of 32 patients of three part fracture, 27 patients treated with PHILOS plating, 3 patients treated with K wire fixation and 2 patients managed conservatively. Out of 8 patients of four part fracture, 6 patients treated with PHILOS plating and 2 patients treated with Reverse Shoulder Arthroplasty. 3 patients had early complications of skin necrosis, wound gaping and deltoid atony. We have seen few late complications in our study. All fractures united and the average time taken for union was approximately ten weeks. Three patient with three part fracture went for malunion. No cases of implant deviation, screw penetration, screw back out, impingement and failure was encountered. Malunion of greater tuberosity fragment in a patient with 3 part fracture treated with PHILOS plate resulted in restriction of abduction and impingement. In this patient poor radiological outcome lead to poor functional outcome as well.

Some patients despite having malunion may have a good functional capacity reflecting the fact that radiological outcome may not imply functional outcome. Heterotopic ossification occurred in one patient with 3 part fracture, probably because the patient had exercised native treatment in the form of many attempted reduction, massage and splinting. The overall results of our study show, 10(25%) patients have excellent functional outcome, 21(52.5%) patients have good functional outcome, 8(20%) patients have moderate and 1(2.5%) patient has poor functional outcome.

5. Conclusion

Treatment of displaced proximal humerus fractures can be quite challenging and the management options have been controversial as several modalities of treatment exist. In our study we have concluded that 3 part fracture of proximal humerus have been successfully treated with ORIF and PHILOS plating with good to excellent functional outcome. But PHILOS plating is found be less appropriate for the management of 4 part proximal humerus fracture as there is high chance of AVN of humeral head and non-union requiring shoulder arthroplasty.

Reverse Shoulder Arthroplasty was found to be an effective treatment in 4 part proximal humerus fracture with an excellent functional outcome.

6. References

- 1. Neer CS. Displaced proximal humerus fracture part 1; Classification and evaluation: J bone and joint Surg. Am 1970;52(6):1077-89.
- 2. Martinez AA, Janenca A. Herrera, PHILOS plate fixation for proximal humerus, Journal of Ortho surgery 2009;17(1):4-10
- 3. Neader Helmy MD, Beat Hintermann MD. New trends in treatment of proximal humerus fracture. CORR 2006;442:100-108.
- 4. Ranawat CS, Warren R, Inglis AE. Total shoulder replacement arthroplasty. Orthop Clin North Am Apr 1980; 11(2):367-373.
- 5. Rose PS, Adams CR, Torchia ME, Jacofsky DJ, Haidukewych GG. Steinmann SP. Locking plate fixation for proximal humeral fractures; initial results with a new implant. J Shoulder Elbow Surg 2007;16(2):202-207.
- 6. Scott E Powell, Joseph D Zuckermann, Frances Cuomo, Debra Newmann, Maureen Gallagter. 3 Part Proximal Humeral Fractures: A Prospective study of Functional Outcome: AAOS; Annual Meeting; Scientific Program; Paper No. 330 1992.