

Original research article

The functional outcome following proximal humeral interlocking system (PHILOS) plating for displaced proximal humeral fractures by evaluating pain, range of motion & muscle power

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Abstract

Approximately 80-85 percent of proximal humeral fractures were treated non-operatively, resulting in good functional results. Where it is noted that significant displacement was associated with poor functional outcome, especially in comminuted fractures, as in the 15% to 20% of displaced proximal humerus fractures, thus moving to surgical fixation for better results. In the proposed study a minimum of 30 cases presenting with proximal humeral fractures were evaluated clinically and radiologically. The fractures were classified by using Neer's classification.

Routine investigations will be carried out in order to get fitness for surgery. Consent of the patient will be taken. The final results are evaluated by using NEER'S Score. In our study the minimum score was 72 and maximum of 94. The average score is 82.93. We had excellent results in 7 (23%) of patients, 14(46%) had satisfactory results, 9(30%) patients had unsatisfactory results but none of the case is failure in our study.

Keywords: Philos, neer's score, displaced proximal humeral fractures

Introduction

Proximal humerus fractures are common and debilitating injuries and incidence of them are increasing especially in elderly. They accounts for about 5% of all injuries to appendicular skeleton ^[1]. They are the third most common fractures in elderly population after hip and distal radius fractures. Increase in incidence is due to more geriatric population with osteoporosis in aged population and increasing incidence of higher velocity injuries, Increasing incidence of road traffic accidents, natural disasters and industrial accidents, together with assault lead to multiple fractures and higher incidence of morbidity in young patients.

Most of the proximal humeral fractures were treated by non-operative methods in the past century ^[2], approximately 80-85 percent of proximal humeral fractures were treated non-operatively, resulting in good functional results. Where it is noted that significant displacement was associated with poor functional outcome, especially in comminuted fractures, as in the 15% to 20% of displaced proximal humerus fractures, thus moving to surgical fixation for better results ^[3]. Nevertheless, considerable debate persists over the best

methods for treating displaced proximal humerus fractures ^[4] Over the last 3 decades, multiple fixation modalities have emerged for proximal humerus fractures (transverse suturing, percutaneous pinning, pressure band welding, plating, rush nailing, arthroplasty). The implant of this proximal humerus locking plate is now the alternative for the treatment of displaced proximal humerus fractures as they provide rigid anatomical closure and greater angular stabilization, thereby enabling early mobilization and good functional limb ^[5, 6].

Methodology

In the proposed study a minimum of 30 cases presenting with proximal humeral fractures were evaluated clinically and radiologically. The fractures were classified by using Neer's classification.

Routine investigations will be carried out in order to get fitness for surgery. Consent of the patient will be taken.

Once the patient is fit for surgery, will under goes open reduction and internal fixation with proximal humerus interlocking system (PHILOS) plate and screws under brachial plexus block or general anesthesia, Patient will be placed in Beach chair. All the patients were approached by Deltopectoral approach, cephalic vein is dissected and retracted, internervous plane between deltoid and biceps tendon. Once fracture site is exposed, fracture is reduced provisionally with K wires and checked in fluoroscopy. And final fixation done with PHILOS plate and position is confirmed in fluoroscopy.

Post-operatively limb is immobilized in arm pouch; mobilization was started in the second week with pendulum exercises as per patient's tolerance. Immediate post-op X-Rays were done routine A-P and scapular view to assess the reduction of fracture and stability of fixation. Most of the suture removal was done on 10-12th day. Patients were discharged with arm pouch and advise to continue pendulum exercises. Patients were followed from 6 weeks - 1 year on OPD basis at intervals of 6 Weeks, 12 Weeks, 6 Months and 1 year. During this period in each visit clinical evaluation of wound healing, pain, shoulder function and range of movements were assessed and recorded. Anatomy of the fracture was assessed by radiographs. Fractures were assessed for clinical and radiological union. Clinically fracture was consider united when there was no complaints from patients like residual pain, sense of insecurity, no tenderness, at the fracture site or full function of shoulder.

Radiologically fracture was regarded as united when there is no visible fracture line. Results were evaluated by the use of Neer's shoulder score based on pain, function, range of motion and anatomy for each case assessed and recorded.

Results

In our study, we observed that the average time taken for fracture to unite is 12 weeks. In 8 of 30 patients it is 10weeks, among 12 patients it took 12 weeks, in 8 patients 14 weeks took to unite and in another 2 patients 16 weeks taken.

Table 1: Time taken for union

Time taken for union	No of cases
10 weeks	8
12 weeks	12
14 weeks	8
16 weeks	2

During the follow up period 4 patients had developed shoulder stiffness (13%), one patient had plate impingement (3%). 2 patients (6%) developed superficial surgical site infection,

which was managed with debridement and Antibiotics which eventually healed uneventfully. There were no incidences of non-union and osteonecrosis of the proximal humerus in our study.

Table 2: Complication

Complication	No of cases
Shoulder stiffness	4
Plate impingement	1
Surgical site infection	2

The final results are evaluated by using NEER'S Score. In our study the minimum score was 72 and maximum of 94. The average score is 82.93. We had excellent results in 7 (23%) of patients, 14(46%) had satisfactory results, 9(30%) patients had unsatisfactory results but none of the case is failure in our study.

Table 3: Grading

Grading	No of cases
Excellent	7
Satisfactory	14
Unsatisfactory	9
Failure	0

Discussion

One patient had plate impingement and limitation of abduction, its hardware related complication and improper plate positioning may have led to impingement. 4 patients had shoulder stiffness leading to unsatisfactory results and all of them were elderly; stiffness is more of surgical complication than implant. These results are consistent with other studies too.

Table 4: Complications

	Ramchander Siwach ^[7]	Richard J Hawkins ^[8]	Our study
Shoulder Stiffness	00	00	04
Surgical site infection	01	00	02
Plate impingement	01	02	01
Mal union	01	00	00
Non union	02	00	00
AVN	02	02	00

In our study final functional outcome is assessed with NEER'S score. 7 (23%) of 30 patients had excellent results, 14 (46%) had satisfactory results and 9 (30%) had unsatisfactory results. All cases of unsatisfactory results were had complication and elderly patients. None of patients in our study were failure. These results are consistent with other studies too ^[10].

Table 5: Outcome

Study	Excellent	Satisfactory	Unsatisfactory	Failure
AA Martinez et al ^[9]	13(22.4%)	36(62%)	08(13.8%)	1(1.7%)
Richard J Hawkins ^[6]	08(53.3%)	06(40%)	00	01(6.7%)
Our study	07(23%)	14(46%)	09(30%)	00

Conclusion

Osteosynthesis with open reduction and internal fixation with Proximal Humerus Interlocking System (Philos) Plate has given satisfactory results.

Operative management yields good functional results in proximal humeral fractures in adult's b/n 20-40 years with fewer complications. These patients responded well to the rehabilitation programme than their older counterparts.

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