



Outcomes in patients of fracture of surgical neck humerus treated with proximal humerus inter-locking osteosynthesis (PHILOS) plate fixation

KEYWORDS

PHILOS plate, DASH score, UCLA score, surgical neck humerus fracture

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ABSTRACT *Though Hippocrates was first to describe fractures of upper end of humerus, it took us 20 centuries before Neer gave us a possible explanation regarding various aspects of these fractures and also a protocol for management of various types of these fractures. Now sitting on a mountain of information regarding pros and cons of various modalities of treatment, blood supply of head, trabecular pattern of head etc. we are in a place to study the efficacy of proximal humerus locking plate in the treatment of fracture of surgical neck of humerus. The purpose of this study is to specifically study the effect of patient age and fracture type on the outcome. Operated patients were assessed on the basis of UCLA and DASH score. Results of the operative treatment with open reduction and internal fixation (ORIF) using proximal humerus locking plates is very satisfactory.*

Introduction:

The shoulder joint was less commonly exposed to trauma before modernization but with modernization there also came the evils of increasing road traffic accidents and polytrauma thus increasing the incidence of shoulder injuries. Though Hippocrates was first to describe fractures of upper end of humerus, it took us 20 centuries before Neer gave us a possible explanation regarding various aspects of these fractures and also a protocol for management of various types of these fractures but the disheartening aspect of his study was that he had 100% failure with osteosynthesis in four part fractures, later workers reported better results if not good results, the proper management of this is yet to find the day light. The diagnosis and treatment of the proximal humerus fracture are challenging and difficult. Literature on proximal humerus fracture treatment is exciting considering the various types of the treatment given and the result claimed by various workers at different periods.

The proximal humerus consists of the humeral head, greater tuberosity, lesser tuberosity, bicipital groove and proximal humeral shaft. Surgical neck lies below the epiphyseal line and is a common site for fracture. It is related to axillary nerve and anterior and posterior circumflex humeral vessels. Its fracture is mainly classified by neer's classification.

Proximal humerus locked plate-PHLP is precountered and anatomically shaped plate for proximal humerus and has five holes in the section abutting the head. These locking screw holes are variedly directed as to improve the fixation. The first two holes are slanting at an angle of 95° to the plate and are inclined slightly upwards; these screws ascend in the head. The next row also has two screw holes that are at 90° to the plate and at angle of 50° to one another, spreading out in the head. The fifth hole is an integrated hole and is set at an angle of 90° to the plate. This portion of the plate is bent upwards so the screws ascend in the head. The proximal section also has several holes of 2 mm diameter through which sutures are passed to repair and stabilize the rotator cuff. These holes also serve as placement points for the aiming block. The block sits on the plate to guide the threaded drill sleeve and subsequently the drill bit to the perfect angle of screw insertion in the humerus head. Use of the aiming block

is mandatory when applying this plate.

Objective: To evaluate the results of PHILOS plating in different types of surgical neck humerus fractures both clinically as well as radiologically.

Materials and methods:

This is a study of 30 cases of proximal humerus fracture treated with open reduction and internal fixation of surgical neck humerus fractures using proximal humerus locking plate at Department of Orthopedics at a tertiary level government hospital between 2008 and 2010. Out of 32 cases 2 patients dropped out before their final follow-up. All patients were operated via deltopectoral approach of proximal humerus. As soon as the pain permitted, usually 3rd or 4th day post surgery, gentle shoulder mobilization exercises in form of pendulum exercise was started. After stitch line healed, all stitches were removed, shoulder abduction exercise was started and patient was discharged with advice of weekly follow-up for physiotherapy in physiotherapy department till maximum functional recovery was achieved.

Assessment standards:

- Range of motion of shoulder joint
- UCLA score
- DASH score

Observation and discussion:

This study was carried out at department of orthopedics at a government hospital during 2008 to 2010. A total of 32 patients were treated during this period & were called for regular follow up out of which 2 were not available for final follow up. Hence there were dropouts and the present series consists of 30 patients. Follow-up period was of minimum 6 months and maximum of 1 year.

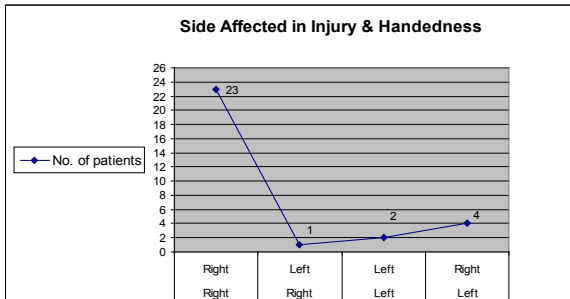
1. **Age:** The highest incidence (43.3%) was noted in the middle aged group between 31yrs to 50 yrs and 2nd most common (33.3%) were above 60 years of age. Mean age group in this study is 51 yrs. As middle aged persons are more active, they are involved in labour work & increasing road traffic accident makes them more susceptible to sustain this type of injury.

- Sex:** The fractures were more common among the males and the M:F ratio is 2.12:1. Such distribution pattern may be because females are having low functional demands in their life and they do not require heavy work in their routine daily life.
- Occupation:** Incidence was common among those who were involved in labour work as they are more prone to sustain such injury because of their occupation and most of the people who confined themselves to household were elderly, so osteoporosis, frequent fall downs makes them more susceptible to such injury.
- Mode of injury :** Commonest mode of injury in this series was fall on outstretched hand (63.2%) followed by accidents.
- Associated injury:** Though isolated injuries (80%) were more common but another fracture involving the same limb (13.3%) was also seen as an associated injury because most of the patient in this series had fall on shoulder/outstretched hand as a cause for the injury they sustained as a result of which they sustained fracture in same limb also.

6. Associated illness:

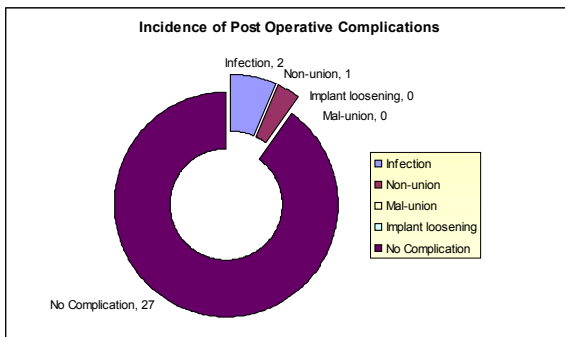
Illness	No. of patients	% of patients
Diabetes	1	3.3
HT	8	26.6
IHD	0	0
COPD	1	3.3
No illness	20	66.6
Total	30	100

7. Side affected and handedness:



- Neer's classification:** Neer's type II (43.3%) and type III (46.6%) are the most common fracture pattern and it requires operative treatment in the form open reduction and internal fixation.

9. Post operative complications:



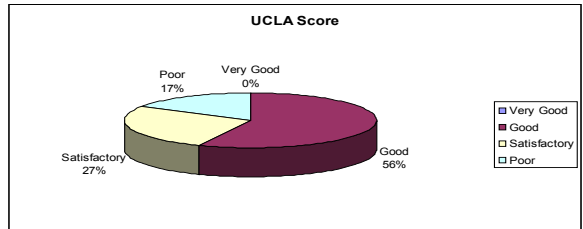
10. Range of motion:

Abduction: 70% patients had abduction of more than or equal to 90° which made their daily routine activities involving movement of upper extremity above the shoulder easier.

External rotation: 50 % patient had more than 30° external rotation.

Forward flexion: 36.6% patient had 90-120° forward flexion.

11. UCLA score:



11. DASH score: 90% had good to very good score.

Conclusion:

- With modernization of the society and increasing road traffic accidents, the males of middle aged group especially the labourers more prone to shoulder injuries.
- Incidence of shoulder injuries are not negligible amongst people of older age group who are confined to households and already having osteoporosis.
- Although isolated fractures of the surgical neck humerus are common but other fractures (lower end radius, clavicle, elbow injuries) in the same limb and injuries involving opposite shoulder must be ruled out.
- It is evident from the study that associated medical illness has some impact on the final outcome of the results due to delay in the management and per operative difficulties.
- Patients who started physiotherapy earlier in the post operative period regain activities involving use of upper extremity above the shoulder.
- Incidence of nonunion is very less with newer fixation devices and the incidence of infection reduced to a lower level due to skill of proper anatomical exposure and experience of the operating surgeon with newer techniques.
- Early rehabilitation after fixation in the form of physiotherapy with pendulum exercise as soon as the pain and healing of the wound permits and shoulder abduction exercises thereafter play very essential role to regain near normal muscle power & to make the patient to initiate their daily routine activities as soon as possible.

Score:	Constant-Murley (max. 100 points)	UCLA (max. 35 points)	DASH (max. 0 points)
Very good	86–100	34–35	0–20
Good	71–85	28–33	21–40
Satisfactory	56–70	21–27	41–60
Poor	< 55	< 20	> 61

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