

## Study of Philos Plate Osteosynthesis in Proximal Humerus Fractures in Adult

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### **Abstract:**

**Objectives:** To evaluate the results of philos plate in different types and severity of proximal humerus fractures both clinically and radiologically.

**Methods:** 51 patients with proximal humerus fracture were included in study, out of them four patients died and five were lost follow up. 42 patients were considered for final evaluation. Out of them 28 male and 14 female patients aged 20 to 70 years (mean 41.0) treated with locking plate. Patients were assessed for six months radiological, clinically and functionally using Neer's score and DASH score.

**Results:** According to Neer's classification fractures were classified into two part fracture (n=20), three part fractures (n=16) and four part fractures (n=6). At 6 month follow up 14 had excellent, 27 had good results and 15 had fair and 3 poor results. Only three patients had implant impingement which was removed at 8 month when fracture had united. No patient developed nonunion, implant failure, avascular necrosis or reflex sympathetic dystrophy like complication.

**Conclusion:** Philos plate achieves favorable biological fixation for proximal humerus fractures with few complication. Even with osteoporotic bones no screw loosening seen. The outcome primarily depends upon patient's age, severity of the injury, bone quality and early post-injury intervention, good surgical technique and anatomical reduction, stable biological fixation and early postoperative mobilization.

**Key Words:** Philos, proximal humerus fracture

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### **I. Introduction**

Proximal humerus fractures are one of the commonest fractures occurring in the skeleton. They account for approximately 4 – 5% of the fracture attendance at the hospital. They occur more commonly in elderly patients with osteoporosis. Because of increasing incidence of high velocity trauma, complicated fracture pattern in proximal humerus are becoming increasingly common even in younger population. These fractures can be extremely disabling and their management often demands experienced surgical skills. The object of the osteosynthesis is to reduce the displacement (usually rotation) of each fragment and hold it in place with an implant.

Aim of this study was to assess and compare the results of PHILOS in fracture of proximal humerus both clinically and radiologically and come to conclusion about outcome and complications of PHILOS in proximal humerus fractures according to the pattern of fracture and patient selection.

### **II. Methods**

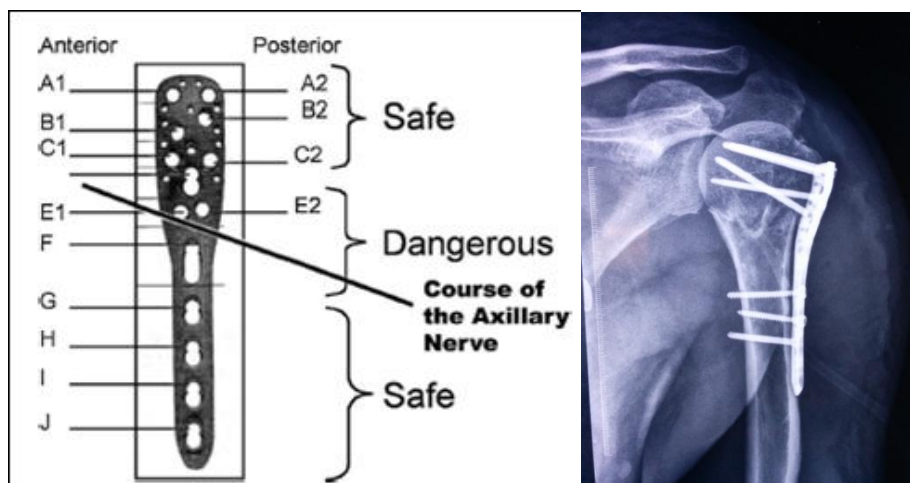
This study was carried out in CIVIL HOSPITAL, AHMEDABAD from May. 2012 to November 2014, I have included forty patients of proximal humerus fractures after applying inclusion and exclusion criteria.

#### **Inclusion criteria:**

- A] Adults patients
- B] Proximal humerus fractures complex variety. [Neer's classification: grade 3 to grade 4].

#### **Exclusion criteria:**

- A] Medically unfit patients.
- B] Fractures in pediatric age group.
- C] Shaft humerus fractures with proximal extension.
- D] Neer's one part fracture
- E] Open fractures
- F] Neurovascular injuries



**Sample size: 42 patients.**

After the patients with proximal humerus were admitted all the necessary clinical details were recorded in a trauma sheet. (Annexure 1) Radiographic evaluation of the shoulder was done according to Neer’s trauma series which consists of:

- Anteroposterior (AP) view of the scapula,
- Axillary view.

Fractures were classified according to the Neer’s classification and patients were shifted to the ward after initial temporary immobilization with Universal shoulder immobilizer. All the routine investigations were done on all the patients pre-operatively with complete medical and anesthetic fitness of patient for surgery. All patients were given 2 g cloxacillin (Ekvacillin, AstraZeneca, Södertälje, Sweden) preoperatively, followed by 2 additional doses during the first 24 hours

Internal fixation with a locking plate was performed in a modified beach-chair position utilizing a deltopectoral approach and with the aid of an X-ray image intensifier. The Philos® plate (Synthes, Stockholm, Sweden) was used in all patients. This plate is anatomically shaped and is recommended to be placed at least 8 mm distal to the upper end of the greater tubercle (rotator cuff insertion) and slightly dorsal to the long head of the biceps. It allows 9 locking screws in the proximal fragment and is available in different lengths allowing either locked or non-locked screws in the shaft. Fractures of the lesser and/or greater tubercle with displacement and/or instability were fixed with non-absorbable sutures.

After surgery the arm was placed in a sling and all patients were referred to a physiotherapist. The sling was used for 4 weeks and after that the patients were allowed to use it at their own convenience. Pendulum exercise and passive elevation/abduction up to 90 degrees were started from the first postoperative day and after 4 weeks the patients were allowed a free active range of motion (ROM). Strengthening exercises were begun after 3 months.

**Follow-Up**

The patients were first followed up at 2 weeks for stitch removal; then at 6 weeks to assess the progress of rehabilitation, detect any early complication and for removal of implants. Then after, patients were regularly followed up at 3 months and 6 months intervals. On each visit, patient is evaluated for following parameters.

**Clinical**

- Constant Shoulder Score
- Return to Pre-injury Activity-Personal
- Return to Pre-injury Activity-Professional

**Radiological**

Signs of Union

If any complication was noticed, it was managed accordingly.

Once a patient had regained the pre-injury status in both personal and professional aspects, the final follow-up of the patient was done. Final Constant Shoulder scores<sup>2</sup> were obtained. Standard AP and axillary radiographs were taken to evaluate:

- Joint Status

- AVN head of humerus
- Arthritis of head
- Head shaft angle

The final results were classified into four categories: Excellent, Good, Fair and Poor according to following final scores.

### III. Results

According to Neer's classification fractures were classified into two part fracture (n=20), three part fractures (n=16) and four part fractures (n=6). Only 5 out of 42 (11.90%) of patients operated by PHILOS shows varuscollapse. At 6 month follow up 14 had excellent, 27 had good results and 15 had fair and 3 poor results. 92.86% of patients had same occupation as before injury. Only 4.76% of patients had changed occupation after treatment. Only one patient (2.38%) had retired from duty but was due to other associated injuries.

Only three patients had implant impingement which was removed at 8 month when fracture had united.

No patient developed nonunion, implant failure, avascular necrosis or reflex sympathetic dystrophy like complication.

| HEAD SHAFT ANGLE ON F UP  | TOTAL  |            |
|---|--------|------------|
|   | NUMBER | PERCENTAGE |
| GOOD 130 <sup>0</sup> -150 <sup>0</sup>                                       | 26     | 61.90%     |
| FAIR 115 <sup>0</sup> -130 <sup>0</sup><br>150 <sup>0</sup> -175 <sup>0</sup> | 14     | 33.33%     |
| POOR <115 <sup>0</sup> >175 <sup>0</sup>                                      | 2      | 4.76%      |
| <b>Total</b>  | 42     | 100%       |

### IV. Conclusion

Locking plate achieves favorable biological fixation for proximal humerus fractures with few complication.. Principle of fixation is reconstruction of the articular surface, including the restoration of the anatomy, stable fixation, with minimal injury to the soft tissues preserving the vascular supply, should be applied. An adequate surgical technique will minimize complications and an aggressive rehabilitation regime will ensure the best possible result.

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