



## Evaluation of study of Fracture of Proximal Humerus treated by Operative vs Conservative Methods.

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### ABSTRACT

**Background:** Clinical study of 30 cases on proximal humerus fractures treated by both surgically and conservatively.  
**METHODOLOGY:**

#### Criteria for the study:

1. All closed proximal humerus fractures
2. Young adults age group above 20
3. All genders

#### Conditions which are not taken into the study:

1. Compound fractures
2. Pathological fractures
3. Adults of age group less than 20.

**KEYWORDS :** PROXIMAL HUMERUS FRACTURE, PROXIMAL HUMERUS LOCKING COMPRESSION PLATE, PERCUTANEOUS PINNING.

#### Introduction:

Humerus is the largest and longest bone of the upper limb. The proximal humerus is uniquely adapted to allow for the large range of motion of the shoulder which is ball and socket type of joint. Proximal humerus is divided into the following parts: 1) head, 2) anatomical neck, 3) greater tuberosity, 4) lesser tuberosity, 5) surgical neck, 6) intertubercular sulcus.

The major arterial supply of proximal humerus is from axillary artery and its lateral branches: the anterior and posterior humeral circumflex artery.

The orientation of rotator cuff attachment to the humerus is important to understand the displacement of tuberosities in proximal humerus fractures. The other two important muscles which must be considered in relation to proximal humerus are deltoid and pectoralis major muscle.

Proximal humerus fractures occur most commonly following a fall on an outstretched hand and road traffic accidents. Most common in old age due to osteoporosis. The incidence is about 5-6% of all fractures and 35-40% of all humerus fractures. 70-80% of proximal humerus fractures occur most commonly in patients of age group above 60 years.

Fractures in younger age groups (adolescents) are most commonly following direct trauma to the shoulder in road traffic accidents, sports injuries, and falls from height.

The quality of bone stock determines the fracture configuration and fracture displacement.

Treatment of proximal humerus fractures was first described by Hippocrates, who proposed a method of weight traction to aid fracture reduction and bone healing. Management of this fracture has been a controversy since many years. For undisplaced and minimal displaced fractures of proximal humerus are treated conservatively, because fracture occurs in the metaphyseal bone region and the healing time is very less.

Displaced fractures and in osteoporosis, techniques of internal fixation with less disruptive soft tissue dissection, and minimal fixation with wire and non-absorbable sutures have been successful. With a low complication rate, AO type locking plates are also being

used, but they require more muscle stripping and may lead to infection. However, some cases are prone for malunion, a vascular necrosis of the humeral head, nonunion, axillary nerve injury, and marked stiffness of the shoulder have been noted, producing significant disability for the individual.

Hence, treatment of proximal humerus fractures demands a knowledge of anatomy, surgical indication, appropriate techniques and implants available. The results of both methods of treatment differ with selection of the patient and treatment procedure.

#### MATERIALS AND METHODS:

Patients attending to hospital between June 2015 and May 2017, proximal humerus fracture 30 patients were selected for study, after excluding the patients who came under exclusion criteria, among 30 patients, 20 were male patients, 10 were female patients. Most common age group was 40-60, the usual mechanism of injury was road traffic accident.

All patients on admission were clinically assessed and stabilized hemodynamically. Radio graphs were taken in two planes: anteriorly and laterally. A plaster slab was applied to the fracture limb and immobilized to relieve pain and discomfort. Depending upon the patient's general condition, age, and profession, it was decided whether to treat conservatively or surgically.

In patients with fragments displaced >1 cm or angulated >45 degrees, good bone quality and with no comorbid conditions, surgical fixation was done. Goal of internal fixation was stable reduction and allowing early motion.

Clinical and radiological union was evaluated by Neers scoring system every 6 months and then 1 year after surgery. Routine laboratory investigations were done for all patients undergoing surgery. After obtaining fitness for anesthesia and surgery, routine antibiotic and anti-inflammatory drugs were given after surgery.

Check x-rays were taken on 2 post-operative days and discharged following suture removal after 10 days. Patients were advised to follow up every 6 weeks for the first 6 months and then 1 year after surgery. Shoulder range of motion exercises were taught during every visit.

**OPERATIVE PROCEDURES:** In all the operative cases, brachial

plexus block was given and patient in supine position on fracture table.

### 1. Percutaneous pinning:

Fixing of reduced fracture fragments by percutaneous pinning using K Wires. After reduction of fracture, arm is held in adduction and internal rotation and if fracture reduction is stable. Two pins are passed directing proximally above the deltoid insertion through the shaft and in to head and tuberosity, with both the pins in perpendicular planes. Third pin applied proximally from above into greater tuberosity, in to distal fragment.

. Percutaneously fix the reduced fracture fragment using 2mm k wires with arm in adduction and internal rotation. The reduced fracture fragments are then internally fixed with 2.7mm or 4mm cannulated screws. Pins are removed after radiographic evidence of fracture stability which is seen after 4-6 weeks.



**Fracture of Right Proximal : Fracture Stabilized with k Wires Humerus**

2. Open reduction and internal fixation with plating:

The unstable two part and three part fractures require stable reduction and internal fixation. Ideally greater tuberosity is approached through lateral incision and surgical neck by deltopectoral incision.

On exposure of fracture site the biceps tendon acts as a guide interval between two tuberosities and the rotator interval between the anterior part of supra spinatus and superior edge of sub scapularis.

In greater tuberosity fractures the head is internally rotated by pull of subscapularis muscle and tuberosity is displaced proximally and posteriorly.

This is reduced with bone holding forceps and fixed to humerus with no.20 stain less steel wire, non-absorbable sutures, tension band wiring or screws.

In two part or three part fractures extension of delto pectoral approach may be required. In case of good bone quality this can be fixed with an AO T-plate on lateral aspect of humerus or a blade plate in osteoporotic bones.

**PROXIMAL HUMERUS LOCKING COMPRESSION PLATE;** proximal humerus locking plate is anatomical and shaped to accommodate the junction of the humeral head and the shaft. In the area of the humeral head the plate has in addition to the holes for the locking head screws, small holes in order to fix the rotator cuff with sutures or circlage wires.

The screw holes of the plates in the area of the humeral head have been designed exclusively for the insertion of locking head screws for safe fragment fixation. The plate seats very firmly in the bone due to the screw orientation and the locked screw anchorage.

**FIXATION PRINCIPLES;** locked plating using locking screws. Screws lock to the plate, forming a fixed angle construct. Bone healing is achieved indirectly by callus formation when using locking screws exclusively.

Once the locking screws engage the plate no further tightening is possible. Therefore the implant locks the bone segments in their relative positions regardless of degree of reduction. stability under

load by locking the screws to the plate, the axial force is transmitted over the length of the plate. The risk of a secondary loss of the intra operative reduction is reduced.



**Fracture of Left Proximal Humerus : Fracture Stabilized with Plating**

### DISCUSSION:

Fractures of proximal humerus are one of the most common injuries encountered by orthopaedic surgeon. Incidence also has increased in the last few years due to change in life style and increase in road traffic accidents.

Anatomical reduction and good rehabilitation is a strong predictor for good functional outcome. Earlier these fractures were considered simple and were managed by plaster cast techniques, slings, and slab etc. proximal humerus have gained more importance because of its complexity and complications. Anatomical reduction and rehabilitation is most important part of fracture management

Most of the proximal humerus fractures are non-displaced and stable; these are treated non-operatively successfully with early rehabilitation. But severely displaced and comminuted fractures need surgical management for best shoulder function.

The incidence of proximal humerus fractures is 1-3% of all fractures in this institution. During the period between June 2015 to April 2017. Where 30 patients of proximal humerus fractures have been treated with either conservatively or surgically and assessed the outcome using Neers shoulder scoring system. Out of 30 patients 15 were treated conservatively with a slab and 15 patients treated surgically, where 4 were treated with percutaneous K-wires, 3 were treated with cancellous screws and 8 with plating.

Most common age group of patients in this study was 40-60 years with average age being 50 years compared to 45 years in GERBER, C et al study and 58 years in SAMEER AGARWAL et al study. In this study there is significant male dominance with ratio of 1.7:1. SAMEER AGARWAL et al. Most common mode of injury in this study was RTA (66%).

In this study right side involvement is more 9 (20 out of 30). GERBER C et al also reported right side predominance (18 out of 34). 30% out of 30 patients in this study had evidence of osteoporosis. MA FAZAL et al also reported osteoporosis was one of the common cause for increasing incidence of proximal humerus fractures.

Most common fracture in this study was 2 part fracture (17 out of 30), followed by un-displaced fractures (8 out of 30) patients. MA FAZAL et al study 13 out of 27 patients. Where as in FRANCESCO Muncibietal study most common type was 3 part fractures (31 out of 41) followed by 2 part fractures. MA Fazaletal and Francesco muncibietal studies have treated all patients by phlo locking plate and percutaneous k wires respectively.

Most common complication encountered in this study with conservative management was stiffness of shoulder which was present in 06 out of 15 patients. And malunion in 4 cases and delayed union in 2 cases.

Complications encountered with management of fractures surgically, was stiffness in 2 patients' malunion in 1 case and delayed union in 1 case.

In Ramchander siwach study there was nocase of shoulder stiffness and most common complication in their study was malunion,8 out of 25 patients.

Final outcome in this study was excellent in 14 out of 30cases (46.66%) satisfactory in 13 out of 30 cases (43.33%) and poor in 3 out of 30 cases (10%),where as in Richard j Hawkins study final outcome was excellent in 8 out of 15 cases.(53.3%).

#### **SUMMARY AND CONCLUSION:**

There are several methods available for the management of proximal humerusfractures. Our choice of treatment was based on patient age, general condition, co morbid conditions, bone quality, degree of displacement of fracture and neers classification.

In our study 30 cases of proximal humerus fractures were treated. 15 cases were treated conservatively in which 6 had stiffness of shoulder, 4 had malunoin 2 had delayed union.

15 cases were treated surgically in which 3 patients had stiffness of shoulder. I had malunoin 1 had delayed union.

Therefore more complication was seen with conservative management, when compared to surgical management.

From this sample study we conclude that operative procedures remains better option for fracture proximal humerus when compared to conservative management. Because of less complication and early mobilization.

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