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To evaluate functional outcome of proximal humerus interlocking osteosynthesis (PHILOS) plating by constant & murley scoring system for treatment of displaced proximal humerus fractures

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Abstract

Background: This is a Prospective study carried out at Department of Orthopaedics & traumatology, Index Medical College Hospital & Research Centre, Indore for One Year. 30 patients of proximal humerus fracture were attended in casualty and OPD and were admitted.

Result: Age variation in series was from 18 to 70 years. Proximal Humerus Fracture was found to have high incidence in 51 to 70 years age group.

In our series of 30 patients, treated by PHILOS plating most common complication was varus malunion and least common complication was implant failure.

Conclusion: Fractures of the upper end of humerus account for 4-5% of all fractures. They occur more frequently in older patients after the cancellous bone has become weakened by senility and osteoporosis. In older patients even less severe trauma (fall) can produce significant injury which is the most common cause. In our study 53% belongs to 51 to 70 years age group.

PHILOS plates are pre-shaped & pre-contoured plates to match proximal humeral anatomy with multiple proximal locking screw placement options has made fixation of complex fractures easy. It provides rigid fixation, enhanced axial & angular stability & allows early mobilization of the shoulder without compromising fracture union.

Keywords: Proximal humerus, osteosynthesis, fractures

Introduction

Fractures occurring at or proximal to surgical neck of humerus are described as proximal humerus fractures. These fractures account for almost 7% of all fractures and make up 80% of all humerus fractures. In patients above the age of 65 years proximal humeral fractures are the second most frequent upper extremity fracture, and next to proximal femur and distal end radius fractures^[1].

Various modalities of management for proximal humeral fractures which includes conservative and operative. Depending on displacement and angulation of fracture fragments management is planned. In this study Neer's proximal humerus fracture classification was followed^[2].

Proximal humerus fractures are the result of an indirect force such as a fall onto the outstretched arm rather than a direct blow to the shoulder. The origin of a proximal humerus fracture is due to a combination of factors, which include relatively osteoporotic bone (in the elderly), direct contact against the adjacent acromion and glenoid rim, and forceful pull of the rotator cuff muscles and extrinsic muscles such as the pectoralis major^[3].

They occur most commonly in the elderly. In younger patients, high-energy trauma is the cause and displacement is often more severe. PHILOS plate provides rigid fixation, more angular stability and early mobilisation.

Material & Method

This is a Prospective study carried out at Department of Orthopaedics & traumatology, Index Medical College Hospital & Research Centre, Indore for One Year. 30 patients of proximal humerus fracture were attended in casualty and OPD and were admitted.

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After the patient with proximal humerus was admitted to the hospital, all history and clinical details were recorded in history sheet according to planned proforma. Radiographic evaluation was done and fractures were classified according to Neer's classification.

Patients were shifted to the ward after initial temporary immobilization with universal shoulder immobilizer or POP U slab. All routine investigations were done with complete medical and anaesthetic fitness for surgery. All patients were treated by open reduction and internal fixation by PHILOS plating.

The Inclusion criteria of the study

1. Patients presenting with displaced proximal humerus fractures two, three and four part according to Neer's classification.
2. All skeletally matured patients aged 18 years and above.
3. Compound fractures of proximal humerus grade I, II according to Gustilo-Anderson grading.
4. Patients presenting with displaced proximal humerus fractures with dislocation of shoulder joint.

The Exclusion criteria of the study

1. One part fracture according to Neer's classification.
2. Fractures in pediatric age group.
3. Pathological fractures.
4. Polytrauma patients with expected delay in primary and immediate fixation.
5. Compound fractures of humerus with Grade III according to Gustilo-Anderson grading.
6. Old, un-united fractures of humerus.
7. Patients with uncontrolled diabetes, patients on chronic steroid therapy and Immuno-compromised patients.



Fig 1: Deltopectoral approach

Results

Age variation in series was from 18 to 70 years. Proximal Humerus Fracture was found to have high incidence in 51 to 70 years age group.

Table 1: Age distribution Age incidence

Age group (years)	Number of patients	Percentage
18-30	04	13%
31-40	05	17%
41-50	05	17%
51-60	10	33%
61-70	06	20%

In our series of 30 patients, treated by PHILOS plating most common complication was varus malunion and least common complication was implant failure.

Table 2: Complication

Complications	No. of Patients	Percentage
Joint stiffness	02	6.7
Implant failure(Pull out of screws, implant breakage)	Nil	Nil
Primary and secondary screw perforations	03	10%
Sub acromial impingement	01	3.3%
Avascular necrosis of humeral head	02	6.7%
Infection	01	3.3%
varus Malunion	04	13.3%
Non-union	Nil	Nil

Discussion

Comminuted fractures of the proximal humerus are at risk of fracture displacement, screw loosening, and fixation failure. Open reduction and internal fixation with commonly used AO T-plate and other plate and screws has been associated with a high rate of complications, such as subacromial impingement, screw loosening in osteoporotic bone or avascular necrosis.^[4] The surgical technique requires extensive soft tissue stripping, compromising the vascular supply to the humeral head. Minimally invasive methods of plate osteosynthesis may increase the risk of neurovascular damage^[5]. Percutaneous pinning requires advanced skills, good bone quality, minimal fracture comminution, and a cooperative patient during rehabilitation.

Every fourth patient fixed with a blade plate is at risk of blade perforation into the glenohumeral joint. In an in vitro model of a reconstructed 3-part proximal humeral fracture, the locking plate provided better torsional fatigue resistance and stiffness than did the blade plate. The bulky PlantTan plate requires wide surgical exposure and has high rates of infection and fixation failure in patients with osteoporosis^[6,7].

Conclusion

Fractures of the upper end of humerus account for 4-5% of all fractures. They occur more frequently in older patients after the cancellous bone has become weakened by senility and osteoporosis. In older patients even less severe trauma (fall) can produce significant injury which is the most common cause. In our study 53% belongs to 51 to 70 years age group.

PHILOS plates are pre-shaped & pre-contoured plates to match proximal humeral anatomy with multiple proximal locking screw placement options has made fixation of complex fractures easy. It provides rigid fixation, enhanced axial & angular stability & allows early mobilization of the shoulder without compromising fracture union.

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