

Epidemiological study of fracture of proximal humerus in adult at tertiary care centre

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Abstract

Background: Proximal humerus fracture (PHF) is the second most common fracture of upper extremity. For better clinical management and to reduce comorbidities and mortality, it is essential to survey and map the characteristics of individuals who have suffered proximal humerus fractures. **Aim:** To define the epidemiology of population presenting with a proximal humerus fracture. **Material and Methods:** A total of 30 patients with proximal humerus fracture treated with proximal humeral locking plates were studied for epidemiological characteristics. **Results:** The age of patients ranged from 20-80 years with mean age of 44.5 years. Majority were males. Eleven (36.7%) patients were injured due to fall on outstretched hand, 16(53.4%) were injured in road traffic accidents. 21(70%) were less than 60 years. Of these 21(70%) patients, 15 (50%) had sustained proximal humerus fractures in road traffic accident. **Conclusion:** It is suggested that preventive measures require more government involvement regarding control measures and traffic education to reduce the accident rate.

Key Word: proximal humerus fracture, males, road traffic accidents, epidemiology

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INTRODUCTION

Proximal humerus fracture (PHF) is the second most common fracture of upper extremity following distal forearm fracture. Proximal humeral fractures are the third most frequent fracture in elderly patients after hip fracture and Colles' fracture.¹ More than 70% of patients with a proximal humeral fracture are over 60 years and 3/4 are women. PHFs account for approximately 4% to 5% of all fractures^{1,2} and their incidence is increasing, especially in the elderly.¹⁻³ As the life expectancy is increasing, incidence of these fractures is on rise as a consequence of osteoporosis. Almost 80% of the proximal humerus

fractures in patients 18 years and older are a result of simple fall.⁴ In elderly patients with poor bone stock. These fractures usually result from low velocity indirect trauma while as in younger age group the mechanism is that of high velocity trauma like road traffic accidents.⁵ Conservative treatment, consisting of immobilization with simple sling is indicated by up to 85% of cases resulting from low-energy trauma, since they have little deviation between the fragments.^{6,7} Surgical treatment is indicated for unstable fractures with rotational deformity that are difficult to reduce and maintain. Among the most common procedures, fixation with plates and screws, percutaneous fixation with wires, external fixation, fixed-angle plates, blocked plates and arthroplasty stand out. For better clinical management and to reduce comorbidities and mortality, it is essential to survey and map the characteristics of individuals who have suffered proximal humerus fractures. Therefore, the present study was conducted to define the epidemiology of population presenting with a PHF

MATERIAL AND METHODS

The present study included 30 cases of proximal humerus fractures treated with proximal humeral locking plates

(PHLP and PHILOS) at our Tertiary Care Centre. Walk-in patients seen in out-patient and Emergency Department of our hospital, who have been diagnosed of displaced fracture proximal humerus were included in the study.

Inclusion criteria

- Patients with Simple closed fractures of proximal humerus - two, three and four parts.
- Fracture with dislocation.
- Medically fit for surgery
- Mono-trauma / poly-trauma patients.
- Adult patients age more than 18 years.

Exclusion criteria

- Fracture due to malignancy
- Compound injuries
- Medical contraindications to surgery
- Distal neurovascular deficit
- Patients less than 18 years old
- Patients with signs of infection
- Patients not willing for surgery
- Severely osteoporotic patients.

The patients were assessed on the basis of their history of mechanism, the mode of injury, clinical signs and symptoms. All patients were thoroughly examined. All patients presented with involved shoulder and elbow flexed and supported by other hand. Careful inspection of the deformity, swelling and ecchymosis were done. Clinically tenderness, bony irregularity, crepitus and neurovascular status was assessed. Relevant clinical findings, open injuries, other skeletal injuries were duly recorded in the patient proforma. The shoulder trauma series radiographs including True antero-posterior view of shoulder joint and / or Axillary view of scapula were taken carefully by positioning of patient. All radiographs were evaluated to assess the fracture configuration and the extent of comminution. After initial work up, patients were posted for surgery after medical fitness till then immobilized in a pouch arm sling. All patients were operated within average period of 5 days (2 days-18 days) of injury depending upon admission to hospital and medical fitness.

RESULTS

The present study consists of 30 cases of proximal humerus fractures treated with proximal humeral locking plates (PHLP and PHILOS). The age of patients ranged from 20-80 years with mean age of 44.5 years. The number of patients between 15-30 years constituted maximum (33.4%) in this study. Among the 30 patients included, 20 were male and 10 were female patients. This suggests higher affection in male population. Left side was involved in 56.6% of patients and right in 43.3% of

patients. Non dominant side was involved in 56.6% of patients Table 1.

Table 1: Demographic profile of the study population

Demographic data	No. of patients	Percentage
Age groups (years)		
15-30	10	33.4%
31-45	05	20%
46-60	06	20%
61-80	09	30%
Sex		
Male	20	66.6%
Female	10	33.3%
Side involved		
Right	13	43.3%
Left	17	56.6%

Table 2 shows distribution of age and mechanism of injury. Eleven (36.7%) patients were injured due to fall on outstretched hand, 16(53.4%) were injured in road traffic accidents, 1 patient (3.4%) had fall from height and 2 (6.7%) patients were injured during seizures. Out of the 30 patients in our study, 21(70%) were less than 60 years and 9(30%) were ≥ 60 years of age. Of the 21(70%) patients younger than 60 years, 15 (50%) had sustained proximal humerus fractures in road traffic accident. Of the 9(30%) patients ≥60 years, 8 (26.7%) patients had sustained this fracture due to fall on outstretched hand. Our study thus shows that proximal humerus fractures are now increasingly seen in younger population with good bone stock following high energy trauma and in elderly it is essentially a low energy trauma.

Table 2: Distribution of age and mechanism of injury

Mechanism of injury	Age <60 years	Age ≥60 years	Total
Fall on outstretched hand	3 (10%)	8 (26.7%)	11(36.7%)
Road traffic accident	15 (50%)	1	16(53.4%)
Seizures	2(6.7%)	0	2(6.7%)
Fall from height	1(3.4%)	0	1(3.4%)
Total	21(70%)	9(30%)	30 (100%)

Of the 30 cases, there were 15(50%) cases of two part fractures, 9(30%) with three part and 6 (20%) with four part fractures. The mean duration of stay in hospital was 10 days (7-23 days).

Table 3: Duration of stay in hospital

Duration of stay (Days)	No. of cases	Percentage
6-10	23	76.6%
11-15	4	13.33%
16-20	1	3.33%
21-25	2	6.7%
Total	30	100%

DISCUSSION

The present study was conducted to measure the socio-economic impact involved in the genesis of proximal humerus fractures caused by domestic accidents (in the elderly) and traffic accidents involving motorcycles (in young adults), since the morbidity associated with this type of injury is significant. The mean age in our study is 43.86 years. Many previous studies from western countries had mean age ranged from 56 to 70 years.^{6,8,9} This may be due to road traffic accidents as the most common mechanism of injury in our study. Many of the old aged patients present late to the hospitals and amongst them many of them choose conservative mode of management. In the present study, the ratio between male to female ratio was 2:1. The dominance of males may be because, in India, males are more involved than females in outdoor activities hence more vulnerable to vehicular accidents. Due to social customs certain tasks involves more risks are done by males like working at heights, driving, labor work and travelling. In comparison to other studies from western countries,^{8,10} we have male predominance probably due to above mentioned reasons. However, study by Kumar GN reported male predominance (68.6%).¹¹ In our study high kinetic energy trauma (road traffic accidents and fall from height) in men are 65% and simple fall constitutes around 16.6% only. In females 70% is due to simple fall and 30% due to high kinetic energy trauma. In study by Roux *Aet al* in men, 55% of the fractures were due to a simple fall and 45% to high energy kinetic trauma. In women, the cause was a simple fall in 82% of the cases.⁹ The high incidence of fractures among men arising from this type of accident draws attention to the need for prevention policies and traffic education. It was observed in the population studied that most patients suffering proximal humerus fracture are predominantly male active victims who had road traffic accidents. The surgery performed in all the patients was placement of locked plate; patients remained in hospital on average for 10 days. It is suggested that preventive measures require more government investment

regarding control measures and traffic education to reduce the accident rate.

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