



ISSN (P): 2521-3466
ISSN (E): 2521-3474
© Clinical Orthopaedics
www.orthoresearchjournal.com
2019; 3(1): 85-87
Received: 04-02-2019
Accepted: 06-03-2019

Dr. Vaibhav Bhadbhade
Assistant Professor, Department
of Orthopedics, Srinivas
Institute of Medical sciences and
Research Centre, Mangalore,
Karnataka, India

Dr. Channabasava
Assistant Professor, Department
of Orthopedics, Srinivas
Institute of Medical sciences and
Research Centre, Mangalore,
Karnataka, India

Clinical profile of proximal humeral fractures

Dr. Vaibhav Bhadbhade and Dr. Channabasava

DOI: <https://doi.org/10.33545/orthor.2019.v3.i2b.12>

Abstract

In younger patients, proximal humerus fractures are usually caused by high-energy trauma, such as traffic accidents or sporting accidents. In older patients, the most common cause is a fall on the outstretched arm from a standing position, which is a type of low-energy trauma. The study design was two year prospective study. Patients sustained with proximal humerus fractures presenting at Department of Orthopedics, were included in the study. In this study, 56% of the patients presented with 2-part fracture, 37% with 3-part fracture and 7% with 4-part fracture of the proximal humerus according to Neer's classification.

Keywords: Neer's classification, younger patients, proximal humerus fractures

Introduction

The humerus bone is the largest and most proximal long bone of the upper extremity [17]. The proximal humerus has head of humerus, the greater tuberosity, the lesser tuberosity, the bicipital groove, and proximal shaft. It also has two necks and it is important to differentiate between the anatomical neck which is at the junction of the head of humerus and the tuberosities and surgical neck which is at the area below the greater and lesser tuberosities. The boundaries of the surgical neck are variable without a distinct line [1].

The Greater tuberosity - lies posterior and superior to humeral shaft and provides attachment for the supraspinatus, infraspinatus and teres minor muscles. An analysis of the Finnish trauma registry revealed that the incidence of proximal humerus fracture rose from 32 to 105 per 1,00,000 persons per year between 1970 and 2002, along with a rise in the average age of affected women, from 73 to 78 [2].

In Hungary, health insurance data from 1999-2003 reveal an incidence of 342 per 100 000 persons per year; in emergency rooms in the USA, there were 61 consultations for proximal humerus fracture per 1,00,000 persons in the year 2008 [3].

Fractures of proximal humerus comprise approximately 4 to 5% of adult fractures, of which 20% fracture are displaced requiring surgery. In Neer's original series of 300 fractures the average age of the patients was 55.6 years. Lind found that three fourth of his patients with proximal humerus fractures were over 60 years.

Mayo clinic identified a predominance of proximal humerus fracture in women at ratio of 1.5:1 and Lind noted female to male ratio 3:14

In younger patients, proximal humerus fractures are usually caused by high-energy trauma, such as traffic accidents or sporting accidents. In older patients, the most common cause is a fall on the outstretched arm from a standing position, which is a type of low-energy trauma [4].

Proximal humerus fractures occur as a result of fall from height usually in elderly due to osteoporotic bones, and from high energy trauma in young patients. When on examination there may be visible swelling and extensive ecchymosis but lacerations and open fractures are rare. In cases of anterior dislocation there may be anterior bulge below the coracoid and in case of posterior dislocation there may be seen posterior bulge and anterior sulcus. On palpation tenderness around the shoulder will be present and movements may be associated with crepitus. Integrity of axillary nerve can be assessed by testing sensation at the lateral aspect of shoulder [5].

Typically, the patient holds the injured arm in a protective posture close to the chest. Pain, swelling, tenderness and hematoma of the proximal portion of the humerus may indicate the

Correspondence

Dr. Channabasava
Assistant Professor, Department
of Orthopedics, Srinivas
Institute of Medical sciences and
Research Centre, Mangalore,
Karnataka, India

presence of a fracture. The perfusion and sensorimotor function of the limb should be tested in the periphery. The axillary nerve functioning should be tested as well.

X-ray assessment includes a trauma series with a true anteroposterior view, an axial view, and a scapular Y view. In the acute condition, because of pain, the axial view is often unobtainable. Computed tomography (CT) may yield important additional information particularly for complex fracture types, about the size and position of the individual fragments and about potentially accompanying bony injuries, e.g., of the coracoid process or glenoid [6].

A careful history is an important component of the assessment, to establish the mechanism of injury and to define the "personality" of the fracture. Further, it is imperative that concomitant injuries, such as head injuries, are identified and treated. Information about the patient's pre-trauma shoulder function and other co-morbidities are important considerations in the fracture management [5].

Physical examination is used to identify damage to skin or neurovascular bundle. Open fractures of the proximal humerus are rare although, fractures that displaced may cause swelling, extensive ecchymosis, skin tenting, or pressure necrosis. Neurologic or vascular injuries are most common in cases of fracture-dislocations. They must be identified expeditiously, documented, and appropriately treated, often in conjunction with other specialists such as vascular surgeons and/or interventional radiologists [6].

Standard radiographs of the shoulder, including an anterior-posterior view, an axillary view, and a trans-scapular view, should be obtained on all patients with a suspected shoulder fracture. In the majority of cases, these plain radiographs are sufficient to define the fracture pattern. Computed tomography (CT) can be used to evaluate for a head-splitting component, better define the bone quality or the degree of comminution, and to further delineate configuration of the fracture. Full-length views of the affected and contralateral humerus may be useful for templating if arthroplasty is being considered [7, 8].

Methodology

Study design

The study design was two year prospective study.

Source of Data

Patients sustained with proximal humerus fractures presenting at Department of Orthopedics, were included in the study.

Sample Size

A total of 30 cases were enrolled in the study.

Inclusion

- Patients with 2-, 3- or 4-part proximal humeral fracture
- Patients aged greater than 18 years. Women of reproductive age group will be included only if they have no plan of pregnancy during the study duration.
- Patients willing to undergo surgery for treatment of proximal humeral fractures

Exclusion

- Type III-C compound fractures
- Patients not fit for surgery due to any pre-existing morbidity

Results

Table 1: Sex distribution

Sex	Number	Percentage
Female	14	46.7
Male	16	53.3
Total	30	100

In the present study 47% of the patients were females and 53% were males. The male to female ratio was 1.12 : 1

Table 2: Age distribution

Age	Number	Percentage
21-30yrs	7	23.33
31-40yrs	2	6.67
41-50yrs	4	13.33
51-60yrs	7	23.33
>60yrs	10	33.33
Total	30	100

In this study most of the patients presented with age beyond 60 years.

Table 3: Nature of trauma

Nature of trauma	Number	Percentage
RTA	21	70
Fall	9	30
Total	30	100

In the present study 70% of the patients presented with road traffic accident and 30% with history of fall as nature of trauma.

Table 4: Side involved

Side	Number	Percentage
Right	17	56.7
Left	13	43.3
Total	30	100

In this present study 57% of the patients presented with right sided proximal humerus fracture

Table 5: Duration of injury

Duration	Number	Percentage
1	21	70
2	6	20
3	3	10
Total	30	100

In the present study, most of the patients (70%) presented with duration of one day following injury

Table 6: Fracture classification

Neer classification	Number	Percentage
2 part	17	56.7
3 part	11	36.7
4 part	2	6.7
Total	30	100

In this study, 56% of the patients presented with 2-part fracture, 37% with 3-part fracture and 7% with 4-part fracture of the proximal humerus according to Neer's classification.

Discussion

Proximal humerus fractures may present with many different configurations in patients with varying comorbidities and

expectations. As a result, the treating physician must understand the fracture pattern, the quality of the bone, other patient-related factors, and the expanding range of reconstructive options to achieve the best functional outcome and to minimize complications.

Current treatment options range from non-operative treatment with physical therapy to fracture fixation using percutaneous or open techniques to arthroplasty reconstructions. However, the best management in these injuries is still uncertain. Most of the proximal humerus fractures which are un-displaced can be treated conservatively. Even if the injury is thoroughly analysed and the literature is understood, treatment of displaced fracture or fracture dislocation is difficult. Many studies have shown that the displaced fracture of the proximal humerus have a poor functional prognosis when left untreated because of severe displacement of fragments^[9].

Open reduction and internal fixation (ORIF) provides the features of anatomical fracture reduction, rigid fixation, and the possibility of bone grafting. With the aim of getting anatomically accurate reductions, rapid healing and early restoration of function, open reduction and internal fixation, is the preferred modality of treatment.

In proximal humerus fractures, PHILOS plate offers good functional outcome with context to the early joint mobilisation and rigid fixation of the fracture. The present study was undertaken to assess the efficacy and the functional outcome following internal fixation with PHILOS (proximal humeral internal locking system) plate for displaced proximal humerus fractures.

The incidence of proximal humerus fractures is high in women. Women are affected two to three times as often as men^[4]. In the present study majority that is 53% of the patients were males with male to female ratio of 1.12:1 suggesting male preponderance. However, Agarwal S, *et al.*^[10] and Gerber C, *et al.* reported male preponderance with male to female ratio of 1.7:1 and 1.35:1 respectively. The higher male to female ratio can be explained by the involvement of day to day activities compared to females.

Proximal humerus fractures are common, particularly in the elderly^[4]. In this study beyond 60 years was the commonest age group comprised of 33% of the patients. The youngest patient was aged 24 years and the eldest was aged 80 years. These findings were consistent with a study by Gerber C, *et al.*^[11] who reported mean age of 44.9 years.

In the present study 70% of patients presented with road traffic accident and 30% history of fall as mode of injury. These findings were near consistent with a study done by Aggarwal S, *et al.*^[12] who reported fall in 65% of the patients and road traffic accident in 35%. In this present study most of the patients presented with left fracture (57%). Similar fracture pattern was reported in a study by Gerber C, *et al.*^[11]

In this study, patients with only 2-part, 3-part & 4-part fracture of proximal humerus were included based on Neer's classification. Accordingly, the 2-part fractures were noted in most of the cases (57%) followed by 3-part (38%) and 4-part (7%).

It is evident that, majority of proximal humerus fractures are treated conservatively. There are different surgical options for the fixation of proximal humerus fractures, e.g., interfragmentary fixation with sutures, percutaneous pinning, intramedullary fixation and hemiarthroplasties. The recent trend is to use less invasive procedures for reduction and fixation of the fracture. The lesser invasive the procedure the more are the operative prerequisites, viz., 1) good bone stock, 2) minimal

comminution of the tuberosity, 3) patient willing to participate in postoperative physiotherapy regimes and 4) advanced operative skills.

Fixation of proximal humerus fractures with plates and screws has been associated with complications such as pullout of screws in osteoporotic bone, subacromial impingement and avascular necrosis of the humeral head due to excessive periosteal stripping.

Conclusion

Proximal humerus fractures occur as a result of fall from height usually in elderly due to osteoporotic bones, and from high energy trauma in young patients. When on examination there may be visible swelling and extensive ecchymosis but lacerations and open fractures are rare.

References

1. Gerald R, Williams, Kirk L, Wong. Two-part and three part fractures Management of proximal and distal humerus fracture. *Orthop Clin North Am.* 2000; 1:1-21.
2. Grönhagen C, Abbaszadegan H, Révay S, Adolphson P. Medium-term results after primary hemiarthroplasty for comminute proximal humerus fractures: A study of 46 patients followed up for an average of 4.4 years. *J Shoulder Elbow Surg.* 2007; 16(6):766-73.
3. Handoll H, Gibson J, Madhok R. Interventions for treating proximal humeral fractures in adults. *Cochrane Database Syst Rev* 2003; (4):CD000434.
4. Court-Brown C, Caesar B. Epidemiology of adult fractures: A review. *Injury* 2006; 37(8):691-7.
5. Lous U, Bigliani. Chapter 9 The shoulder, ed. Charles Rockwood, Frederick A. Fractures of proximal humerus. In Rockwood CA, Matsen. Philadelphia: W.B. Saunders, 1990; 1:278-334.
6. Court-Brown C, Garg A, McQueen M. The epidemiology of proximal humeral fractures. *Acta Orthop Scand.* 2001; 72(4):365-71.
7. Lanting B, Mac Dermid J, Drosdowech D, Faber K. Proximal humeral fractures: a systematic review of treatment modalities. *J Shoulder Elbow Surg.* 2008; 17(1):42-54.
8. Neer CS. Displaced proximal humeral fractures. I: classification and evaluation. *J Bone Joint Surg [Am]* 1970; 52-A:1077-89.
9. Esser RD. Treatment of three and four part fractures of the proximal humerus with a modified cloverleaf plate. *J Orthop Trauma,* 1994, 788-91.
10. Fazal MA, Haddad FS. PHILOS plate fixation for displaced proximal humeral fractures. *J Orth Surg.* 2009; 17(1):15-8.
11. Gerber C, Schneeberger AG, Vinh TS. The arterial vascularization of the humeral head. *J Bone Joint Surg* 1990; 72A:1486-93.
12. Aggarwal S, Bali K, Dhillon MS, Kumar V, Mootha AK. Displaced proximal humeral fractures: an Indian experience with locking plate. *J Orthop Surg Res.* 2010; 5:60.