



Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/11471

DOI URL: <http://dx.doi.org/10.21474/IJAR01/11471>



RESEARCH ARTICLE

CASE REPORT OF RIGHT PROXIMAL HUMERUS FRACTURE COMBINED WITH IPSILATERAL HUMERUS SHAFT FRACTURE WITHOUT SHOULDER DISLOCATION OR NEUROLOGICAL DEFICIT

Rana A. Althukair, Abdullah S. Alrowithi and Sama A. Halawi

MBBS, Surgical Resident at Saudi Board of Orthopedic, Orthopedic Department King Faisal Specialist Hospital, Jeddah, Saudi Arabia.

Manuscript Info

Manuscript History

Received: 05 June 2020

Final Accepted: 10 July 2020

Published: August 2020

Abstract

Multiple fractures of the humerus are uncommon injuries and usually associated with high-energy trauma. This article reviews detailed history, examination and investigations of 40 years-old male patient with ipsilateral co-existing fractures of the proximal humerus and humeral shaft without shoulder dislocation. The present report showed the successfully management with open reduction and internal fixation of the fractures. At the 6 months follow-up, the patient improved, with full range movement.

Copy Right, IJAR, 2020,. All rights reserved.

Introduction:-

The humerus is the largest bone in the upper extremity. ⁽¹⁾ The proximal humerus articulates with the glenoid of the scapula to form the glenohumeral (shoulder) joint. ⁽²⁾ Fractures of the humerus are considered the third most common fracture in elderly patients after those of the hip and distal radius. ⁽³⁾ Fracture in humerus bone can occur proximally, in the shaft (diaphysis), or distally. Proximal humerus fractures account for four to five percent of all humerus fractures ⁽⁴⁾ whilst the mid-shaft humeral fractures are almost two percent. ⁽³⁾

The incidence of proximal humerus fractures increases with age and linked to gender factor with 1:4 male to female ratio. ^(5,6) The major risk factors are frequent falls and low bone density. ⁽⁶⁾ Anterior or posterior dislocations of the humeral head can occur in association with proximal humeral fractures. ⁽⁷⁾ On other hand, mid-shaft humeral fractures occur in all age groups, but show a bimodal distribution. ⁽⁸⁾ The first peak is seen in the third decade in males and is often associated with high velocity trauma; the second peak is noted in females in the seventh decade and is associated with low velocity falls. ⁽⁹⁾ Trauma, increasing age, and osteoporosis are known risk factors. ^(8,9)

Injury-related bone fractures have been linked with morbidity, disability and death. World Health Organization (WHO) stated that the road traffic accidents (RTAs) are the first leading cause of death among adult population. ⁽¹⁰⁾ In Saudi Arabia, concerning the statistics published by the Ministry of Interior-General Directorate of Traffic, 518,785 accidents occurred in 2015, an average of 1421 a day and 59 an hour. The most commonly fractured bone was the femur (25.9%), followed by the humerus (21.6%) and spine (17.6%), while the least common was the scapula (1%). ⁽¹¹⁾

Multiple fractures of the humerus are a rare injury and usually associated with high-energy trauma. Moreover, in all instances, the proximal humerus fracture is associated with a shoulder dislocation. ^(12,13) This is the case report with detailed history, examination of 40 years-old male patient with ipsilateral co-existing fractures of the proximal humerus and humeral shaft without shoulder dislocation.

Corresponding Author:- Rana A Althukair

Address:- MBBS, Surgical Resident at Saudi Board of Orthopedic, Orthopedic Department King Faisal Specialist Hospital, Jeddah, Saudi Arabia.

Report of the case:**Clinical presentation and history:**

A 40 year-old male was sent to our emergency room after hitting by a car on his right side. The patient complained about pain in the right arm and right leg and was unable to perform movements. He is not on medications, no surgical history and no history of medical conditions.

Examination:

Patient was vitally stable and conscious. Physical examination revealed a swollen and tenderness over the right arm and right leg associated with some bruising and there was no open wounds. Both neurological and vascular examinations were normal.

Investigations and Procedure:

Initial X ray radiographs (**Figure 1**) showed closed comminuted fracture in right proximal humerus that was extending to the mid shaft. There was no evidence of glenohumeral dislocation. Moreover, the X ray showed closed right mid shaft fibula fracture.

He underwent a surgical treatment of open reduction and internal fixation of his humerus fracture by using plate and screw to stabilize the humeral shaft fracture.

Postoperative Management and Follow-up:

Following the surgery, there were no immediate complications and he had discharged home after 3 days of his surgery in a stable condition. He got follow up visits in the outpatient clinic at regular intervals. His surgical wound was clean and dry. Follow up x ray (**Figure 2**) showed acceptable alignment of his right humerus with positive signs of radiological union in his right fibula.



Figure 1:-X-ray radiograph of Right shoulder showing fracture in Humerus bone.

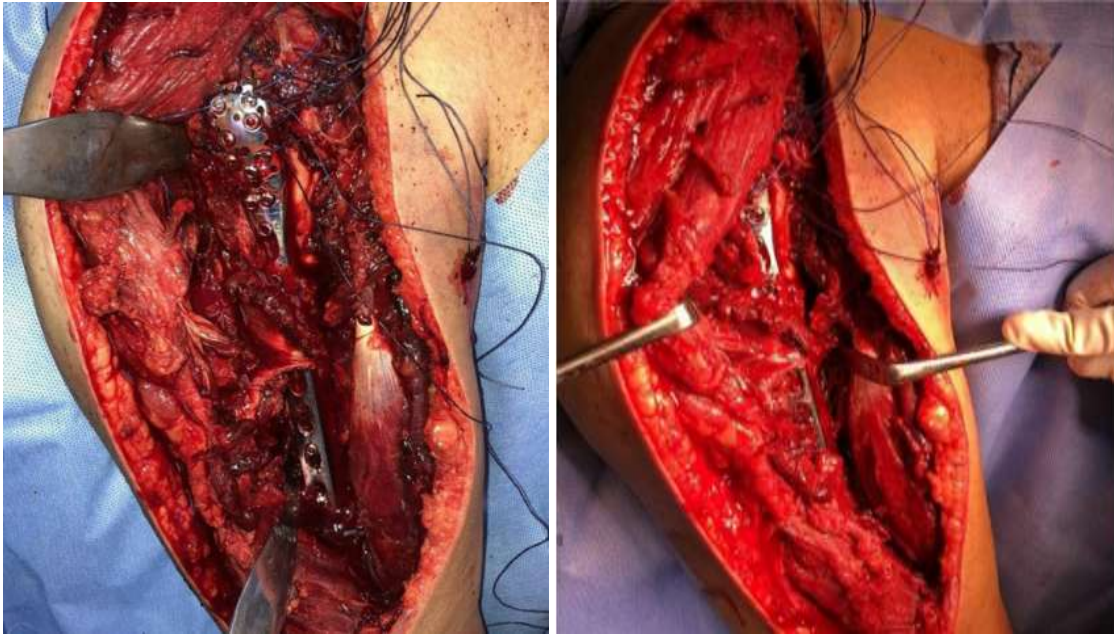


Figure 2:-Intraoperative photos of the open reduction and internal fixation of right humerus fracture by using plate and screw.



Figure 3:-Postoperative plain radiographs of open reduction and internal fixation of right humerus fracture by using plate and screw.

Discussion:-

The incidence of humeral fractures associated with severe trauma was relatively higher among children and young adults.⁽⁸⁾ Among the elderly, however, proximal humeral fractures associated with moderate trauma.⁽⁶⁾ This case report describes a rare combination of proximal and mid-shaft humerus fracture without shoulder dislocation in 40 years old male.

Neer classification schemes are used to describe proximal humerus fractures based on the biomechanical forces involved and the resulting displacement patterns.⁽¹⁴⁾ Researchers indicated that 80% of the proximal humeral fractures were classified as Neer's type I fractures (ie, one-part), representing minimally displaced fractures

regardless of the number of fragments.^(14,15) This is what happened in the present patient who was classified as having partthree fracture.

Concerning the association between the dislocation and fracture, there are previous authors who have justified various mechanisms of injury and the timing of the dislocation or the fracture in the same injury. Frequently the indirect force leading to the dislocation and direct force leads to the fracture.⁽¹⁶⁾ The common injury forces that result in shoulder fractures include tension, axial compression, torsion, bending or axial compression with bending.⁽¹³⁾ The present case had ipsilateral co-existing fractures of the proximal humerus and humeral shaft without shoulder dislocation that could be explained by the mechanism of injury.

The proximal and shaft of humerus bone receive its blood supply from branches of the axillary artery and brachial artery.^(1,2) However, the neurovascular supply of humerus bone can be disrupted by fracture in anatomic neck or shaft if there is considerable displacement of fragments.⁽³⁾ Therefore, humerus fractures need a detailed neurovascular exam of the affected arm, including careful assessment of the function of the axillary, suprascapular, radial, median, and ulnar nerves. Incidence of neurovascular injuries among the fractures of the humerus reach up to 34% and this percentage may increase if there is significantly displaced or a concomitant humeral dislocation.^(3,4) Fortunately, the present case had intact neurovascular supply and this match with absence of dislocation.

In context of treatment, although the surgical intervention is generally needed for significantly displaced or multiple fractures⁽¹⁷⁾ but the conservative or non-operative with closed reduction in U shaped slab treatment had promising advantages in minimizing the risk of infection and other operative complications.⁽¹⁸⁾ One systematic review suggests that patients with displaced fractures treated conservatively experience more pain and greater loss of motion.⁽¹⁹⁾ However, operative options include minimally invasive osteosynthesis, intramedullary nail with cerclage of the greater tuberosity, percutaneous pinning and finally the open reduction and internal fixation. Open reduction and internal fixation (ORIF) provides the features of anatomical fracture reduction, rigid fixation, and the possibility of bone grafting.⁽²⁰⁾ The present case had an unstable fracture pattern and indicated for open reduction and internal fixation of humerus fracture by using plate and screw to stabilize the humeral shaft fracture.

Conclusion:-

Shoulder dislocation combined with proximal humerus fracture in children is rare. Recognition of this type of injury is important. In addition to palpation and anteroposterior and lateral humeral x-ray, we suggest adding bilateral anteroposterior shoulders x-ray routinely to confirm the shoulder location. Open reduction is needed for irreducible dislocation in some severely displaced fractures. Judging from the results of our case, we recommend open reduction with ESIN fixation for the irreducible displaced proximal humeral metaphyseal fractures with shoulder dislocation in children.

Ethical consideration:

Patient was informed that data from the case would be submitted for publication, and she gave her consent.

Conflicts of interest:

None.

References:-

1. Forro SD, Lowe JB. Anatomy, shoulder and upper limb, arm structure and function.
2. McCausland C, Sawyer E, Eovaldi BJ, Varacallo M. Anatomy, Shoulder and Upper Limb, Shoulder Muscles.
3. Court-Brown CM, Caesar B. Epidemiology of adult fractures: a review. *Injury*. 2006 Aug 1;37(8):691-7.
4. Court-Brown CM, Garg A, McQueen MM. The epidemiology of proximal humeral fractures. *Acta orthopaedica Scandinavica*. 2001 Jan 1;72(4):365-71.
5. Palvanen M, Kannus P, Niemi S, Parkkari J. Update in the epidemiology of proximal humeral fractures. *Clinical Orthopaedics and Related Research* (1976-2007). 2006 Jan 1;442:87-92.
6. Chu SP, Kelsey JL, Keegan TH, Sternfeld B, Prill M, Quesenberry CP, Sidney S. Risk factors for proximal humerus fracture. *American journal of epidemiology*. 2004 Aug 15;160(4):360-7.
7. Clement ND, Duckworth AD, McQueen MM, Court-Brown CM. The outcome of proximal humeral fractures in the elderly: predictors of mortality and function. *The bone & joint journal*. 2014 Jul;96(7):970-7.

8. Ekholm R, Adami J, Tidermark J, Hansson K, Törnkvist H, Ponzer S. Humeral shaft fractures. An epidemiological study on 401 fractures. In *Orthopaedic Proceedings* 2009 Mar (Vol. 91, No. SUPP_I, pp. 180-180). The British Editorial Society of Bone & Joint Surgery.
9. Updegrave GF, Mourad W, Abboud JA. Humeral shaft fractures. *Journal of shoulder and elbow surgery*. 2018 Apr 1;27(4):e87-97.
10. Global status report on road safety 2018. WHO. https://www.who.int/violence_injury_prevention/road_safety_status/2018/en/ Accessed 10/7/2019.
11. Alraddadi AS, Al Muklass AM, Alhammad S, Alasmari A, Alhejji K, Alghathber N. Fractures caused by car accidents admitted to a tertiary care hospital: A cross-sectional study. *Journal of Musculoskeletal Surgery and Research*. 2020 Jan 1;4(1):36.
12. Kontakis GM, Galanakis IA, Steriopoulos KA. Dislocation of the shoulder and ipsilateral fracture of the humeral shaft: case reports and literature review. *Journal of Trauma and Acute Care Surgery*. 1995 Nov 1;39(5):990-2.
13. Srinivas S, Kasis A. Co-existing fractures of the proximal humerus and humeral shaft without shoulder dislocation—a rare injury. *The Annals of The Royal College of Surgeons of England*. 2010 Mar;92(2):e25-8.
14. Kristiansen B, Andersen UL, Olsen CA, Varmarken JE. The Neer classification of fractures of the proximal humerus. *Skeletal radiology*. 1988 Sep 1;17(6):420-2.
15. Carofino BC, Leopold SS. Classifications in brief: the Neer classification for proximal humerus fractures.
16. Farooque K, Khatri K, Dev C, Sharma V, Gupta B. Mechanism of injury and management in traumatic anterior shoulder dislocation with concomitant humeral shaft and ipsilateral scapula fracture: a case report and review of the literature. *Journal of medical case reports*. 2014 Dec 1;8(1):431.
17. Eifff MP, Hatch RL. *Fracture Management for Primary Care E-Book*. Elsevier Health Sciences; 2011 Jul 6.
18. Koval KJ, Gallagher MA, Marsicano JG, Cuomo F, McShinawy A, Zuckerman JD. Functional outcome after minimally displaced fractures of the proximal part of the humerus. *JBJS*. 1997 Feb 1;79(2):203-7.
19. Misra A, Kapur R, Maffulli N. Complex proximal humeral fractures in adults—a systematic review of management. *Injury*. 2001 Jun 1;32(5):363-72.
20. Nho SJ, Brophy RH, Barker JU, Cornell CN, MacGillivray JD. Management of proximal humeral fractures based on current literature. *JBJS*. 2007 Oct 1;89(suppl_3):44-58.