

# Results Of Surgical Treatment With Proximal Locking Plate In Fractures Of The Upper Extremity Of The Humerus

B. EBYELMEALY, ATBATOU, J. RADJ, K. LAHRACH, A. MARZOUKI, F. BOUTAYEB

Department of Traumatology-Orthopedics A, CHU HASSAN II Fès, Morocco

**Abstract:** *Fractures of the upper extremity of the humerus are subject to different therapeutic modalities. To determine the epidemiological aspect of fractures of the upper end of the humerus in adults, and to assess. To assess the functional and radiological results of patients in our series treated with proximal plate. Plate. This is a series of 12 cases from the Traumatology and Orthopedics Department A of the CHU HASSAN II University Hospital, Fez. We recorded the epidemiological data of the patients and the circumstances of the trauma. Reduction was assessed on postoperative radiographs. In hindsight, functional results were assessed using the Constant score. Our series included 5 men and 7 women. The average age of our patients was 41 years. Domestic accidents by falls were noted in 75%, 2-fragment fractures were found in 83.33% of cases. Cases. Fractures without callus were consolidated in 16.66% of cases. In fractures of the Fractures of the upper end of the humerus, an appropriate osteosynthesis, depending on the patient and the fracture, and early postoperative rehabilitation early post-operative rehabilitation.*

**Keywords:** surgical treatment with proximal locked plate

## **INTRODUCTION :**

Fractures of the upper end of the humerus are common, accounting for around 5% of all fractures,

And their frequency rises to over 10% over the age of 65, when they become the third most common cause of osteoporotic osteoporotic fractures of the limbs, after fractures of the upper extremity of the femur and the wrist [1].

By definition, these fractures occur above the lower edge of the insertion tendon of the pectoralis major muscle. Numerous

Many classifications have been proposed, depending on the location of the fracture lines in relation to the articular surface and tuberosity,

The number of fragments, displacement, and whether or not they are associated with glenohumeral dislocation [2]. To date, there is no consensus

algorithm for the therapeutic management of these fractures [3], which range from simple immobilization to

from simple immobilization to humeral arthroplasty, via numerous osteosynthesis techniques. This treatment

Must respond to two main imperatives: to ensure proper healing and early mobility of the shoulder

mobility, shoulder stiffness being the main therapeutic complication. The aim of this study is to evaluate the

results of locked proximal plate osteosynthesis in surgical neck fractures of the humerus in our patients.

Patients in our series.

## **MATERIALS AND METHODS :**

This is a retrospective study conducted in the orthopedic trauma department A of the CHU HASSAN II of Fez,

involving 12 cases of fractures of the upper end of the humerus, over a 2-year period between January 2020 and

January 2022. We recorded the patients' clinical data, i.e. sex, age at the time of the trauma, medical and surgical

laterality, side affected, occupation, circumstances of injury, mechanism of injury and associated

mechanism of injury and lesions associated with FESH. The radiological work-up included 2 orthogonal incidences : one frontal

And an axillary profile. A CT scan of the shoulder was requested whenever the standard work-up was deemed insufficient.

whenever the standard work-up was deemed insufficient. The types of fracture were classified according to the number of fragments

NEER classification (figure 1).

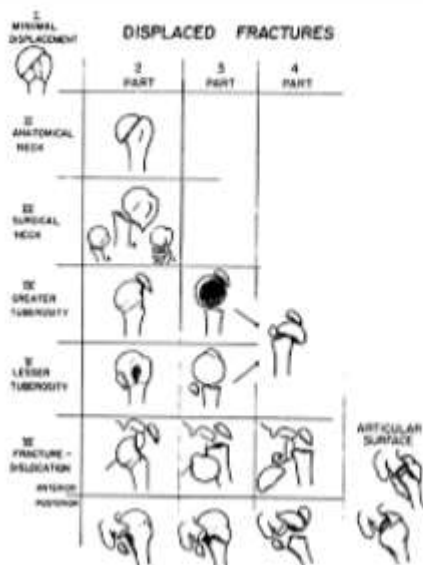


Figure 1 : NEER classification of fractures of the upper end of the humerus

We studied the time taken to treat the fractures, the different approaches and the methods used to place the proximal plate Of the locked upper end of the humerus. At follow-up, functional outcome was assessed using the Constant score, radiological evaluation was studied on each incidence, looking for consolidation in good position Or pseudarthrosis or callus, based on assessment of head tilt by measuring the alpha angle, formed by the intersection of a line parallel to the axis of the humeral shaft and a line passing through the anatomical neck of the humeral head.

Of the humeral head When angle  $\alpha$  is between  $30^\circ$  and  $60^\circ$  ( $45^\circ \pm 15^\circ$ ), the head is considered not tilted from

tilted. Above  $60^\circ$ , the displacement is valgus, and below  $30^\circ$ , varus. Necrosis of the humeral head or arthrosis was also sought.

### RESULTS :

Our series includes 7 women and 5 men, the average age of our patients was 41 years with extremes ranging from 19 years to 63 years, the etiologies of fractures were either domestic accidents by falls in 75% and public

The non-dominant side was found in 4 cases. Lesions associated with FESH

involved the lower limb in 2 cases: 1 tibial pilon fracture and 1 trochanteric fracture. The

2-fragment fractures were found in 7 cases, and 3 to 4-fragment fractures in 5 patients.

patients, i.e. in 41.66% of cases. The average time to surgery was 02 days.

deltopectoral (anterior) approach was used in 8 patients, i.e. 66.66% of cases, the superolateral (lateral) approach

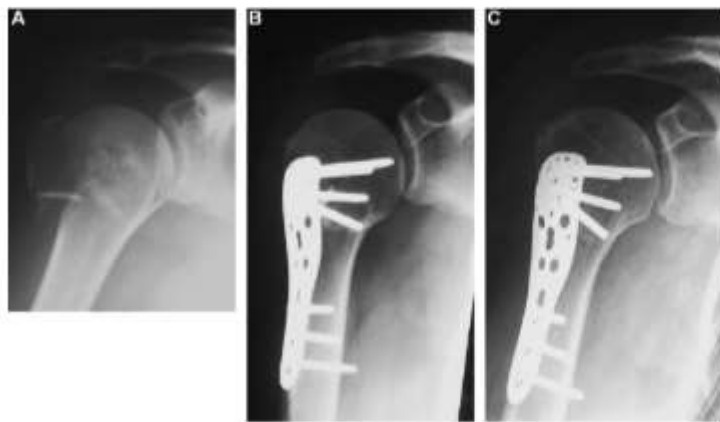
(lateral) approach was used in 4 patients, or 33.33% of cases. Osteosynthesis using a proximal locked plate was

used in all patients in our series. Analysis of postoperative radiographs showed satisfactory

reduction in 83.33% of cases, i.e. in 10 patients. We noted 1 case of varus head tilt and 1 case of valgus head tilt.

valgus. No cases of infection or sepsis of the osteosynthesis material were recorded.

between J14 and J45 post-op. The mean constant score was 68.3, with extremes ranging from 36 to 89.



**Figure 2 : Upper humeral fracture treated with proximal locking plate**

#### DISCUSSION :

In our study, FESH occurred at an average age of 41 years. They remain lower than those reported in European and American series [4-5-6], where the average age is between 60 and 72.

Age-related increase in bone fragility is one of the risk factors predisposing to this type of fracture

Fracture [7, 8]. In the literature, female predominance has been noted in some series [9, 10], which is consistent with our results.

Concordant with our results. The mean constant score following treatment with a locked plate was

68.3 in our series. This score is comparable to those reported in the literature, as illustrated in

Table 1 [6, 18-21]. In our series, we noted 02 cases of malunion.

In varus and valgus or in translation. We agree with Südkamp [19] that vicious callus is secondary

vicious callus is secondary to imperfect postoperative reduction.

<i>Auteurs</i>	<i>Score de Constant</i>
Königshausen <i>et al</i> [6] 2012	66
Südkamp <i>et al</i> [7] 2009	70,6
Schliemann <i>et al</i> [8] 2015	71,3
Brunner <i>et al</i> [9] 2009	72
Solberg <i>et al</i> [10]2009	68.6
Notre série	68,3

**Table 1: Constant score comparison between different studies**

### **CONCLUSIONS :**

Locked proximal plate osteosynthesis for fractures of the upper end of the humerus is a reliable means of

Stable fixation of reducible fractures, as well as good functional results thanks to the possibility of early mobilization of the shoulder and avoidance of the onset of fractures.

early mobilization of the shoulder, avoiding stiffness and retractile capsulitis, and resumption of autonomy and daily activity.  
autonomy and daily activity.

### **BIBLIOGRAPHY :**

- 1. Vandebussche E.,Nich C.Fractures de l'extremite superieure de l'humerus.EMC (Elsevier Masson SAS,Paris),Radiologie et imagerie medicale-musculosquelettique – neurologique-maxillofaciale,31-016-B-10,2010**
- 2. Vandebussche E et Hutten D.Fractures de l'extrémité superieure de l'humerus.EMC(Editions scientifiques et medicales Elsevier SAS, Paris, tous droits réservés),Appareil locomoteur,14-038-A-10,2000,20p.**
- 3. Favard L.,Berhouet J.,Bacle G.Traitement chirurgical des fractures de l'extremite superieure de l'humerus de l'adulte.EMC(Elsevier masson SAS,Paris),techniques chirurgicales-Orthopedie-Traumatologie,44-290,2010**
- 4. McLean AS, Price N, Graves S, Hatton A, Taylor FJ. Nationwide trends in management of proximal humeral fractures: an analysis of 77 cases from 2008 to 2017. J Shoulder Elbow Surg. Nov 2019;28(11):2072-8.**
- 5. Court-Brown CM, Garg A, MM. The epidemiology of proximal humeral fractures. Acta Orthop Scand. Janv 2001;72(4):365-71.**
- 6. Königshausen M, Kübler L, Godry H, Citak M, Schildh,Seybold D. Clinical outcome and complications using a polyaxial locking plate in the treatment of displaced proximal humerus fractures. A reliable system- Injury. Févr 2012;43(2):223-31**
- 7. Südkamp N, Bayer J, Hepp P, Voigt C, Oestern H, Kääh M et al. Open reduction and internal fixation of proximal humeral fractures with use of the locking proximal humerus plate. Results of a prospective, multicenter, observational study. J Bone Joint Surg Am. Juin 2009;91(6):1320-8.**

**8. Schliemann B, Hartensuer R, Koch T, Theisen C, Raschke MJ, Kösters C et al. Treatment of proximal humerus fractures with a CFR-PEEK plate: 2-year results of a prospective study and comparison to fixation with a conventional locking plate. J Shoulder Elbow Surg. Août 2015;24(8):1282-8**

**9. Brunner F, Sommer C, Bahrs C, Heuwinkel R, Hafner C, Rillmann P et al. Open reduction and internal fixation of proximal humerus fractures using a proximal humeral locked plate: a prospective multicenter analysis. J Orthop Trauma. Mars 2009;23(3):163-72**

**10. Solberg BD, Moon CN, Franco DP, Paiement GD. Surgical Treatment of Three and Four-Part Proximal Humeral Fractures. J Bone Jt Surg-Am. Juill 2009;91(7):1689-97**