

# The Results of Surgical Treatment of Fractures of The Proximal End of The Humerus

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**Abstract :** *Objective : fractures of the proximal end of the humerus are traumatic lesions frequent ,their treatment is controversial.The objective of this study is to evaluate the functional and radiological results of the upper end of the humerus treated surgically with osteosynthesis . Patients and methods : we conducted a retrospective study of 71 cases collected in the department orthopaedics surgery A from the CHU HASSAN II DE Fez between January 2016 and June 2020. A Treatment was surgical in principle by osteosynthesis. We excluded fractures fromThe proximal humerus treated orthopaedically or by shoulder prosthesis. Results : The overall average age was 46.8 years, the sex ratio (M/F) was 1.36. The analysis statistics of functional and radiological results did not show the superiority of aTechnical in relation to the other, The average absolute Constant score was 85 For patients locked and unlocked plate-treated, 87 for Kapandii type plugging and 91 for Hackethal type plugging. Advanced age and 4-fragment fractures represent a Pejorative factor, Constant's average score is 77.9 for the age group over 60 And 53.9 for 4-fragment fractures. The overall mean cephalodiaphyseal angle was 48°. Conclusion : The quality of functional results, depends in addition to the technique or equipment used, several factors such as age, the type of fracture the study did not show any superiority of one surgical technique over the other.*

**Keywords :** Fracture, the proximal end of the humerus, osteosynthesis

## INTRODUCTION :

Proximal humerus fractures are limited to fractures that occur above the insertion of the upper border of the pectoralis major. They represent 4% to 10% of all fractures (1). They occur either in young patients during high-energy trauma or in elderly patients with poor bone quality. They are the third most common osteoporotic limb fracture after 65 years of age, after fractures of the upper end of the femur and the wrist (2).

Numerous classifications have been proposed according to the location of the features in relation to the articular surface and the tuberosities, the number of fragments, the displacement, and whether or not they are associated with glenohumeral dislocation (3). To date, there is no consensus on a decision algorithm for the therapeutic management of these fractures, which range from simple immobilization to humeral arthroplasty, via numerous osteosynthesis techniques. The aim of this retrospective study is to evaluate the functional and radiological results of fractures of the upper end of the humerus treated surgically with osteosynthesis.

## PATIENTS AND METHODS

We conducted a retrospective study in the department of osteoarticular surgery A of the CHU HASSAN II of Fez, over a period from January 2016 to June 2020, we collected 71 cases of fracture of the proximal end of the humerus treated by osteosynthesis with an average delay of 10 months.

All proximal humerus fractures treated by osteosynthesis were included in our study, regardless of the anatomopathological type of the fracture. We excluded proximal humerus fractures treated orthopedically or by shoulder prosthesis.

Data were collected using a data sheet containing age, sex, side affected, mechanism of injury, radiological stage of fracture, surgical technique, time to consolidation, functional assessment, anatomical reduction and postoperative complications. The radiological evaluation was based on standard front and side views of the shoulder. These same films were used to evaluate the time to consolidation and the quality of reduction based on the cephalodiaphyseal angle measurement [3], the radiological stage was evaluated according to the Neer classification [4] and the functional evaluation was done according to the average absolute Constant and Murley score [5] which could be calculated for each patient.

## RESULTS

The average age of our patients was 46.80 with a sex ratio M/F 1.36. The etiology of the injury mechanism was a fall from height in 40.8% followed by road accidents in 39.5%.

All our patients presented pain with functional impotence. The left side was affected in 43 patients (61%) while the right side was affected in 28 patients (39%). More than half of the patients treated (67.20%) had a 2 fragment fracture; 30% had a 3 fragment fracture; 2.8% had a 4 fragment fracture.

The intervention time was less than 48 hours in 80% of patients.

In our study, the most common surgical technique used was the locked plate in 25 patients (35%), followed by the screw plate and Kapandji type pinning in 21 patients (29.7%), and the face and hackethal type pinning in 2 patients (2.8%) each. The reduction was judged to be anatomical in 58 cases (82%), and non-anatomical in 13 cases (18%). There were three cases of superficial wound infection, which were rapidly resolved by local care and antibiotic therapy, and three cases of secondary displacement.

The mean time to consolidation was 56 days with extremes between 44 days and 63 days.

The mean constant score was 86.46 with extremes of 50 and 97. For cases treated with locked and non-locked plates, it was 85; 87 for Kapandji type pinning and 91 for Hackethal type pinning. The overall mean cephalodiaphyseal angle was 48°.

Regarding late complications, we noted 3 cases of malunion; 3 cases of shoulder stiffness; 2 cases of subacromial impingement and 1 case of pseudarthrosis.

## **DISCUSSION**

In our study, FESH occurred at a mean age of 46.8 years. They remain lower than those reported in European and American series [4-6] in which the average age is between 60 and 72 years. The age-related increase in bone fragility is one of the risk factors predisposing to this type of fracture [7, 8]. Fractures treated by prosthesis of the upper end of the humerus are excluded, which explains our lower average age compared with the literature.

In the literature, female predominance has been noted in some series [9, 10]. In our study, however, there was a predominance of males with a rate of 58%, and a sex ratio of 1.36H/1F.

The patients treated in our study had a mean Constant score of 86, 47. These results are comparable to those reported in the literature [11, 12]. Analysis of the results according to age found that the mean Constant score was 92 between 17 and 39 years of age, a score of 86.5 for the age group between 40-60 years and a score of 77.9 for the age group over 60 years.

The mean Constant score was 89.63; 83.26; and 53.9 for 2-fragment, 3-fragment, and 4 fragment, respectively. We have thus detected, like the majority of authors, that advanced age and 4 fragment fractures represent a pejorative factor [13, 14, 15].

The mean constant score following treatment with a locked plate was 85 in our series, 87 for osteosynthesis by Kapandji pinning and 91 for Hackethal pinning. This score is comparable to the scores cited in the literature [16, 17, 18, 19]. Like most authors, we note that there was no statistically significant difference between the different surgical techniques.

In our series, we noted 03 cases of malunion; these were extra-articular malunion with a low degree of varus, valgus or translation. We agree with Südkamp [20] that malunion is secondary to imperfect postoperative reduction. Pseudoarthrosis was noted in 1.4% of cases, while Doursounian [21] and Hessmann [22] found 13% and 21%, respectively, of cases of pseudoarthrosis, especially at the level of the tubercles.

## **CONCLUSION**

The quality of functional results depends not only on the technique or material used, but also on several factors such as age, type of fracture, anatomical result after treatment, and also on the quality of postoperative rehabilitation. These results, like those in the literature, do not favor one technique over the other.

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