

Fracture of the Humeral Palette in Adult Patient: Therapeutic and Evolutive Aspect at Gabriel Touré Hospital: About 35 Cases

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Abstract

Introduction: Fractures of the humeral pallet occur between the distal insertion of the anterior brachial muscle and the joint space of the elbow. It represents 2% of all elbow fractures. These lower humeral fractures present a therapeutic challenge to trauma. These fractures are in the majority of joint cases and can be accompanied by loss of substance, which makes their functional prognosis random despite the application of the main therapeutic principles: exact reduction with possible bone graft; stable osteosynthesis, usually allowing early rehabilitation. This work focused on identifying therapeutic aspects and assessing treatment outcomes. **Material and Methods:** This was a descriptive cross-sectional study of patients with a fracture of the humeral palette from January 2015 to December 2019 at the Orthopaedic Trauma Department CHU Gabriel Touré Bamako. **Results:** We collected 35 cases of fractures of the humeral palette. The average age was 39.25 years with extremes of 22 and 74 years. The male gender predominated (71.4%) with a sex ratio of 2.5. Etiologies were dominated by falls with 19 cases (54.3%) and stroke with 13 cases (37.1%). The standard X-ray of the face and profile of the elbow was performed in all our patients. The most frequent types of anatomoradiology were supra condylar fractures type A in 16 cases (45.7%), supra and inter condylar fractures type C in 15 cases (42.9%); 4 cases of uni condylar fractures type B (11.4%). Associated lesions were observed in 42.85%. Surgical treatment was performed in 80% of cases. Complications were dominated by elbow stiffness in 18 cases (51.42%), secondary displacement in 5 cases (14.28%), ossifications in 4 cases (11.42%). At an average decrease of 3.2 years our results were considered good in 45.7%. **Conclusion:** Fractures of the humeral palette are relatively common with associated lesions. The com-

plexity of the fracture with associated lesions makes treatment difficult with unpredictable evolution.

Keywords

Fracture, Humeral Palette, Anatomopathology, Treatment, Evolution
Bamako, Mali

1. Introduction

Fractures of the humeral pallet occur between the distal insertion of the anterior brachial muscle and the joint space of the elbow [1]. It represents 2% of all elbow fractures [1] [2]. The incidence of this fracture increases with the severity of the trauma especially in the male age group of 10 to 30 years [2].

These lower humeral fractures present a therapeutic challenge to trauma [1] [2]. These fractures are in the majority of joint cases and can be accompanied by loss of substance, which makes their functional prognosis random despite the application of the main therapeutic principles: exact reduction with possible bone graft; stable osteosynthesis, usually allowing early rehabilitation [2]. This work focused on identifying therapeutic aspects and assessing treatment outcomes.

2. Material and Methods

It was a descriptive cross-sectional study concerning patients with a fracture of the humeral palette from January 2015 to December 2019 at the Orthopaedic-Traumatology Department CHU Gabriel Touré Bamako.

We included all patients with a fracture of the humeral palette whose treatment and follow-up were performed in the department.

Clinical, para-clinical and developmental information was collected from patient records and follow-up in consultation. For each patient the following data were noted: age, gender, etiology of the trauma, mechanism, standard X-rays of the elbow face and profile for diagnosis and specify the pathological type according to the AO classification, associated lesions, skin lesions according to Gustilo and Anderson, admission time, time between trauma and osteosynthesis, type of treatment, physiotherapy protocol, and functional outcome according to the Mayo-clinic (**Table 1**).

We did not include patients under the age of 16, recoil under the age of 18 months, and lost-sight patients.

Data management and analysis was done according to SPSS 20.0, Word and Excel 2010.

The confidentiality of the data was respected with the approval of the ethics committee of the Faculty of Medicine and Dentistry of the University of Sciences, Techniques and Technologies of Bamako.

Table 1. Mayo-clinic performance score.

Type of fracture	Excellent	Right	Medium	Wrong
A	1	5	2	1
B	2	10	3	1
C	3	11	3	3
Total	6	26	8	5

3. Results

We have collected 35 cases. The socio-demographic features of patients are summarized in **Table 2**.

The causes were falls with 19 cases (54.3%), road accidents in 13 cases (37.1%), 1 sports accident (2.8%) and 1 work accident case.

The lesion was located on the left in 24 cases (68.6%) and on the right in 11 cases (31.4%). Pathological types were type A (45.7%) (**Figure 1**), type B in 11.4%, and type C in 42.9% (**Figure 2**). We observed 15 cases of associated lesions (42.85%). There were 5 other segment fractures (14.28%), 3 open fracture cases (8.57%) of which Gustilo and Anderson type 1 (2 cases) and type 2 (1 case), 4 elbow dislocation cases (11.42%) and 3 polytrauma cases (8.57%). We performed surgical treatment in 80% and orthopedic treatment (brachio-anti-brachiopalmar and posterior splint) in 20%. General anesthesia was performed in 26 patients with 92.85% and axillary block surgery in 2 patients (7.14%).

All our patients benefited from ceftriaxone-based antibiotic prophylaxis 2 g induction before inflating the pneumatic tourniquet. We performed osteosynthesis by screw plate in 14 cases (40%) (**Figure 3**), screwing in 8 cases (23%), screwing in 3 cases (8%) and external fixing in 3 cases (8%).

We recorded 18 cases of stiffness of the elbow (51.42%), 5 cases of secondary displacement (14.3%) linked to osteosynthesis deficiency, extra articular vicious cal in 4 cases (11.42%) related to insufficient reduction of orthopedic treatment, 4 cases of ossification of the elbow (11.42%) due to the deperiorisation (**Figure 4**), 3 cases of sepsis (8.6%), pseudosteoarthritis septic in 1 case. According to the functional score of the Mayo-clinic, we obtained an average decrease of 3.2 years, 47.5% good results.

4. Comments and Discussion

The limitations of this study are: sample size, failure to perform a CT scan for full injury equilibrium, and insufficient recoil for functional assessment.

In our series, the average age of patients was 39.25 years. This is consistent with the literature [3] [4] [5] [6]. The left side was the most reached with a frequency of 68.6%, according to the literature [7], There is no predominance of side over other. Falls made up 54.3% of the etiologies in our study. Their main etiology followed by stroke [8]. In the literature bone lesions represent in the fractured poly 9% of cases for LECESTRE [9] and 38.5% for SARAGAGLIA [10]. We report a rate of 23%.

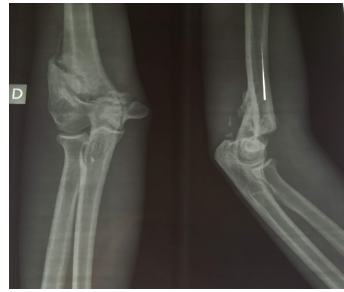


Figure 1. X-ray of the right elbow face and profile: Type A being consolidated.



Figure 2. X-ray of the right elbow face and profile: fracture type C.

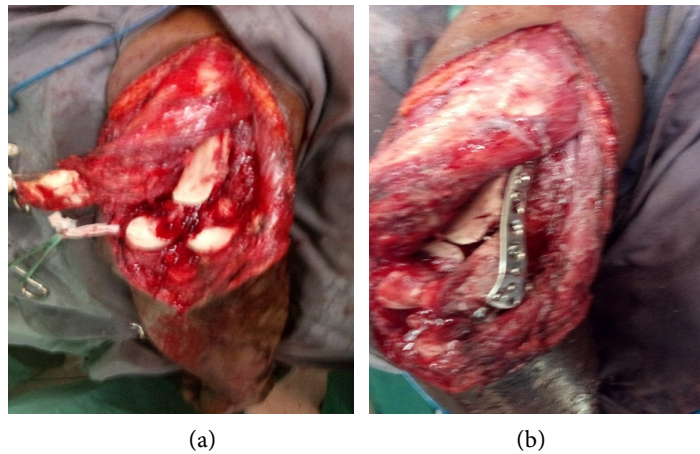


Figure 3. (a): Trans-tricipital surgical view with ulnar nerve neurolysis, (b): Anatomical screwed plate placement.



Figure 4. Type C distal end left humerus fracture consolidated with ossification and removal of anatomically screwed plate.

Table 2. The socio-demographic features of patients.

Age (years)	Gender		Total
	M	F	
20 - 40	16	6	22
41 - 50	5	2	7
+51	4	2	6
Total	25	10	35

In our series the supracondylar fractures represented 45.7%. But the joint fractures combined are the most represented (54.3%). Our results are higher than those of Mauriceau *et al.* [11] and Bilsel *et al.* [12] which find 20% and 27.7% respectively. This could be explained by the fragility of the epiphyseal zone and the mechanism of trauma with the energy that accompanies it.

In our series the surgical treatment was performed in 80% of cases. This surgical treatment recommended by many authors [8] [9] [10] [12] should meet the principles of the treatment of joint fractures: stability, mobility and indolence enabling early rehabilitation. The complex joint lesions explain this high frequency of surgical treatment and the improvement of the technical platform.

Joint stiffness was the most common complication (51.42%). Our results are higher than those of Chantelot *et al.* [4] and Ouzaa M R and *et al.* [13] which report elbow stiffness in 21% and 10% respectively. This high rate is explained on the one hand by the frequency of complex lesions, orthopedic treatment as well as open fractures whose treatment requires additional immobilization and on the other hand by the insufficiency of the rehabilitation of the elbow. We observed 8.7% superficial infection. This rate is relatively low, but higher than those of Ouzaa *et al.* [13] which find 4% but lower than that of Illical E M *et al.* [14] with 10%. We achieved 47.5% good functional results according to Mayo-clinic. Our results are well below the literature [4] [5] [12] [13] [14].

5. Conclusion

Fractures of the humeral palette are frequently accompanied by associated lesions. Joint fractures are the most common and often complex. The frequency of associated lesions makes treatment difficult with an unfavourable evolution.

Authors' Contributions

All authors contributed to this work. All authors also report having read and approved the final version of the manuscript.

Conflicts of Interest

Authors do not declare any conflict of interest.

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