International Journal of Academic Health and Medical Research (IJAHMR)
ISSN: 2643-9824
Vol. 8 Issue 4 April - 2024, Pages: 154-157

Surgical Treatment Of Humeral Palette Fractures In Adults

B. EBYELMEALY, A. TBATOU, H. MRANIALAOUI, J. RADI, K. LAHRACH, A. MARZOUKI, F. BOUTAYEB

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

Abstract*: Fractures of the humeral palette represent 1% of all adult traumatological pathology. We carried out a retrospective study in the Traumatology A Department of the HASSAN II University Hospital in Fez, over a 5-year period from January 2017 to January 2021, involving 39 patients treated surgically for fractures of the humeral palette. The mean age of the patients was 34.64 years (14-65 years), with an estimated male predominance of 69%, and the etiologies were dominated by falls and MVAs. The fractures were classified according to the Muller and Allogower classification, with type C predominating (48%), 51% of patients had associated lesions, with the skin opening predominating (25%), 87% of patients were treated surgically, while 13% were managed orthopedically. Twenty-five patients had a satisfactory result (64% excellent and good), based on Mayo Clinc criteria, with complications dominated by stiffness. Comparison of our results with those reported in the literature confirms the value of surgical treatment, which enables stable fixation and early rehabilitation.*

Keywords: humeral palette fracture by plate osteosynthesis

INTRODUCTION

Humeral palmar fractures are fractures located between the distal insertion of the anterior brachialis muscle and the elbow joint space, and are classified as fractures of the lower end of the humerus [1]. Fractures of the distal end of the humerus (FEDH) account for 1 to 2% of adult fractures according to Morrey [2], and may be extra- or intra-articular. In the latter case, they can be complex due to comminution and/or the porotic state of the bone. Their usual anatomical complexity has long conditioned the diversity of their treatment, and their management still remains very difficult [3]. While orthopedic treatment is still sometimes required for non-displaced fractures, or exceptionally for major fractures, surgery is now considered the preferred treatment. The most stable osteosynthesis possible should be preferred, to avoid disassembly and allow early mobilization, which is the only way to avoid elbow stiffness, the most frequent complication.

MATERIAL AND METHODS

We report a retrospective study of 39 cases of surgically treated fractures of the distal end of the humerus followed up at the Department of Orthopedic Surgery and Traumatology A of the HASSAN II University Hospital, Fez, over a 5-year period from January 2017 to January 2021. Patients were included in the study according to the following criteria: the occurrence of a fracture of the distal end of the humerus, non-pathological, in patients over 18 years of age.

RESULTS

Our patients ranged in age from 18 to 70 years. The overall mean age at onset of humeral fracture was 42 years. The study included 27 men (69%) and 12 women (31%). In our series, the affected side was the left side in 25 patients (59%). The most frequent cause of humeral palette fractures was falls, accounting for 49% of all 39 cases, followed by road accidents (43.5%) and assaults (7.5%).

All our patients presented to the emergency department with an upper-limb trauma attitude, with the elbow semi-flexed at 90°.

To classify the 39 cases of humeral pallet fractures in our study, we adopted the AO classification. It distinguishes pure articular and extra-articular fractures into 3 categories (A,B,C). A: extra-articular fracture, B: partial articular fracture, C: total articular fracture (Figure 1).

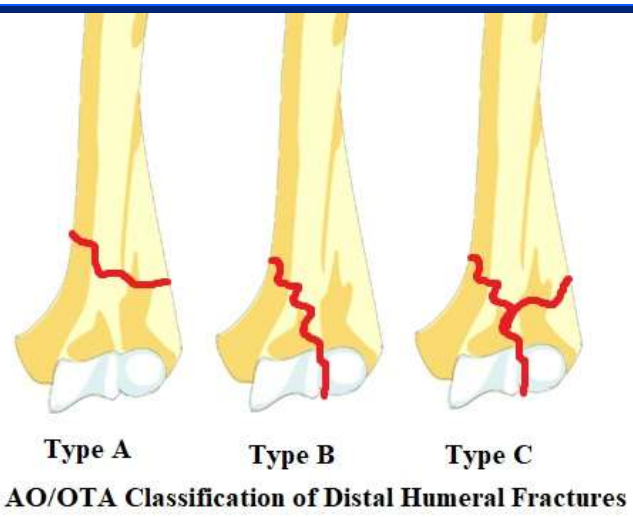

Figure 1: AO classification of humeral pallet fractures

Supra- and inter-condylar fractures predominate, accounting for 49% of cases in our series, followed by supra-condylar fractures (31%); while articular fractures are rarer, observed in only 20% of patients. All our patients were treated surgically via the posterior approach, with an osteotomy of the olecranon. LECESTRE plate fixation, either alone or in combination with other materials (a 1/3-tube plate and or screw fixation and or pinning), was used in all patients in our series.

Figure 2: Supra- and intercondylar fracture treated with a Lecestre-type plate.

Drainage and antibiotic prophylaxis were systematic in all patients, in addition to immobilization in a brachial-antbrachial plaster cast maintained for an average of 2 weeks until pain and inflammation subsided. No case of infection of the surgical site was observed in any of the patients in our series, although 1 case of paresthesia of the ulnar nerve may be explained by the extensive neurolysis. In our series, we found 07 cases of stiffness (17.9%), bearing in mind that the elbow is a joint that does not respond well to immobilization. Possible causes of stiffness include prolonged immobilization, fracture complexity or lack of rehabilitation. In our series, there were 6 cases of callus, i.e. 15.3% of cases. This was due to a failure to reduce complex fractures, as well as the difficulty of finding bony landmarks. There was 1 case of pseudarthrosis (2.5%). Post-traumatic osteoarthritis is the late scourge of any imperfectly reduced articular fracture; in our series, there were 5 cases of elbow osteoarthritis (12.8%).

Figure 3: Superior and intercondylar humeral pallet fracture treated with Lecestre inner abutment plate and tier tube outer abutment plate, and cable-stayed pinning to reduce the olecranon osteotomy.

DISCUSSION:

Most authors report in their series a clear predominance of the lesion in males. The study of the Scottish National Register provides very interesting epidemiological data [4], given the size of the population studied (595,000 people).

The overall incidence of distal humerus fractures was found to be 5.7/100,000/year, with a bimodal distribution: the first peak in incidence occurred in men aged 12 to 19, and the second in women over 80 (Figure 2). The mean age at fracture is 36.8 years (12-87) in men and 59.7 years (13-99) in women. There is a discrepancy between the results of different authors concerning the predominance of the right or left side. With regard to the circumstances of the trauma, we note the predominance of falls in our study, which is consistent with the etiologies of the other series. In all the series studied, supra- and inter-condylar fractures (type C) were the most frequent fractures of the humeral palette, followed by supra-condylar fractures (type A). Our results are therefore in line with those described in various series. The clinical appearance is that of a large, painful elbow, masking palpation of the classic normal landmarks: Hunter's line (line joining the olecranon to the epicondyles, elbow in extension) and Nélaton's isosceles triangle (skin surface determined by the respective positions of the olecranon and epicondyles, elbow in flexion [1].

Diagnosis is based on the analysis of frontal views of the elbow in extension and lateral views at 90° flexion. However, these images are often of poor quality, due to the very painful nature of the fracture, making it impossible to achieve correct orthogonal incidences in a patient immobilized in a splint. They are often repeated in the operating room [4]. CT scans are becoming increasingly routine, particularly for articular fractures. The anatomical complexity of the lower end of the humerus, the frequent comminution of these fractures, the proximity of the radial and ulnar nerves and the multiplicity of anatomopathological forms are all reasons why these fractures pose a real therapeutic problem for the trauma surgeon. While orthopedic treatment is sometimes the preferred option for non-displaced fractures, or exceptionally for major fractures, surgery is now considered the preferred treatment. The most stable osteosynthesis possible is preferred, to avoid disassembly and enable early mobilization, the only way to avoid elbow stiffness, the most frequent complication. Osteosynthesis using isolated pins or screws, or a combination of the two, has been progressively abandoned due to its precariousness, and since the consensus of the 1979 SOFCOT round table [5], screw-plate fixation has been recognized as the treatment of choice. However, the type and optimal location of plates remain a matter of controversy [5].

In our series, no case of infection was recorded, which is controversial with the majority of series studied: 5% in Raiss [6] and 8% in Lahdidi [7]. According to Jupiter, these infections may be due to the timing and duration of surgery, and the osteosynthesis modalities used (greater frequency of infection after plate osteosynthesis) [8]. Pseudarthrosis was observed in 2.5% of cases, compared with 5.1% for Nedellec and 3.6% for Raiss. In many cases, the main cause of pseudarthrosis is a less-than-rigid mounting. The nerve most frequently affected is the ulnar nerve, which is in line with our findings: 2 cases of ulnar nerve paresthesia. Raiss [8] described 8 cases of ulnar nerve damage, while OBERT [9] reported 6 cases. Ulnar nerve damage is due to its anatomy, which makes it particularly vulnerable in this region. Stiffness was found in 23.63% of cases in Raiss, 16% in Roques, 20% in Obert and 8% in Lahdidi. The frequency of stiffness in the majority of series remains notable; our series noted 07 cases of stiffness with a frequency of 17.9%. Our results were satisfactory in 85% of cases, a rate in line with those found by Jupiter (77%) and Saragaglia (68%), which confirms, in line with the literature, the value of surgical management of humeral palette fractures, whose functional prognosis depends on perfect anatomical restitution and early mobilization.

CONCLUSION

Common fractures of the humeral palette are becoming increasingly frequent due to the rising incidence of road accidents and their violence, and their management is complex.

The age-related prevalence of humeral palette fractures is almost identical.

Falls and MVAs are the main causes.

Supra- and intercondylar fractures are the most frequent.

The Lecestre plate is the osteosynthesis option of choice for supra- and intercondylar fractures ;

Stiffness remains the most dreaded complication of articular fractures of the humeral palette ; functional prognosis depends on perfect anatomical restitution and early mobilization.

Early rehabilitation is the only guarantee of a free elbow.

BIBLIOGRAPHY :

1. Cadot B, Da Silva Rosa R, Tawill HJ. Fractures de l`extremite inferieure de l'humerus : Techniques in Encycl Med Chir. Techniques chirurgicales-Orthopedie-Traumatologie ; 2003: 44-322.

2. Morrey BF. Distal Humeral Fractures Treated with Noncustom Total Elbow Replacement. J Bone Joint Surg Am. 2004 May; 86(5):940 -947.

3. Saragaglia D, Rouchy RC et Mercier N. Fractures de l'humérus distal ostéosynthésées par plaque Lambda ®: à propos de 75 cas au recul moyen de 9,5 ans. Revue de Chirurgie Orthopédique et Traumatologique. 2013;99(6):586-592.

4. Flouzat Lachaniette CH, Allain J. Traumatismes du coude. EMC – Radiologie et imagerie médicale : Musculosquelettique – Neurologique – Maxillofaciale, Paris : Elsevier 2011 ; 31-018-A10.

5. Sanders RA, Sackett JR. Open reduction and internal fixation of delayed union and nonunion of the distal humerus. J Orthop Trauma. 1990;4(3):254-9.

6. Raiss M, Hrora A, Moughils S, Mahfoud M, El Bardoum A, Oudghiri M, Elmanouar M. Fracture de la palette humérale chez l'adulte: a propos de 63 cas. Lyon chirurgical. 1995;91(5):397-400.

7. Lahdidi S. Le traitement chirurgical des fractures de la palette humérale à l'hopital Mohamed V. Thèse en médecine, Casablanca, N° 61, 2006.

8. Raiss M, Hrora A, Moughils S, Mahfoud M, El Bardoum A, Oudghiri M, Elmanouar M. Fracture de la palette humérale chez l'adulte: a propos de 63 cas. Lyon chirurgical. 1995;91(5):397-400.

9. Obert L, Ferrier M, Jacquot A, Mansat P, Sirveaux F, Clavert P et al. Distal humerus fractures in patients over 65: complications. Orthop Traumatol Surg Res. 2013 Dec;99(8):909-13.